

ORAL ARGUMENT NOT YET SCHEDULED

**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

**COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.**

Petitioners,

v.

**UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY**

Respondent.

No. 09-1322 and
consolidated cases

**COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.**

Petitioners,

v.

**UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY**

Respondent.

No. 10-1073 and
consolidated cases

**COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.**

Petitioners,

v.

**UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY**

Respondent.

No. 10-1092 and
consolidated cases

**SOUTHEASTERN LEGAL
FOUNDATION, ET AL.**

Petitioners,

v.

**UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY**

Respondent.

No. 10-1131 and
consolidated cases

**COALITION FOR RESPONSIBLE REGULATION, INC., ET AL.,
SOUTHEASTERN LEGAL FOUNDATION, ET AL.,
COMPETITIVE ENTERPRISE INSTITUTE, ET AL.,
LANDMARK LEGAL FOUNDATION, ET AL.,
AND
OHIO COAL ASSOCIATION**

MOTION FOR STAY

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ANPR	Advanced Notice of Proposed Rulemaking
AR	IPCC Assessment Report
BACT	Best Available Control Technology
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CEI	Competitive Enterprise Institute
CO ₂	Carbon Dioxide
CRR	Coalition for Responsible Regulation, Inc.
CRU	University of East Anglia Climate Research Unit
EAB	Environmental Appeals Board
EPA	U.S. Environmental Protection Agency
FIP	Federal Implementation Plan
GHG	Greenhouse Gas
GNPD	Great Northern Project Development
IPCC	Intergovernmental Panel on Climate Change
LLF	Landmark Legal Foundation
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NRC	National Research Council
NSPS	New Source Performance Standards
OCA	Ohio Coal Association
OSHA	Occupational Safety & Health Administration
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
RLBLC	RACT-BACT-LAER Clearinghouse
SIP	State Implementation Plan
SLF	Southeastern Legal Foundation
SO ₂	Sulfur Dioxide
USGCRP	U.S. Global Climate Research Program

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INTRODUCTION

These many cases challenge four U.S. Environmental Protection Agency (EPA) rulemakings that followed the Supreme Court's remand in *Massachusetts v. EPA*, 549 U.S. 497 (2007). Together, the rules comprise EPA's present strategy for regulating "greenhouse gases," and the most pervasive scheme ever undertaken in the name of the Clean Air Act (Act or CAA). As EPA Administrator Stephen Johnson warned in 2008, when considering his Agency's response to the *Massachusetts* remand, the "regulation of greenhouse gases under any portion of the Clean Air Act could result in an unprecedented expansion of EPA authority that would have a profound effect on virtually every sector of the economy and touch every household in the land." 73 Fed. Reg. 44,354, 44,355 (July 30, 2008). Because of choices since made by Administrator Johnson's successor, that day has arrived.

Pursuant to Rule 18 of the Federal Rules of Appellate Procedure, Coalition for Responsible Regulation, Inc. and its members (collectively, CRR);¹ Southeastern Legal Foundation and its co-petitioners (collectively, SLF);² Competitive Enterprise

¹ CRR, et al., are the Petitioners in Case Nos. 09-1322, 10-1073, 10-1092, and 10-1132.

² SLF's co-petitioners in Case Nos. 10-1035, 10-1083, 10-1094, and 10-1131, include U.S. Representatives John Linder (GA-7th), Dana Rohrabacher (CA-46th), John Shimkus (IL-19th), Phil Gingrey (GA-11th), Lynn Westmoreland (GA-3rd), Tom Price (GA-6th), Paul Broun (GA-10th), Steve King (IA-5th), Jack Kingston (GA-1st), Michele Bachmann (MN-6th), Kevin Brady (TX-8th), John Shadegg (AZ-3rd), Marsha Blackburn (TN-7th), and Dan Burton (IN-5th); The Langdale Company, Langdale Forest Products Company, Langdale Farms, LLC, Langdale Fuel Company,

Institute, FreedomWorks, and Science and Environmental Policy Project (collectively, CEI);³ Landmark Legal Foundation and Mark R. Levin (collectively, LLF);⁴ and Ohio Coal Association (OCA)⁵ respectfully request an order staying each of these rulemakings pending final disposition of the merits.⁶ This identical Motion is filed today in each of the four consolidated dockets.⁷

As explained below, the rules' ultimate restrictions take effect no later than January 2, 2011. The approach of that date already is disrupting capital investment, with direct consequences for jobs, energy security, and economic recovery. By letter dated September 7, 2010, CRR, CEI, SLF, and LLF asked EPA to consider a voluntary stay (Ex. 1), and OCA today filed a similar request (Ex. 2). Understandably,

Langdale Chevrolet–Pontiac, Inc., Langdale Ford Company, Langboard, Inc.–MDF, and Langboard, Inc.–OSB; Georgia Motor Trucking Association, Inc.; Collins Industries, Inc., and Collins Trucking Company, Inc.; Kennesaw Transportation, Inc.; J&M Tank Lines, Inc.; Southeast Trailer Mart, Inc.; and Georgia Agribusiness Council, Inc.

³ CEI, et al., are the Petitioners in Case Nos. 10-1045 and 10-1143.

⁴ LLF is the Petitioner in Case Nos. 10-1152 and 10-1208.

⁵ OCA is the Petitioner in Case Nos. 10-1040, 10-1126, 10-1144, and 10-1145.

⁶ CEI and LLF move only to stay those rules for which they have filed petitions for review, identified *supra* notes 3 and 4.

⁷ By separate “Motion to Reallocate or, Alternatively to Exceed Page Limits for Stay Motions,” filed September 3, 2010, CRR, et al., along with other Petitioners intending to seek stays, have asked the Court—in the interest of *reducing* its overall reading—for leave to file a single motion in excess of page limits instead of four separate motions that comply with the limits.

EPA has not yet replied, but ongoing and imminent irreparable harm (as well as the Court-ordered deadline for stay motions) compel this filing.

CRR is a non-profit 501(c)(4) corporation supported by members engaged in the extractive industries, agriculture, power generation, chemical production, and manufacturing. Its purpose is to prevent the misuse of executive powers premised on anthropogenic “climate change,” at least ahead of the public will to do so as expressed through duly enacted legislation.

Founded in 1976, SLF is a national public interest law firm and policy center that advocates limited government, individual economic freedom, and the free enterprise system in the courts of law and public opinion. SLF is a 501(c)(3) non-profit corporation that shares and promotes the public interest in the proper construction and enforcement of the laws and Constitution of the United States. In addition to legislative initiatives and programs designed to inform and educate the public, the organization’s attorneys represent plaintiffs in courts throughout the country to enforce laws advancing its interests.

CEI is a non-profit 501(c)(3) corporation organized for the purpose of defending free enterprise, limited government, and the rule of law. FreedomWorks is a non-profit 501(c)(4) corporation with over 870,000 members nationwide, organized for the purpose of promoting individual liberty, consumer choice, and competition. The Science and Environmental Policy Project is a non-profit 501(c)(3) corporation

organized for the purpose of promoting sound and credible science as the basis for regulatory decisions.

Founded in 1976, LLF is a public interest law firm committed to preserving the principles of limited government, separation of powers, free enterprise, federalism, strict construction of the Constitution and individual rights. Specializing in Constitutional litigation, Landmark maintains offices in Kansas City, Missouri and Leesburg, Virginia.

OCA is an unincorporated trade association dedicated to representing Ohio's coal industry. The Association is committed to advancing the development and utilization of Ohio coal as an abundant, economic, and environmentally sound energy source.

These organizations uniformly oppose EPA's arbitrary application of the Clean Air Act to a trace constituent of clean air.

The Clean Air Act is Not a Comprehensive Greenhouse Gas Control Act.

Before the Court for review are four inter-dependent EPA actions, taken in rapid succession, to regulate greenhouse gases (GHGs) under the CAA. EPA's regime rests on the first rulemaking at issue, in which its Administrator adopts the finding of the Intergovernmental Panel on Climate Change (IPCC) to the effect that anthropogenic GHG emissions endanger public health and welfare. 74 Fed. Reg. 66,496 (Dec. 15, 2009) (Endangerment Finding). EPA thus added to the CAA pantheon a new pollutant called "greenhouse gas," defined as "the aggregate group of

... six long-lived and directly emitted greenhouse gases: Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.” *Id.* at 66,536-37.

Because of that Finding, EPA next concluded that it should translate the latest iteration of Corporate Average Fuel Economy (CAFE) standards adopted by the National Highway Traffic Safety Administration (NHTSA) into corresponding tailpipe limits on this new “pollutant.” And so EPA and NHTSA jointly published a rule setting both new CAFE standards *and* limits on tailpipe emissions of GHGs that mimic compliance with those CAFE standards (because GHG emissions are directly proportional to fuel used), effective for Model Year 2012 cars. 75 Fed. Reg. 25,324 (May 7, 2010) (Tailpipe Rule).

But EPA did not stop with cars. In the third rulemaking, EPA announced its conclusion that its regulation of mobile source GHG emissions under Title II of the Act requires EPA also to subject *stationary* source GHG emissions to preconstruction permitting under the Title I Prevention of Significant Deterioration (PSD) preconstruction permit program and to the operating permit program under Title V. 75 Fed. Reg. 17,004 (Apr. 2, 2010) (Triggering Rule).⁸ More specifically, EPA

⁸ EPA did not arrive at this final rule by direct route. As explained in more detail in the preamble to the final Triggering Rule, a variety of administrative appeals involving PSD permits for specific projects had brought to EPA’s Environmental Appeals Board (EAB) the question of whether and when GHGs become “subject to regulation,” as that phrase is used in CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4). 75 Fed. Reg. at 17,004-06. The project opponents in those cases saw triggers for GHG-based

declared that this new air pollutant called “greenhouse gas” becomes “subject to regulation” throughout the Act on January 2, 2011, the first day on which it would be illegal to produce a car not meeting the Model Year 2012 standards. *Id.*

But the CAA is so poor a framework for GHG regulation that EPA ultimately admits the impossibility of applying some of its sections without having to violate others: The fourth and (to date) last link in EPA’s chain of regulation confesses the need to rewrite by regulation several unambiguous provisions of the Act in an effort to avoid “absurd” burdens on the public and the States, which EPA concedes that

PSD permitting in everything from the 1990 CAA Amendments’ imposition of GHG monitoring requirements on certain sources, to the *Massachusetts* decision in 2007, holding that carbon dioxide could fall within the definition of “air pollutant” under the CAA. *Id.* In an effort to communicate his position to the EAB and anyone else interested, EPA Administrator Johnson issued in 2008 a memorandum—later named for its author—expressing his view that PSD applies to any pollutant subject to “actual control” by virtue of a rule implementing the Act. *Id.* at 17,004.

In response to the Administrator’s decision to reject arguments based on other triggers (such as monitoring requirements), Sierra Club, Inc. petitioned for reconsideration, as well as for judicial review. *Sierra Club v. EPA*, No. 09-1018 (D.C. Cir. filed Jan. 15, 2009). After succeeding Mr. Johnson as EPA Administrator, Lisa Jackson granted reconsideration of the “Johnson Memo,” and undertook a notice and comment rulemaking process. 74 Fed. Reg. 51,535 (Oct. 7, 2009) (proposal). The final result of her reconsideration process is the “Triggering Rule” now before this Court, which is titled in the *Federal Register* as “Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting Programs.” 75 Fed. Reg. 17,004.

It is because of its genesis that the rule occasionally is given the rather awkward title of “Johnson Memorandum Reconsideration Rule.” It also has been called the “Timing Rule,” because it describes the timing by which EPA intends to add GHGs into the Act’s stationary source permitting programs, and the “Subject to Regulation Rule” because it sets forth EPA’s final position on when and how GHGs become subject to regulation.

Congress never intended. 75 Fed. Reg. 31,514 (June 3, 2010) (Tailoring Rule). This rule purports to reset the CAA-specified thresholds for permit applicability from 100 or 250 tons per year of any pollutant⁹ to 75,000 or even 100,000 tons per year for GHGs. *Id.* at 31,606 *et seq.* This same rule also overrides the mechanisms that Congress established to allow for orderly implementation of new permitting requirements by the States, which serve as the Nation's air quality permitting authorities. *Id.* at 31,579 *et seq.* (describing process by which EPA will “reinterpret” existing State laws as though they already treated GHGs as “subject to regulation”).

EPA has proposed (but not yet adopted) two further rules to circumvent the normal State Implementation Plan (SIP) process, which demonstrate the extent to which EPA is making this up as it goes along.¹⁰ The first proposed rule—assuming it is adopted in record time—would give States perhaps three weeks in December to respond to a call for revisions to their SIPs, or face a construction ban on January 2, 2011:

⁹ These thresholds are built into the definitions of “major emitting facility” and “major source” set forth at CAA §§ 169(1) and 302(j), 42 U.S.C. §§ 7479(1) and 7602(j), which establish the applicability of the PSD preconstruction permit program and Title V operating permit program, respectively. *See* CAA § 165(a), 42 U.S.C. § 7475(a) (requiring PSD permits for “major emitting facilities”) & CAA § 502(a), 42 U.S.C. § 7661a(a) (requiring Title V operating permits for all “major sources”).

¹⁰ A third rule, not yet even proposed, reportedly is on the way to patch up the Title V permit program: “We note that a number of states have a similar problem (i.e., that their title V programs do not apply to GHG-emitting sources.) We intend to address this issue through separate rulemaking.” 75 Fed. Reg. 53,892, 53,905 (Sept. 2, 2010). It remains to be seen what legal legerdemain EPA will use to make this additional “problem” disappear.

[F]or any State that receives a deadline after January 2, 2011, the affected GHG-emitting sources in that State...will be unable to receive a federally approved permit authorizing construction or modification. Therefore, after January 2, 2011, this source may not lawfully be able to construct or modify until the date that EPA either approves the SIP submittal or promulgates a FIP.

75 Fed. Reg. at 53,901 (proposed call for SIP revisions to adopt EPA GHG permitting program rules). This ax would fall not only on the thirteen States actually identified in the proposed SIP Call as having an “inadequate” SIP, but also on any others that EPA *later* determines to be inadequate, even if not identified in the proposed SIP Call. *Id.* at 53,895-96.

The second pending proposal would impose a Federal Implementation Plan (FIP) on States that fail to respond to the SIP Call, which again could befall each State in as little as three weeks after EPA has made a finding of SIP inadequacy. 75 Fed. Reg. 53,883 (Sept. 2, 2010). Among its many faults, this process comes nowhere close to complying with the Clean Air Act. *See* CAA § 110(k), 42 U.S.C. § 7410(k) (requiring EPA to allow a “reasonable time” for States to respond to SIP calls); CAA § 110(c), 42 U.S.C. § 7410(c) (requiring imposition of FIP within two years after State fails to meet its obligation to correct the deficiency within a reasonable time). In fact, as discussed below, Congress expressly and rightly provided around *five* years for new pollutants to be integrated into the PSD program.¹¹

¹¹ *See infra* at note 25 and accompanying text.

EPA of course does not confess that its schemes break the law, but admits at least that they strain it:

In view of the urgency of the task, which is to ensure that a PSD permitting authority for affected GHG sources is in place by January 2, 2011, we propose to give the final SIP Call an effective date of its publication date. We recognize that this process is highly expedited, but we believe that this is essential to maximize our and the States' opportunity to put in place a permitting authority to process PSD permit applications beginning on January 2, 2011, without which sources may be unable to proceed with plans to construct or modify.

75 Fed. Reg. at 53,900. This "urgent" need to "expedite" rule after patchwork rule to avoid shutting down industrial development does not bespeak a rational program; instead, it alerts this Court, as it should have alerted EPA, to some fundamental flaw in EPA's understanding of Congress' wishes.

As explained below, EPA is proceeding under interpretations of the CAA by which it could choose to regulate just about any human activity in the U.S., strictly or loosely or not at all, on whatever schedule it chooses. EPA's interpretation of its authority under the Act exceeds even the broad outer limits of the delegation doctrine. The immediate result of EPA's choices is a permitting program that imposes impossible obligations on the Nation's industrial base (and the States as permitting authorities), which EPA does not even try to justify with any quantifiable environmental benefits. Instead, EPA touts the "regulatory relief" afforded by the rule, the environmental costs of which are acceptable to EPA because they are too small to be quantified. 75 Fed. Reg. at 31,600. EPA's assertion of unbounded

regulatory power assesses an uncertainty tax across the entire U.S. economy, with productive enterprises unable to plan for EPA's next move because the Agency acts as though unconstrained by statute or definable objective, and because EPA's poor efforts to constrain itself—in the so-called “Tailoring Rule”—not only are self-imposed and so at best temporary, but also very unlikely to be upheld by this Court.

The Requested Stay Leaves In Place All Intended Emission Reductions.

With the arguable exception of the Tailpipe Rule, none of the four rules ties specifically expected GHG emission reductions to specifically demonstrated environmental consequences avoided: No GHG reductions directly result from the Endangerment Finding, and that Finding is not required as a legal predicate for the NHTSA CAFE standards; no marginal GHG reductions result from translating fuel economy standards into their GHG emission equivalents; and, most importantly, EPA fails to quantify any GHG reductions that would result from programs to require permits for stationary sources to emit GHGs. 75 Fed Reg. at 31,600. And the environmental “benefits” that EPA attributes to its Tailpipe Rule are not only imperceptible—saving one *one-hundredth* of a degree in average temperature increase and *one millimeter* in sea level rise over the course of the next *century*, 75 Fed. Reg. at 25,495—but will occur anyway from the improvements in fuel economy compelled by NHTSA under its separate statutory authority. EPA's Tailpipe Rule simply goes along for the ride. No Petitioner seeks to stay the CAFE standards, and so any GHG reductions intended by these rules will be retained.

But staying EPA's decision to translate CAFE standards into GHG limits will forestall all of what EPA Administrator Johnson described as the "profound" and "unprecedented" consequences of making GHGs subject to regulation under the CAA, at least until the Court has had the opportunity to adjudicate very substantial challenges to (1) the Finding on which EPA premised its Tailpipe Rule, (2) EPA's legal opinion that subjecting GHGs to regulation under Title II's mobile source control program requires permits from stationary sources under Titles I and V, and (3) the Agency's efforts to rewrite the plain language of the Act in order to accommodate its legal opinion. In any event, a stay of six or twelve months can hardly be said to be material to alleged harms for which even the direst forecasts are made in multi-decadal terms. *See* 74 Fed. Reg. at 66,514 ("the underlying science upon which the Administrator is basing her findings generally considers the next several decades—the time period out to around 2100, and for certain impacts, the time period beyond 2100").

A stay sacrifices none of the alleged benefits—there are none—but avoids all of the ongoing and irreparable harms associated with implementing EPA's regulatory scheme. Given the breadth of EPA's Endangerment Finding, which was not limited to the "greenhouse effect" attributable to vehicle emissions, the Finding is being used not only as the predicate for the Tailpipe Rules, but also for all manner of other

rulemakings and legal actions at the federal and State levels.¹² Each of these consumes public and private resources, and will need to be unwound if its underpinning—the Endangerment Finding—is later overturned.

¹² These proceedings fall into several classes.

The first encompasses further rulemakings under the CAA. Language similar to Section 202(a), 42 U.S.C. § 7521(a) is found throughout the Act, imposing obligations to regulate “pollution” that “endangers public health or welfare.” Each such mandate is now receiving the same attention as did Section 202(a) in the petition for rulemaking that lead to *Massachusetts*.

EPA has received numerous petitions asking for further rulemakings to limit GHGs for various other mobile sources under Title II, including (1) aircraft engines (including their emission of water vapor!), 73 Fed. Reg. at 44,460, (2) nonroad engines (including outdoor power equipment, recreational vehicles, farm and construction machinery, logging equipment, and small marine vessels), *id.* at 44,461, and (3) ships. *Id.* at 44,459. EPA inaction on those petitions has precipitated deadline-forcing litigation. *E.g.*, *Center for Biological Diversity v. EPA*, No. 10-CV-985 (D.D.C. filed June 11, 2010). According to EPA’s web site, a proposed rule limiting GHG emissions from heavy-duty trucks and buses reportedly is imminent. <http://yosemite.epa.gov/oepi/rulegate.nsf/byRIN/2060-AP61?opendocument> (Ex. 3).

Petitions also have been filed to demand rules for stationary sources, based on “endangerment” language similar to that used in Title II. For example, various petitioners have claimed that the endangerment language in CAA § 111, 42 U.S.C. § 7411, compels EPA to adopt New Source Performance Standards (NSPS) for a variety of industrial source categories, including power plants, petroleum refineries, and cement kilns. 73 Fed. Reg. at 44,399. Various lawsuits have been filed to force action on these petitions or to otherwise compel GHG limits in NSPS. *E.g.*, *New York v. EPA*, No. 08-1279 (D.C. Cir. filed Aug. 25, 2008) (challenging EPA failure to include GHG limits in refinery NSPS); *New York v. EPA*, No. 06-1322 (D.C. Cir. Sept. 24, 2007) (remanding power plant NSPS to consider effect of decision in *Massachusetts* case).

At least one rulemaking petition even seeks to force EPA to adopt a National Ambient Air Quality Standard (NAAQS) for GHGs. *See* Center for Biological Diversity, “Petition Establish National Pollution Limits for Greenhouse Gases Pursuant to the Clean Air Act” (Dec. 2, 2009) (Ex. 4). This Petition arises because the Act links EPA’s duty to set a NAAQS to a finding that a pollutant “endangers.” *See* CAA § 108(a)(1)(A), 42 U.S.C. § 7408(a)(1)(A). It would be difficult to overstate the

According to EPA, the Tailpipe Rule precipitates all of the unintended consequences for stationary sources; that is, EPA says the Act leaves it no choice but

consequences of a GHG NAAQS, which of course the whole Nation would fail to attain.

Another class of action is the State or regional rulemaking, many of which draw their substantive support from EPA's very broad Endangerment Finding. *E.g.*, New Mexico Environmental Improvement Board, Nos. 8-19(R) (filed Dec. 19, 2008) and 10-04(R) (filed June 4, 2010). In other cases, citizen groups are trying to use the Finding to compel State-level rulemaking. *E.g.*, *Public Citizen, Inc. v. Texas Comm'n on Envtl. Quality*, No. D-1-GN-09-002426 (Texas Dist. Ct., Travis County, filed Oct. 6, 2009).

Yet another class of action predicated on the Endangerment Finding is the environmental regulatory proceeding other than those pursued under the CAA, such as demands for Environmental Impact Statements under the National Environmental Policy Act (NEPA), 42 U.S.C. § 4332(2)(C). For example, relying principally on EPA's Endangerment Finding, an interest group seeking to stop the development of Powder River Basin coal reserves has petitioned the Department of the Interior to change the way that agency leases lands in the Basin. The group asserts the agency must certify the entire basin as a coal production region under the Mineral Leasing Act and conduct an environmental analysis of the alleged global warming impacts of GHG emissions from the burning of PRB coal by electric power generators across the U.S. *See* Petition of WildEarth Guardians, dated Nov. 23, 2009, at 3-4 (Ex. 10). The group also is attacking specific proposed lease sales in the Basin on the same grounds. *See WildEarth Guardians v. Salazar*, No. 10-cv-01174 (D.D.C. filed July 13, 2010).

The final class of legal action driven or sustained by EPA's Endangerment finding is the environmental tort case. Among those actions are *Comer v. Murphy Oil USA, Inc.*, 2007 WL 6942285 (S.D. Miss. 2007), *rev'd* 585 F.3d 855 (5th Cir. 2010), *appeal dismissed*, 607 F.3d 1049 (5th Cir. 2010), *pet. for mandamus filed*, No. 10-294 (U.S. Aug. 26, 2010) (claiming that GHG emissions from a variety of GHG-producing businesses exacerbated Hurricane Katrina); and *Connecticut v. Am. Elec. Power Co.*, 406 F. Supp.2d 265 (S.D.N.Y. 2005), *rev'd*, 582 F.3d 309 (2d Cir. 2009), *pet. for cert. filed*, No. 10-174 (U.S. Aug. 2, 2010) (claiming damage from GHGs emitted by various power producers). In the latter case, the Government now claims that the regulatory scheme at issue here displaces the federal common law (of nuisance) on which the underlying claims rely. *See* Brief for the Tennessee Valley Authority in Support of Petitioners (filed Aug. 24, 2010).

to require permits for stationary sources of GHGs once it has regulated tailpipe emissions of that same new “pollutant.” And so the Tailpipe Rule must be stayed to avoid those unintended consequences.

The Triggering and Tailoring Rules purport to impose on the States the obligation to immediately amend their permit programs in order to begin permitting GHG emissions. EPA is poised to use all manner of illegal tools to bend the States to its will, or to take over the States’ statutorily assigned role directly. Evident legal defects in the entire scheme now impose a terrible uncertainty tax on our struggling economy, as no business is able to make plans or investments in reliance on a regulatory scheme so clearly at odds with the plain language of the Act.

A Stay Serves the Public’s Interest in Orderly Policy-Making.

The law as envisioned and now created by EPA is not the product of considered policy-making. No branch of government—and certainly not the Nation’s elected representatives—set out by conscious design to create the piecemeal but pervasive regulatory programs at issue in these many pending cases.

The Legislative Branch: Congress unquestionably did not in 1970, or 1977, or even in 1990 make a conscious choice to regulate GHGs at all, much less through tailpipe limits, PSD reviews, or Title V permits at the thresholds or with the timing that EPA’s rules now require. EPA acknowledges that the CAA is “focused ... on sources of conventional pollutants and not global warming pollutants.” 74 Fed. Reg. 55,292, 55,304 (Oct. 27, 2009). When Congress intends to mandate comprehensive

EPA action in response to an issue of “air pollution,” we find that intent clearly expressed, in great detail, in entire subchapters of the Act, such as those governing local air pollution, air toxics, acid rain, and stratospheric ozone protection. In fact, the missing subchapter on “Greenhouse Gases” is *exactly* what Congress would have added to the Act were it to have enacted H.R. 2454 (111th Cong., 1st sess. 2009), called the “American Clean Energy and Security Act,” which passed the House last year, 219-212, but failed in the Senate.

The Executive Branch: Nor do the rules spring from considered policy-making by EPA to control emissions using the most efficient regulatory tools in pursuit of a specific environmental objective. EPA did not establish an environmental goal (such as a “safe” or desirable atmospheric level of GHGs); examine various means of achieving that goal; design from various options a sensible program to achieve that goal; and then present that program to the public for comment and refinement. *See Chevron, U.S.A., Inc. v. Natural Res. Defense Council Inc.*, 467 U.S. 837, 863-64 (1984) (“to engage in informed rulemaking, [an agency] must consider varying interpretations and the wisdom of its policy on a continuing basis”). Rather, EPA found endangerment without any finding of what levels endanger, either in terms of GHGs in the atmosphere or even of an environmental (e.g., temperature) endpoint, providing no way of knowing whether its program has succeeded, or even how much progress, if any, is made with each step.

Next, EPA adopted tailpipe limits, justified by the assertion that even trivial reductions are good reductions, again without any showing that the rule will yield meaningful progress toward a known “safe” level of atmospheric GHGs gases. Indeed, EPA disavows any obligation to provide that showing. 74 Fed. Reg. at 66,508 (“there is no basis to...read into the endangerment criteria an obligation that EPA show that the resulting emissions control strategy or strategies will have some significant degree of harm reduction or effectiveness in addressing the endangerment”).

EPA did not by deliberative process conclude that requiring permits of stationary sources of GHG emissions would yield defined benefits at sensible cost; rather, EPA says by interpretive rule that the law requires it to demand such permits as an ineluctable consequence of the Agency’s decision to regulate GHG emissions from cars. 75 Fed Reg. at 17,007. But while saying an Act that is silent about greenhouse gases compels greenhouse gas permits, EPA refuses to compel permits in the manner and from the sources that the Act, if applicable, explicitly would require. *Id.* at 31,514 (“This rulemaking is necessary because without it PSD and title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year (tpy) levels provided under the CAA, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the program.”). The Tailoring Rule goes on to set forth in great detail a schedule of declining thresholds and

timeframes for applying them that bear no resemblance to the straightforward obligations of the Act. *Id.* at 31,516 *et seq.* Still further rules are being prepared to fix the fixes.¹³

For all of EPA's trouble to pick which provisions of the Act it will obey and which it will disregard, the end result still is not a rational program. EPA cannot and does not ascribe any environmental benefits to regulating the stationary sources that are left in the permit programs or any environmental consequence to leaving others out. *Id.* at 31,600.

The Judicial Branch: Neither this Court nor the Supreme Court has mandated anything other than that carbon dioxide (and other GHGs) fall within the broad statutory definition of "air pollutants," and so EPA may consider whether GHGs "endanger" public health and welfare and are otherwise appropriate for regulation under the CAA. *Massachusetts*, 549 U.S. at 533. *Massachusetts* did not direct intrusive or pointless permitting programs for stationary sources; in fact, both the majority and dissenting opinions evidence the belief that the consequences of any endangerment finding would stop at tailpipe rules. *Id.* at 531-32 (Justice Stevens opining for the majority that EPA jurisdiction over GHGs would not lead to "extreme measures"); *id.* at 546-47 (Chief Justice Roberts' dissent) (observing that the "mismatch" between the petitioners' claimed injuries from catastrophic global warming and "the narrow

¹³ These pending proposals are briefly described *supra* at note 10 and accompanying text.

subject matter of the Clean Air Act provision at issue in this suit” would “suggest[] that petitioners’ true goal for this litigation may be more symbolic than anything else”).

A stay creates the opportunity for orderly disposition of legal challenges without any environmental consequences, while respectful of judicial, and the Nation’s, economy. If, as EPA itself asserts, it is “absurd” to regulate GHGs under the Clean Air Act as written, then all such regulations should be stayed. A stay will provide this Court the opportunity to assess whether the Act compels absurd regulation that accomplishes nothing but imposes impossible burdens, or whether there is a way to reconcile all provisions of the Act without absurdity.

In the meantime, the only actually intended emission reductions associated with these rulemakings—the tightened CAFE standards adopted by NHTSA under legal authority apart from the Clean Air Act—would remain in place to be implemented on the same schedule that NHTSA has proposed, while avoiding all of the unintended consequences that EPA first creates and then illegally and ineffectually struggles to avoid. In the unlikely event that the Court were to vindicate all of EPA’s actions, then they can be reinstated with no loss of any environmental benefits. In contrast, unwinding all of the collateral consequences of EPA’s rules, were they left intact for the next year of litigation, would be to unbake a cake.

ARGUMENT

In full recognition of the presumption favoring the validity of agency actions and of this Court's reluctance to stay them, still Movants submit that the circumstances here uniformly favor a stay. Behind all of EPA's actions is a finding "that elevated concentrations of greenhouse gases in the atmosphere may reasonably be anticipated to endanger the public health and to endanger the public welfare of current and future generations." 74 Fed. Reg. at 66,516. But even accepting EPA's claim as true, the rules will achieve (at best) infinitesimal changes in expected climatic outcome over the course of the next *century*, and so delaying progress toward that non-event for the duration of this litigation cannot possibly have any detectable adverse effect on anyone or anything. Finally, and most fundamentally, Movants do not seek to stay the rules that are said to achieve those benefits, as they will accrue in any event from the CAFE standards adopted by NHTSA.

While the alleged consequences of anthropogenic warming are being measured over a century and the contribution of U.S. sources in fractions of a percent, EPA's efforts to prevent them yield painful side effects already acutely felt by the regulated community, State and local governments, and the U.S. economy. Even now, permit applications must be filed to seek GHG limits, even though there are no State resources or rules available to govern those applications. *See infra* at notes 29-30 and accompanying text. Even now, the States must either announce their willingness to play by EPA's new rules, adopt new rules and hire new staff, or face a takeover of

their permit programs by a federal agency equally ill-equipped to process permits. 75 Fed. Reg. at 31,582; *see also supra* note 10 and accompanying text. Even now, no business can plan with any certainty concerning the permitting or control requirements facing capital projects. *See infra* at 61 *et seq.* Even now, many other governmental actions are being predicated on the EPA Endangerment Finding. *See supra* note 12. Even now, pending tort actions rely on the Endangerment Finding to establish liability. *Id.* By the time any of this can be undone by judicial review of each EPA rule in the ordinary course, our Nation's legal landscape will be forever and inalterably changed, and Petitioners will have suffered sizable losses for which there will be no adequate remedy.

We are now witnessing the fulfillment of predictions made by former EPA Administrator Johnson, who commissioned in the wake of *Massachusetts* a careful analysis of the collateral damage that would result from using the Clean Air Act as a weapon against alleged anthropogenic climate change. He published that analysis in the form of an Advanced Notice of Proposed Rulemaking, along with his own conclusions:

I believe the ANPR demonstrates the Clean Air Act, an outdated law originally enacted to control regional pollutants that cause direct health effects, is ill-suited for the task of regulating global greenhouse gases. Based on the analysis to date, *pursuing this course of action would inevitably result in a very complicated, time-consuming and, likely, convoluted set of regulations.* These rules would largely pre-empt or overlay existing programs that help control greenhouse gas emissions and *would be relatively ineffective at reducing greenhouse gas concentrations given the potentially damaging effect on jobs and the U.S. economy.*

73 Fed. Reg. at 44,355 (emphasis added). Administrator Jackson proceeded to issue her Finding in the face of these warnings.

“The purpose of a preliminary injunction is merely to preserve the relative positions of the parties” pending the outcome of litigation. *Chaplaincy of Full Gospel Churches v. England*, 454 F.3d 290, 297 (D.C. Cir. 2006) (citation omitted). “The factors to be considered in determining whether a stay is warranted are: (1) the likelihood that the party seeking the stay will prevail on the merits of the appeal; (2) the likelihood that the moving party will be irreparably harmed absent a stay; (3) the prospect that others will be harmed if the court grants the stay; and (4) the public interest in granting the stay.” *Wisconsin Gas Co. v. FERC*, 758 F.2d 669, 673-74 (D.C. Cir. 1985) (citation omitted). “These factors interrelate on a sliding scale and must be balanced against each other. ‘If the arguments for one factor are particularly strong, an injunction may issue even if the arguments in other areas are rather weak.’” *Serono Labs., Inc. v. Shalala*, 158 F.3d 1313, 1318 (D.C. Cir. 1998) (citation omitted).

It would be difficult to imagine circumstances more compelling for a stay than those presented by EPA’s patchwork quilt of GHG rules. As set forth below, Movants have abundantly demonstrated a likelihood of success on the merits, in part because one of the rules itself confesses that EPA’s regulatory program contravenes the plain language of the Act. Movants have demonstrated irreparable injury because their members will continue to suffer grave losses for which they cannot be

compensated. Conversely, it cannot seriously be maintained that anyone will suffer loss if EPA's four rules are stayed pending the outcome of this litigation: The NHTSA CAFE standards will go into effect regardless, and EPA has not even tried to quantify the GHG emission reductions to be achieved, much less the environmental benefit to be gained, with the rest of its new regime. Finally, a stay would allow time for Congress to either set in place GHG control laws, or to displace EPA's efforts to rewrite them, perhaps avoiding the need for this Court to intervene.

I. THERE IS A STRONG LIKELIHOOD THAT PETITIONERS WILL PREVAIL ON THE MERITS BECAUSE EACH LINK IN EPA'S CHAIN OF GHG REGULATION SUFFERS FATAL LEGAL WEAKNESSES.

In order to be granted its requested stay, Movants must demonstrate a likelihood of success on the merits. But in order "[t]o obtain injunctive relief, [they] need not establish an absolute certainty of success: '[I]t will ordinarily be enough that the plaintiff has raised serious legal questions going to the merits, so serious, substantial, difficult as to make them a fair ground of litigation and thus for more deliberative investigation.'" *Population Inst. v. McPherson*, 797 F.2d 1062, 1078 (D.C. Cir. 1986) (citation omitted). This Motion sets forth only some of the defects in each of the four challenged rulemakings. While Movants expect to prevail on the merits in their challenges to each rule, a stay would be warranted even if the Court does not find a likelihood of successful challenge to every rule, because they operate as an integrated whole. *See* 75 Fed Reg. at 53,895 ("In recent months, EPA has taken four related actions that, taken together, trigger PSD applicability for GHG sources on and

after January 2, 2011...”). Even EPA acknowledges, for example, that the stationary source permitting programs would be “absurd” if EPA were not allowed to “tailor” the Act. 75 Fed. Reg. at 31,517. Because removal of just one card would bring down the whole house, the likelihood of a successful challenge to any part equips the Court to stay the whole. *Cf. New Jersey v. EPA*, 517 F.3d 574, 584 (D.C. Cir. 2008) (“Severance and affirmance of a portion of an administrative regulation is improper if there is ‘substantial doubt’ that the agency would have adopted the severed portion on its own.”) (citation omitted).

A. The Endangerment Finding Proceeds from a Misapprehension of EPA’s Obligations Under Section 202(a).

EPA’s entire GHG program rests on the validity of its Endangerment Finding under Section 202(a) of the Act. This Finding suffers many flaws. We focus here on three:

1. EPA did not exercise its own judgment. EPA did not assess the science underlying its Endangerment Finding, but simply republished the assessments of other entities, unlawfully sub-delegating its statutory duties.
2. EPA misconstrued—and thus failed to make—the judgment required by Section 202(a) of the Act. EPA wrongly believed it could find endangerment without addressing the fundamental questions necessary to enable meaningful judicial review of that finding, leading to regulation unconstrained by the “reasonable limits” required by law. *See Ethyl Corp. v. EPA*, 541 F.2d 1, 18 n.32 (D.C. Cir. 1976).

3. EPA's scientific conclusions are irrational and unsupported by the record.

Applying an overly broad and illogical “precautionary” approach, EPA declined to confront and assess the many fundamental scientific uncertainties in the record, or to reconcile those uncertainties with its ultimate conclusions. According to EPA, so long as there is a non-falsifiable hypothesis of risk (here, that greenhouse gases can have a greenhouse effect), profound uncertainties about its extent and significance are irrelevant. This is bad science and bad law.

1. EPA Unlawfully Delegated its Statutory Judgment to Other Agencies.

Section 202(a)(1) of the Act requires the Administrator to promulgate standards when, “*in [her] judgment,*” an air pollutant emitted by motor vehicles causes or contributes to air pollution that may reasonably endanger the public health or welfare. 42 U.S.C. § 7521(a)(1) (emphasis added). Here, instead, “the Administrator ... rel[ied] on the major assessments of USGCRP, IPCC and NRC as the primary scientific and technical basis of her endangerment decision.” 74 Fed. Reg. at 66,510.¹⁴ EPA specifically *declined* to undertake “a new and independent assessment,” *id.* at 66,511, preferring to “plac[e] primary and significant weight on these assessment

¹⁴ Although EPA references the scientific assessments of the National Research Council (NRC) and the U.S. Global Climate Research Program (USGCRP), both of these agencies themselves relied heavily on the IPCC's AR4, particularly as it relates to the core scientific causation questions undermining the Endangerment Finding. At the end of the day, all paths lead back to IPCC. *See, e.g.,* 74 Fed. Reg. at 66,511; USGCRP June 2009 Report at 19-21 (available at downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf) (Ex. 5).

reports in making her decision on endangerment.” *Id.* EPA noted that the assessments by IPCC and others “address the scientific issues that the Administrator must examine for the endangerment analysis,” *id.* at 66,510, and because “EPA has no reason to believe” the assessment reports were not accurate, *id.* at 66,511, the Administrator chose to rely conclusively on them. But because the Administrator did not perform her “own assessment of all the underlying studies and information,” *id.*, she cannot confirm the accuracy, completeness, or objectivity of the assessments on which she relied. Nor can this Court, because the science and data assessed by IPCC—and the choices it made to accept or reject or weigh that science and data—are not in the administrative record.

This means that the only “judgment” EPA really made is that IPCC can be trusted to have made the endangerment assessment required by the Act. But the Act does not authorize entities other than EPA to make that assessment. *See, e.g., U.S. Telecom Ass’n v. FCC*, 359 F.3d 554, 565 (D.C. Cir. 2004) (“[F]ederal agency officials ... may not subdelegate to outside entities—private or sovereign—absent affirmative evidence of authority to do so.”). A federal agency may turn to third parties to gather facts or offer advice. *Id.* at 567-68. But the agency ceases to perform its own administrative function when it allows other parties to “make crucial decisions” about the application of statutory standards to specific circumstances and when it “rubber-stamps” other parties’ decisions “under the guise of seeking their advice.” *Id.* As this Court has warned,

when an agency delegates power to outside parties, lines of accountability may blur, undermining an important democratic check on government decision-making. Also, delegation to outside entities increases the risk that these parties will not share the agency's "national vision and perspective," and thus may pursue goals inconsistent with those of the agency and the underlying statutory scheme. In short, subdelegation to outside entities aggravates the risk of policy drift

Id. at 565-66 (citations omitted); *see also Nat'l Ass'n of Regulatory Utility Comm'rs v. FCC*, 737 F.2d 1095, 1143 n.41 (D.C. Cir. 1984) ("[O]ne of the rationales against excessive delegation [is] the harm done thereby to principles of political accountability. Such harm is doubled in degree in the context of a transfer of authority from Congress to an agency, and then from agency to private individuals."). Nor may the Administrator rely excessively on the factual conclusions of others, without "confront[ing] personally the essential evidence and arguments [supporting] the final standard." *United Steelworkers v. Marshall*, 647 F.2d 1189, 1217 (D.C. Cir. 1980).

This case illustrates the wisdom of this Court's caution in *U.S. Telecom Association*. "Primary and significant" reliance on the conclusions of others precludes confidence that those conclusions were reached with the "national vision and perspective" required by the CAA.¹⁵ There is no reason to believe that the individual IPCC assessment authors applied the standards that govern EPA decisions, and every reason to believe that other considerations—inconsistent with CAA standards—

¹⁵ As discussed in more detail below, an endangerment determination is informed by the relationship of the statutory term "endanger" to other provisions of the Act, and where the science is uncertain the determination "must . . . depend to a greater extent upon policy judgments and less upon purely factual analysis." *Ethyl*, 541 F.2d at 27, 29.

colored their decision-making. We now know, for example, that at least one IPCC assessment author, Dr. Murari Lal, included unfounded statements predicting the imminent demise of the Himalayan glaciers because “[w]e thought that if we can highlight it, it will impact policy-makers and politicians and encourage them to take some concrete action.” See David Rose, “Glacier Scientist: I Knew Data Hadn’t Been Verified,” *Daily Mail Online* (Jan. 24, 2010) (Ex. 6). The result-driven nature of the assessments ultimately led India to withdraw from IPCC, remarking that “[t]here is a fine line between climate science and climate evangelism” and that some IPCC authors had “misused the IPCC report.” Reconsid. Denial RTC 2-23 (Ex. 7). This is but one of many, many examples that illustrate the pitfalls inherent in off-shoring judgment, particularly to an entity whose very mission statement assumes the truth of the proposition under study.¹⁶

EPA in effect asks this Court, and the American public, to trust that IPCC did its job objectively, using the same rules of decision that govern valid rulemaking in this country. But neither this Court nor the interested public can determine whether

¹⁶ The role of the IPCC is “to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.” IPCC, *Memorandum on the Role of the IPCC and Key Elements of the IPCC Assessment Process* (Feb. 4, 2010), available at the following web site: www.ipcc.ch/pdf/press/role_ipcc_key_elements_assessment_process_04022101.pdf (Ex. 8).

IPCC in fact did so, because the innumerable choices made by its many authors are not in the record.

In fact, it took an anonymous release of materials from the University of East Anglia's Climatic Research Unit (CRU) in November 2009 to reveal how naïve was EPA's belief that it could rely on the unconfirmed analyses of foreign entities.¹⁷ These "Climategate" disclosures prove that IPCC's assessment of climate science was neither transparent nor objective. By way of example, Dr. Phil Jones, who co-authored portions of the IPCC assessment reports, stated in an e-mail that "I can't see either of these papers [contrary to the views of the IPCC authors] being in the next IPCC report," and vowed that "Kevin [Trenberth] and I will keep them out somehow—even if we have to redefine what the peer-review literature is!"¹⁸ At a minimum, these comments strongly suggest that important IPCC authors and contributors failed to apply "standards of quality based on objectivity, utility, and integrity," as EPA assumes. Although EPA now rallies to Dr. Jones' defense,¹⁹ EPA should not be in the position of having to defend IPCC authors in the first place:

¹⁷ The CRU provided IPCC with the historical temperature measures and temperature surrogates upon which IPCC based many of its critical findings. *History of the Climatic Research Unit*, [http: www.cru.uea.ac.uk/cru/about/history](http://www.cru.uea.ac.uk/cru/about/history) (last visited Sept. 10, 2010) (Ex. 9).

¹⁸ Reconsid. Denial RTC 2-27 (Ex. 7).

¹⁹ Reconsid. Denial RTC 2-27 (Ex. 7). *See also* 75 Fed. Reg. 49,556 (Aug. 13, 2010) (EPA notice denying Petitions to Reconsider based on "Climategate" materials).

Had EPA done its own work and rendered its own judgment, improper conduct by IPCC assessment authors would not be an issue.

By delegating its judgment, EPA also has insured that the climate science at issue is not in the record. Nor are the assumptions and standards informing the judgments of the IPCC authors. The net result is a scientific judgment made by IPCC, and then adopted by EPA, not supported by any record that this Court can review. This is error. *See, e.g.,* CAA § 307(d)(2)-(4), 42 U.S.C. § 7607(d)(2)-(4) (requiring EPA to include in the rulemaking docket “[a]ll data, information, and documents” upon which it relies); *Am. Radio Relay League, Inc. v. FCC*, 524 F.3d 227, 236 (D.C. Cir. 2008) (“[I]n order to allow for useful criticism, it is especially important for the agency to identify and make available *technical studies and data* that it has employed in reaching the decisions to propose particular rules.”) (citation omitted).

2. EPA Misconstrues—and so Fails to Make—the Judgment Required by Section 202(a).

Misconstruing *Massachusetts v. EPA*, EPA claims that

the Supreme Court decision held that EPA is limited to consideration of science when undertaking an endangerment finding, and that we cannot delay issuing a finding due to policy concerns if the science is sufficiently certain (as it is here) However, [the argument that CAA policy informs the judgment] ... ignores other language in the decision that clearly indicates that the Court interprets the statute to allow for the consideration only of science.

74 Fed. Reg. at 66,501. But the Supreme Court held only that EPA erred in concluding that carbon dioxide fell outside of an expansive statutory definition of “air pollutant,” *Massachusetts*, 549 U.S. at 528-32, and in assuming that it could decline to regulate without considering whether “the scientific uncertainty is so profound that it precludes ... a reasoned judgment,” *id.* at 534. The Court never said that EPA’s ultimate endangerment determination must be divorced from policy judgments. It cannot be: “Endangerment,” the statutory predicate for action, is not a scientific term with defined endpoints. It is not an objective measure, like the boiling point of water, but a value judgment, like “bad.” And so before EPA finds “endangerment,” it first must define it.

But EPA fails to do so. Its Finding is predicated on changes to “climate.” 74 Fed. Reg. at 66,497 (“The Administrator reached her determination by considering both observed and projected effects of greenhouse gases in the atmosphere, their effect on climate, and the public health and welfare risks and impacts associated with such climate change.”). “Climate” is simply “the combination of temperature, precipitation, winds, etc., characteristic of a locality or region over an extended period of time.” FUNK & WAGNALLS STANDARD COLLEGE DICTIONARY 254 (1977). This leads to a number of obvious yet unanswered questions: What levels of temperature, precipitation, or wind “endanger,” and why? What is a “safe” global temperature? Based on what criteria, for what populations, in what locations? What is a “safe” ambient concentration level of GHGs? Why? Most fundamentally, what level of

GHG yields acceptable climate conditions? Do car emissions contribute anything meaningful to the present level of GHGs in the atmosphere? Would their regulation under Section 202(a) fruitfully attack the alleged “endangerment”?

EPA either can’t answer these questions because it off-shored its judgment, or won’t answer them because it misapprehended its legal obligation to do so. The Agency wrongly limited its endangerment determination to identifying the existence of a theoretical risk, and failed in its duty to complete the analysis by establishing the facts that inform a rational policy (regulatory) response, if any. *Am. Lung Ass’n v. EPA*, 134 F.3d 388, 392 (D.C. Cir. 1998) (“Where ... Congress has delegated to an administrative agency the critical task of assessing the public health and the power to make decisions of national import in which individuals’ lives and welfare hang in the balance, that agency has the heaviest of obligations to explain and expose every step of its reasoning.”).

Contrast EPA’s Section 202(a) finding here with the one reviewed at great length and in great depth in *Ethyl*. In the finding ultimately upheld after searching inquiry (and even with some dissent) in *Ethyl*, EPA had first identified a specific risk to public health (impaired brain function) and the medical marker (blood lead levels) that it would use to evaluate the risk to public health, specifically explaining the relevance of blood lead as a measure of risk to brain function. 541 F.2d at 38-39. Next, it selected a blood lead level that correlated with an acceptable degree of brain function impairment, explaining why the selected level represented the level sufficient

to avoid “endangerment” and responding to comments that urged higher and lower levels. *Id.* at 38-40. EPA also considered evidence of the extent to which U.S. populations experienced blood lead levels above this “endangerment” level. *Id.* at 40-41. Next, EPA examined all exposure pathways that contributed to the total body lead burden, including but not limited to the ambient air. *Id.* at 41-46. Based on this analysis, EPA concluded that the airborne pathway was significant enough to warrant possible regulation. *Id.* at 42-47. Finally, EPA established that the regulation of lead levels in gasoline would meaningfully lower airborne exposure, in a way that would fruitfully attack the underlying danger. *Id.* at 55-65. By the end of the rulemaking, EPA had fully explained all of the choices it made along the path of converting available scientific knowledge about lead toxicology and exposure into a policy-based finding of endangerment from automotive lead emissions sufficient to justify regulation, and allow—and survive—judicial review.

EPA’s GHG endangerment finding, in contrast, jumps from the tautology that “greenhouse gases cause a greenhouse effect” to “greenhouse gases endanger public health and welfare sufficient to warrant exactly the level of GHG reductions that happen to result from NHTSA’s imposition of the CAFE standards required by the Energy Policy and Conservation Act.” It is as though EPA, in *Ethyl*, were defending a rule to ban leaded gasoline because lead is a poison at some unknown dose; cars burning leaded gasoline can emit lead, which has some unknown effect on atmospheric lead concentrations; and banning leaded gasoline would yield some

unknown but trivial reduction in atmospheric lead levels, possibly mitigating by some unknown (but at best trivial) degree the unknown adverse effects that may result from atmospheric lead, although it is very, very possible that the ban would accomplish absolutely nothing at all.

If anything, EPA should face a far *greater* burden to explain its policy choices here than it did in *Ethyl*. Lead is strictly a poison, whereas carbon dioxide is a natural component of clean air, ingested by all plants and exhaled by all animals. Life on Earth depends on the very “danger” that EPA is trying to prevent. 74 Fed. Reg. at 66,499 (“Greenhouse gases trap the Earth’s heat that would otherwise escape from the atmosphere, and thus form the greenhouse effect that helps keep the Earth warm enough for life.”). Lead in the atmosphere—unlike carbon dioxide—serves no public health or ecological function at all, much less as a vital link between and protector of all life on Earth. Carbon dioxide has been in the atmosphere at levels higher and lower than today’s throughout geologic history,²⁰ whereas lead has no place in the natural atmosphere. Brain damage from blood lead is an unequivocal harm, whereas “climate” is a neutral construct. It changes all the time, independent of human activity. What measure of climate—temperature, precipitation, wind speed—is the level at which public health and welfare is endangered? These necessarily are value judgments: Warmer temperatures benefit some and may hurt others; more or less rain helps some and hurts others.

²⁰ See, e.g., RTC 3-52, 3-53 (Ex. 11).

Yet EPA declines to make any such judgments about the competing costs and benefits of a changing climate, except arbitrarily. *See, e.g.*, 74 Fed. Reg. at 66,524 (“the Administrator has not established a specific threshold metric for each category of risk and impacts”) & *id.* at 66,529, 66,531-32 & 66,535 (acknowledging the research establishing various benefits of warming, but asserting without meaningful discussion, proof or quantification that the asserted harms outweigh such benefits). The Agency refused to make any effort to link the Endangerment Finding to its ability to eliminate or even reduce the danger by choosing to regulate under Section 202(a) of the Act. 74 Fed. Reg. at 66,516 (“it is reasonable to interpret the endangerment test as not requiring the consideration of the impacts of implementing the statute in the event of an endangerment finding as part of the endangerment finding itself”).

Ethyl demands “reasonable limits” on the risk evaluation and resulting policy response associated with an endangerment determination. 541 F.2d at 18 n.32. The emission standard compelled by any endangerment finding under Section 202(a) must be judicially reviewed under CAA § 307(d)(9), 42 U.S.C. § 7607(d)(9). Whether an emission standard is rational and therefore lawful, or is arbitrary and capricious and therefore unlawful, depends on (1) how EPA identifies and then weighs a particular risk, (2) the uncertainties associated with that risk, (3) the reasonableness of the burdens imposed by the regulatory response to the identified risk, and (4) the manner by which the risk is “fruitfully ... attacked” by the resulting regulatory response. *Ethyl*, 541 F.2d at 31 n.62; *see also Am. Lung Ass’n*, 134 F.3d at 392 (“[w]ith its delicate

balance of thorough record scrutiny and deference to agency expertise, judicial review can occur only when agencies explain their decisions with precision....”). Yet the record here offers nothing for the Court to judge, because EPA simply declares that IPCC has concluded that greenhouse gases “endanger,” and nothing more need be said to regulate, in any manner EPA chooses.

This is precisely the same erroneous interpretation of the law that OSHA made thirty years ago, leading the Supreme Court to invalidate workplace exposure limits on benzene that were based solely on feasibility, rather than meaningful mitigation of a quantified risk: “If the Government was correct in arguing that neither ... [statute] requires that the risk from a toxic substance be quantified sufficiently to enable the Secretary to characterize it as significant in an understandable way, the statute would make such a ‘sweeping delegation of legislative power’ that it might be unconstitutional” *Indus. Union Dep’t v. Am. Petroleum Inst.*, 448 U.S. 607, 646 (1980) (citation omitted). The Court further noted that the government’s position “would ... justify pervasive regulation limited only by the constraint of feasibility” and “would give OSHA power to impose enormous costs that might produce little, if any, discernible benefit.” *Id.* at 645. Same here.

An endangerment finding under Section 202(a) does not simply identify a health and welfare risk, as EPA contends; it also establishes the criteria that will inform whether the emission standards adopted to address that risk are rational. This is how “endangerment,” an undefined statutory term, requires the application of

science to law. *Ethyl*, 541 F.2d at 26 (the endangerment determination involves “essentially legislative policy judgments”). While science provides the facts that inform the judgment, EPA must make (and explain) its policy choices based on those facts to reach a value judgment of “endangerment.” *Ethyl*, 541 F.2d at 24 (“a determination of endangerment to public health is necessarily a question of policy”). EPA here failed to do so, first by rubber-stamping the IPCC’s findings instead of making its own assessment of the evidence, and then by disavowing any obligation to explain the various policy choices it made to reach its ultimate judgment and regulatory response. *Massachusetts* corrected EPA’s error when it refused to make any judgment on GHG science. We now ask this Court to correct EPA’s error in failing to identify, explain, and rationally support the policy choices it made when transmuting that science into law.

3. EPA’s Assessment of the Record is Logically Flawed.

EPA’s approach to assessing the record from which it found anthropogenic global warming fails on multiple fronts. First, as explained above, EPA did not evaluate its own record of direct evidence. It relied instead on assessments of the direct evidence made by other entities, particularly IPCC, leaving this Court to determine whether *the IPCC’s* conclusions withstand scrutiny under the CAA. That review requires “delv[ing] into the scientific literature” so as to “understand enough about the problem confronting the agency to comprehend the meaning of the evidence relied upon and the evidence discarded; the questions addressed by the

agency and those bypassed; the choices open to the agency and those made.” *Lead Indus. Ass’n v. EPA*, 647 F.2d 1130, 1145 (D.C. Cir. 1980) (citation omitted). None of that is possible here because the “evidence relied upon” and the “evidence discarded” and the “questions bypassed” by IPCC are not in the record.

A second problem with EPA’s adoption of IPCC assessments is that IPCC was not assessing the science in consideration of a specific regulatory response under the Clean Air Act. As a result, IPCC did not specifically confront and rationally explain how the substantial uncertainties in climate science affected any regulatory response. It is one thing to gather up evidence supporting the non-falsifiable and unremarkable hypothesis that greenhouse gases can have a greenhouse effect. It is quite another to explain why a particular regulatory response is rational in light of the totality of the science, both certain and uncertain. As this Court noted in *Ethyl*, “public health may properly be found endangered both by a lesser risk of a greater harm and by a greater risk of a lesser harm,” and “whether a particular combination of slight risk and great harm, or great risk and slight harm, constitutes a danger must depend upon the facts of each case.” 541 F.2d at 18 & n.32. Without meaningful consideration of the scientific unknowns, it is impossible to determine whether emissions of a particular pollutant present “a particular combination of slight risk and great harm, or great risk and slight harm.”

Presented with a non-falsifiable hypothesis of risk, the rationality of any regulatory response depends on the agency’s assessment of competing hypotheses and

the scientific uncertainties surrounding each one. If agencies are not required to confront and explain these countervailing considerations, then they become free to impose regulations based solely on “false dilemmas” and “arguments from ignorance.” *See, e.g.,* Hugh G. Gauch, Jr., *Scientific Method in Practice* 183 (2003) (“false dilemmas” acknowledge fewer alternative explanations than actually exist) (Ex. 12). Thus does correlation become confused with causation. *Id.* This case presents that very error.

i. EPA Created a “False Dilemma” by Meaningfully Evaluating Only One Possible Cause of Global Temperature Changes.

EPA reasons that because GHGs can have a greenhouse effect, and because the measured average temperatures considered by IPCC increased for several decades during a period of rising GHG concentrations, GHG emissions “very likely” caused the warming. 74 Fed. Reg. at 66,518. But this is a false dilemma, given the existence of other explanations for the warming; accordingly, the choice is not simply between concluding either (1) that anthropogenic GHGs caused warming, or (2) that there has been no warming. Instead, the proper scientific inquiry encompasses all possible causes of warming, natural and otherwise.

Correlation is never, by itself, proof of causation, especially where, as here, the record identifies many periods (including the last decade) during which GHGs and

temperature did *not* correlate.²¹ RTC 3-4 (“if a linear trend is fitted to annual global surface temperature data for the period 1998 to 2008, there is no real trend”) (Ex. 11). EPA attributes this lack of recent warming to “natural variability,” without identifying the natural mechanisms involved, and opines that this lack of warming is really just masking the underlying warming caused by GHGs. *Id.* So, according to EPA, warming is evidence of global warming, and lack of warming is evidence of global warming. Thus does EPA “prove” its theory that anthropogenic greenhouse gases are causing and will continue to cause “unnatural” warming by assuming its truth, and then summarily rejecting any contrary evidence or scientific hypotheses as “inconsistent with the assessment literature.” *See, e.g.*, RTC 3-3 (dismissing comments concerning anthropogenic emissions’ lack of influence on the climate as “inconsistent with the assessment literature”); 3-23 (same); 3-25 (same) (Ex. 11).

ii. EPA’s Arguments from Ignorance Could Rationalize Any Regulatory Action, and so Provide No Rationale at All.

Alternatively, EPA asserts that emissions of GHGs should be regulated as a precaution because it is not possible to prove that recent warming was *not* caused by increasing GHG concentrations. 74 Fed. Reg. at 66,506-07, 66,518 (acknowledging that it analyzed only “known” natural factors—“forcings”—that influence global temperatures). But this is simply an argument from ignorance, regulation as a

²¹ CRR, et al., Comments on EPA’s Proposed Endangerment Finding (June 22, 2009), at 25-29 (Ex. 13).

precaution without confirmation of causation. *Massachusetts* certainly did not call on EPA to regulate from ignorance. 549 U.S. at 534.

EPA adopts verbatim IPCC's judgment that "[i]t is extremely unlikely (<5 percent) that the global pattern of warming during the past half century can be explained without external forcing, and very unlikely that it is due to *known* natural external causes alone." 74 Fed. Reg. at 66,518 (emphasis added). But the caveat—that the assessment is based only on "known" natural causes—admits that warming may have been caused by *unknown* natural factors not yet understood. Unless these scientific uncertainties are confronted and assessed, it is irrational to draw any conclusion at a 95% certainty level.

Even a cursory review of the record demonstrates the irrationality of EPA's extraordinary level of confidence in anthropogenic GHGs as the deciding factor in temperatures over the last fifty years. IPCC's own Assessment Report (AR) explains that there are *three* principle influences on the climate system, listed in order of importance:

There are three fundamental ways to change the radiation balance of the Earth: 1) by changing the incoming solar radiation (e.g., by changes in Earth's orbit or in the Sun itself); 2) by changing the fraction of solar radiation that is reflected (called 'albedo'; e.g., by changes in cloud cover, atmospheric particles or vegetation); and 3) by altering the longwave radiation from Earth back towards space (e.g., by changing greenhouse gas concentrations). Climate, in turn, responds directly to such changes, as well as indirectly, through a variety of feedback mechanisms.

AR4 Chapter 1 at 96 (Ex. 14). Of these three factors, the sun is the most important: It provides all of the Earth's atmospheric energy. *Id.* at 96-97. According to IPCC, the influence of the sun lacks scientific consensus, leading to a "low" level of scientific understanding about the sun's overall effect on climate. AR4 Chapter 2 at 202 (Ex. 15). Second is the albedo effect, including from clouds, which controls how much solar energy is reflected back into space. AR4 Chapter 1 at 96 (Ex. 14). IPCC acknowledges "significant uncertainty" here, as well. AR4 Chapter 2 at 201 (Ex.15).²² Third and last, GHGs (the most predominant of which is water vapor) control how much heat is maintained in the atmosphere by radiating long-wave radiation back to the surface. AR4 Chapter 1 at 97 (Ex. 14). According to IPCC, the overall level of scientific understanding of the climate effects of GHGs is "high," with a scientific consensus about the physical mechanisms involved. AR4 Chapter 2 at 201 (Ex 15).

Of the three primary climate drivers, then, there is substantial *uncertainty* about the influence of the two most important. As to the third, GHGs, only a small fraction

²² EPA acknowledges that "[b]ecause cloud responses to climatic change are important for both the trapping and reflection of energy, ... clouds contribute to uncertainties in model-based results," RTC 4-3, and that "cloud modeling is important for accurately representing climate system and is subject to significant uncertainties." RTC 4-16 (Ex. 16). Still EPA never offers a reasoned explanation for how these "significant uncertainties" reconcile with the 95% certainty that it (like IPCC) assigns to GHG effects. *See also* Jason Scott Johnston, *Global Warming Advocacy Science: A Cross-Examination*, at 39-46, Research Paper 10-08, University of Pennsylvania Institute for Law and Economics (2010) (examining the IPCC's downplay of the significance of the substantial uncertainties in cloud feedbacks, even when it acknowledges those uncertainties) (Ex. 17).

of the atmospheric total is anthropogenic.²³ All airborne carbon dioxide, human and natural, comes to about 0.0385% of the atmosphere.²⁴ Yet IPCC and EPA irrationally conclude that it is “highly likely” (95%) that recent warming in the 20th century (but not prior episodes of equally rapid warming in the historical record) is caused by anthropogenic GHGs. The entire climate system, with its innumerable chaotic processes and influences and its undeniable history of constant natural cyclical variation, is posited to be controlled by a thermostat having only one knob, human emissions of GHGs. Both IPCC and EPA allow what they know about GHGs to trump what they do not know about the rest of the climate system, classic examples of reasoning by false dilemma and arguing from ignorance.

For an agency’s actions to be upheld, its “reasons and policy choices [must] conform to ‘certain minimal standards of rationality.’” *Nat’l Wildlife Fed’n v. EPA*, 286 F.3d 554, 559 (D.C. Cir. 2002) (citation omitted). EPA cannot, and does not, explain how its 95% certainty is justified on the record. There cannot simultaneously be both “significant uncertainty” about primary climate drivers and 95% certainty that anthropogenic GHGs are causing any observed warming, yet EPA concludes there is. This fails even minimal standards of rationality.

²³ Humans emit approximately 3.7% of all CO₂ released to the atmosphere. *See* AR4 Chapter 7 at 515 (Ex. 19). Anthropogenic sources are 8.0 GtC per year, natural sources 190.2 GtC per year.

²⁴ *See* Endangerment Finding TSD, § 2(c) 17 (Ex. 18).

B. The Tailpipe Rule Suffers Fundamental Legal Defects.

Movants seek a stay only of EPA's GHG Tailpipe Rule, *not* the CAFE standards promulgated by NHTSA under the Energy Policy and Conservation Act as a separate part of the same "joint Final Rule." 75 Fed. Reg. at 25,324. Therefore, the challenges to EPA's Tailpipe Rule under Section 202(a) in no way affect the fuel savings or GHG emission reductions attributed to NHTSA's new CAFE standards.

1. The Tailpipe Rule is Based Upon and Fatally Flawed by the Same Defects That Plague the Endangerment Finding.

EPA openly acknowledges that the Tailpipe Rule is premised on its Endangerment Finding. *See* 75 Fed. Reg. at 25,398-99. Therefore, the defects in the Finding deprive the Rule of the foundation required by Section 202(a).

2. EPA's Administrative Record Fails to Establish Any Non-Trivial Benefit to the Tailpipe Rule.

While Movants strongly contest the alleged effects of U.S. GHG emissions on global climate, even if correct, EPA admits that the Tailpipe Rule does effectively nothing about it. For example:

Based on the reanalysis the results for projected atmospheric CO₂ concentrations are estimated to be reduced by an average of 2.9 ppm ..., global mean temperature is estimated to be reduced by 0.006 to 0.015 °C by 2100 ..., and sea-level rise is projected to be reduced by approximately 0.06-0.14 cm by 2100....

75 Fed. Reg. at 25,495. As EPA later concedes, these estimated reductions are "small" relative to the "best estimates" for global mean temperature increases (1.8-4.0°C) and sea level rise (0.20-0.59m) projected for the Year 2100 in the absence of

the CAFE reductions. *Id.* “Small” is an overstatement: The absolute differences are barely one one-hundredth of a degree and perhaps a millimeter in sea level over the next one hundred years. “Imperceptible” would be a better term.

Regulatory actions of an administrative agency must “fruitfully attack” the problem being addressed. *See Ethyl Corp.*, 541 F.2d at 31 n. 62. Based on its record, the Tailpipe Rule clearly fails to “fruitfully attack” anthropogenic climate change. Even taking at face value EPA’s (incorrect) worst-case projections of temperature and sea-level changes, the Agency attributes at most a 0.3 percent marginal mitigation from applying the Tailpipe Rule to the U.S. automobile fleet.

A range of cases construing the CAA support the conclusion that it is not intended to address environmental consequences as trivial as those claimed for the Tailpipe Rules. For example, where some power plants’ emissions were modeled to cause an out-of-state impact of 1.5 percent of the National Ambient Air Quality Standards (NAAQS), EPA properly concluded that they did not “prevent attainment” in that other state, as proscribed by CAA § 110. *State of Connecticut v. EPA*, 696 F.2d 147, 163-165 (2d Cir. 1982) (“where the impact upon a nearby state of another state’s revision of its SIP is shown by the Agency to be so insignificant as to be fairly described as minimal, the EPA may approve that revision even where the affected state is not in compliance with the NAAQS”); *see also Air Pollution Control Dist. v. EPA*, 739 F.2d 1071, 1092-93 (6th Cir. 1984) (although not specifically incorporated into the CAA, the test intended by Congress is whether one state *significantly* contributes to

NAAQS violations in another state, and EPA rightly found that a contribution of 3 percent was not significant); *New York v. EPA*, 852 F.2d 574, 580 (D.C. Cir. 1988) (out-of-state source responsible for 20 percent of total impact did not significantly contribute to NAAQS violations). Similarly, this Court has upheld NHTSA's conclusion that the differences between two vehicle mileage standards were insignificant for purposes of the National Environmental Policy Act where the more stringent standard was projected to reduce emissions by 0.68 percent and gasoline-related cancer deaths by 0.24 percent. *City of Los Angeles v. NHTSA*, 912 F.2d 478, 487-88 (D.C. Cir. 1990), *overruled on other grounds by Florida Audubon Soc'y v. Bentsen*, 94 F.3d 658 (D.C. Cir. 1996).

3. EPA's GHG Tailpipe Limits Accomplish Nothing That the NHTSA CAFE Standards Do Not Already Accomplish.

The CAFE standards and EPA's Tailpipe Rule are virtually identical, with irrelevant differences in how the two standards address air conditioning. *See* 75 Fed. Reg. at 72,330 (“[The two standards] represent a harmonized approach that will allow industry to build a single national fleet that will satisfy both the GHG requirements under the CAA and the CAFE requirements under the EPCA/EISA.”). EPA cannot rationally conclude it will address endangerment by separately requiring the same reduction in emissions that another agency already has or is simultaneously eliminating. *See Bowen v. Am. Hosp. Ass'n*, 476 U.S. 610, 635-36 (1986) (rejecting certain Department of Health and Human Services anti-discrimination regulations

because, among other things, effective state level anti-discrimination programs were already in place); *NAACP v. Fed. Power Comm'n*, 425 U.S. 662, 673-74 (1976) (Burger, C.J., concurring) (Commission properly denied a petition for rulemaking that would have resulted in “the imposition of another layer of federal regulation of the same subject matter, with the inevitable potential for conflict between administrative agencies”); *Paralyzed Veterans of Am. v. Civil Aeronautics Board*, 752 F.2d 694, 713 (D.C. Cir. 1985) (finding “commendable” one agency’s decision not to issue regulations that would be redundant with another agency’s).

But EPA’s Tailpipe Rules are not just redundant: By establishing tailpipe standards under § 202(a) of the Act, EPA itself maintains that GHGs are now “subject to regulation” under a variety of other CAA programs, which has profound and pernicious effects throughout the American economy, beginning (but by no means ending) with much-expanded requirements for preconstruction permits and Title V permits. There is no rational basis for EPA to promulgate mobile source rules that do nothing more than reiterate other, independently effective legal requirements, and that offer no added environmental benefit but impose far-reaching and unintended costs on a source population (stationary sources) not even considered in the Endangerment Finding assessment.

C. The Triggering and Tailoring Rules are Illegal Solutions to a Legal Problem of EPA's Own Creation.

The Triggering Rule presents EPA's legal conclusion that the Act triggers an obligation to obtain permits for GHG emissions from stationary sources when EPA chooses to regulate GHG emissions from mobile sources, whereas the Tailoring Rule would alleviate that obligation for an arbitrary fraction of the supposedly affected source population *despite* the compulsion of the Act. In brief, EPA recognizes—under its view of the Act—that all sources which emit more than 100 tons per year of GHGs would need permits. 75 Fed. Reg. at 31,514. Because EPA's exorbitant construction of the Act would create a regulated universe with millions of sources, EPA uses the absurdity of its own reading of the Act to justify its own views about what Congress would have done had it actually intended GHGs to be regulated: The “Tailoring Rule” departs from the CAA's unambiguous thresholds and tailors the Act by setting cascading thresholds and timelines found nowhere in it. *Id.* at 31,606, *et seq.*

Of course no rule can be upheld if inconsistent with the plain language of the law that purports to authorize that rule. *Chevron*, 467 U.S. at 842-43 (“the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress”). This principle surely applies even more strongly where, as is the case with the Title V program, Congress expressly *forbade* EPA to depart from the major source thresholds. CAA § 502(a), 42 U.S.C. § 7661a(a) (“The Administrator may ... promulgate regulations to exempt one or more source categories (in whole or in part)

from the requirements of [Title V] if the Administrator finds that compliance with such requirements is impracticable, infeasible, or unnecessarily burdensome on such categories, except that the Administrator *may not exempt any major source* from such requirements.”) (emphasis added) & CAA § 302(j) (defining “major source” as one emitting 100 tons per year or more of any air pollutant).

1. EPA Could Have Avoided Absurdity with a Proper Reading of the Act.

EPA’s record includes only speculation that preconstruction permits for any source, even the largest, might have any environmental benefit. 75 Fed. Reg. at 31,600. EPA doesn’t even try to speculate that applying the Title V operating permit process to GHG emissions yields any environmental benefit. *Id.* at 31,599. Stated another way, EPA did not add GHGs to the Title I preconstruction permitting program or the Title V operating permit program as a positive or beneficial action justified by law, or policy, or a proper Regulatory Impact Analysis. Instead, EPA simply adopted tailpipe standards duplicative of NHTSA fuel economy standards, asserted that those duplicative rules require it to implement sweeping stationary source permitting regimes, and then played defense against a statute that would then otherwise impose “absurd” demands. EPA could have avoided these concededly absurd results had it simply adopted a natural reading of the Act in the first place. And because a reasonable interpretation that avoids absurdity was available, the Agency’s construction of the statute is arbitrary and capricious rulemaking. *Cf. Mova*

Pharmaceutical Corp. v. Shalala, 140 F.3d 1060, 1069 (D.C. Cir. 1998) (“In effect, the [agency] has embarked upon an adventurous transplant operation in response to blemishes in the statute that could have been alleviated with more modest corrective surgery.”).

(a) “Subject to regulation” means subject to regulation at the time of the CAA’s enactment.

Part C of the Act—its PSD provisions—was written solely to prevent significant deterioration with respect to two air pollutants regulated under the Act in 1977 (sulfur dioxide (SO₂) and particulate matter (PM)). And so it is no surprise that none of its provisions makes any sense as applied to emissions of GHGs:

- Section 161 applies to “prevent significant deterioration in each region ... designated pursuant to section 7407 ... as attainment or unclassifiable.” 42 U.S.C. § 7471. Of course there are no such regions for GHGs, nor are there likely ever to be: There are no NAAQS for GHGs, and so nothing to attain. And given GHGs’ uniform distribution in the global atmosphere, neither could there be any meaningful distinctions among “regions.”
- Section 162 contemplates different PSD increments depending on geography (e.g., special protections for national parks and other Class I areas). 42 U.S.C. § 7472. Again, this makes no sense as applied to a “pollutant” that exists in trace amounts in the natural atmosphere, uniformly distributed around the globe, regulated not for purposes of protecting visibility or health, but—unlike any other pollutant regulated under the CAA—for their purported influence on global temperatures.
- Section 163 establishes increments for SO₂ and PM only, not GHGs. 42 U.S.C. § 7473.
- Section 164 allows for redesignation of Class I areas, again a concept without relevance to GHGs. 42 U.S.C. § 7474.

- Section 165 is the permit program applicable to “major emitting facilities.” In addition to demonstrating that the proposed source will not violate PSD increments, the permitting authority also must find that “the proposed facility is subject to the best available control technology for each pollutant subject to regulation under this chapter....” CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4). Of course, the entire purpose of the Part in which this subsection is included is to prevent deterioration to bare compliance with the NAAQS, and so a permit program requirement interpreted to apply to GHGs (which have no NAAQS) would do nothing to advance those purposes.
- Section 166, 42 U.S.C. § 7476, instructs EPA how to handle the criteria pollutants other than SO₂ and PM that existed at the time of enactment (hydrocarbons, carbon monoxide, photochemical oxidants, and nitrogen oxides), the critical implications of which we address in detail below.
- Sections 167 (enforcement of permit requirements), 168 (preservation of prior laws) and 169 (definitions) have no substantive consequence. 42 U.S.C. §§ 7477-7479.
- Sections 169A and B relate to visibility protection, again an issue wholly unrelated to GHG emissions. 42 U.S.C. §§ 7491 & 7492.

In short, everything about Part C was drafted to govern emissions of the criteria pollutants regulated at the time of enactment, with detailed instructions on SO₂ and PM, and generalized instructions to adopt a PSD program for the other NAAQS of the time (hydrocarbons, carbon monoxide, photochemical oxidants, and nitrogen oxides). Nothing about Part C suggests an intent to apply PSD to anything other than criteria pollutants, or to pollutants that might be regulated in the future, after enactment. And so the phrase “subject to regulation under this chapter,” as used in Section 165(a)(4), can rightly be understood in its literal, present-tense sense, as applying to pollutants subject to regulation in 1977. Not only is that the natural

reading, but also the reading that fulfills the stated purposes of Part C, is consistent with all other provisions of that Part and its legislative history, and avoids the many absurdities that otherwise cause EPA to start “tailoring” the Act (including, but not limited to, the abnegation of the tonnage thresholds, as well as the railroading of the States into hurriedly changing their SIPs through dubious procedures). Any remaining doubts about this interpretation are dispelled by reading Section 166, which directly addresses how EPA should handle “Other Pollutants” under Part C.

(b) Before EPA can add a new pollutant subject to review under Part C, Section 166 requires EPA to undertake a rulemaking to create a PSD program appropriate to that pollutant.

Part C as enacted in 1977 addressed two of the six criteria pollutants with very specific instructions on preventing significant deterioration in areas attaining those standards. Congress left the others to EPA:

In the case of the pollutants hydrocarbons, carbon monoxide, photochemical oxidants, and nitrogen oxides, the Administrator shall conduct a study and not later than two years after August 7, 1977 promulgate regulations to prevent the significant deterioration of air quality which would result from the emissions of such pollutants. *In the case of pollutants for which national ambient air quality standards are promulgated after August 7, 1977, he shall promulgate such regulations not more than 2 years after the date of promulgation of such standards.*

And so Section 166 affirms two understandings gleaned from a proper whole-statute read of the rest of Part C: First, the PSD program was enacted in 1977 to apply to then-extant criteria pollutants only; second, any future application of Part C is limited to criteria pollutants.

EPA's rules sweeping GHGs into the Act's permitting programs simply because of their regulation under Section 202(a) could not more clearly violate Congress' instructions on how to handle "other pollutants" under Part C: Section 166(a) limits PSD to new criteria pollutants, and, as to those, it requires rules specific to that new pollutant to be developed within two years after adopting its NAAQS. Rules developed pursuant to Section 166(a) become effective a year after their promulgation. This one-year delay allows Congress an opportunity to review the rules before the States become required to implement them. 72 Fed. Reg. 54,112, 54,118 (Sept. 21, 2007) (citing H.R. Conf. Rep. 95-564, at 151 (1977), 1977 U.S.C.A.N. 1502, 1532). Each State then has 21 months to submit a revised SIP meeting those new requirements and EPA must approve or disapprove the revised SIP four months later. CAA § 166, 42 U.S.C. § 7476. Under the statutorily prescribed process, States have up to five years to accommodate new pollutants within their preconstruction permitting programs.²⁵ Under EPA's recent spate of rules, the States get maybe three weeks.²⁶

²⁵ To summarize the process described previously, the clock begins after the adoption of a new NAAQS. EPA then has two years to establish rules for handling that new criteria pollutant under the PSD program, with those rules becoming effective a year later. Conforming SIP revisions must be adopted by each State and approved by EPA within 25 months after EPA adopts the implementing rules, for a total elapsed time of about 5 years from adoption of the NAAQS.

²⁶ See *supra* note 11 and accompanying text.

(c) Adherence to the statute *avoids* absurdity and leads to sensible results.

EPA leans most heavily on *Alabama Power v. Costle*, 636 F.2d 323 (D.C. Cir. 1980), to support its claim of authority to adjust the statute to deal with the “impossibility” of applying the statutory thresholds to GHGs, creating “administrative necessity” for ignoring the plain language of the Act. 75 Fed. Reg. at 31,543. Indeed that case very usefully instructs EPA *not* to do exactly what it proposes to do with the regulation of GHGs: What *Alabama Power* tells us is that EPA cannot create its own administrative necessity by ignoring one provision of the Act, and then solve that manufactured necessity by ignoring another.

One of the PSD rule provisions at issue in *Alabama Power* would have defined “potential to emit” without consideration of controls applied to a source. 636 F.2d at 353. The Court examined the language of the statute through the lens of Congressional intent, statutory structure, and legislative history to conclude—despite its deference to EPA—that “potential to emit” must be determined “tak[ing] into account the anticipated functioning of the air pollution control equipment designed into the facility.” *Id.* at 353-55. EPA’s decision to determine “potential to emit” without considering the effect of emission controls inflated the number of sources subject to PSD review. *Id.* at 354-55. In order to solve this problem of its own making, EPA added a “tailoring rule” akin to the present one, exempting from PSD review any source with actual (controlled) emissions below 50 tons over year. *Id.* at

355-56. As does the present Tailoring Rule, this old attempt at tailoring ignored the very same specific 100/250 ton-per-year thresholds set by statute. As it does today, “EPA concede[d] that its exemption allowing sources and modifications under 50 tons per year to forego BACT and air quality assessment is an ‘expansion’ of the limited exemption provided in section 165(b) of the Act.” *Id.* at 356. EPA nonetheless tried to defend its tailoring of the statutory PSD thresholds in 1979 the same way it now tries 30 years later: “This ‘expansion’ is defended as reflecting EPA’s judgment that application to such sources of the full preconstruction review and permit process would not be cost-effective and would strain to the limits the agency’s resources.” *Id.* This Court should reject EPA’s latest effort at a tailoring rule for the same reason it did the earlier one: “EPA’s ‘expansion’ of the section 165(b) exemption falls well beyond the agency’s exemption authority.” *Id.*

EPA’s regulation of GHGs differs little from that found defective in *Alabama Power*: Having applied the Act to a “pollutant” under programs never intended for that “pollutant,” EPA is confronted with the need to undo the “absurd” results that follow by outright defiance of crystal-clear provisions of the statute, those setting forth the applicability thresholds. The far better—and only legal—choice instead is to avoid manufacturing overbreadth in the first place.

It makes no sense to conclude that a pollutant regulated for one purpose (tailpipe standards), from one category of sources (cars), under one title of the statute (Title II), based on one set of findings (under Section 202(a)), automatically must be

regulated for an entirely different purpose (permitting programs), under a totally different regulatory scheme (Titles I and V), when emitted from a wholly separate category of sources (stationary). In order to conclude that Congress might have intended such a random and arbitrary result, one should demand very explicit evidence of that intent in the words and structure and history of the statute. The words, structure, and history here instead all side with the common-sense reading of Section 165(a)(4).

Another advantage of leaving “other pollutants” to the processes described in the section actually captioned “Other Pollutants” is that it gives EPA the flexibility that its current forcings do not. Congress, in fact, was quite sensible about adding new pollutants to the PSD program. The Act’s permitting program, including area classifications, Best Available Control Technology (BACT) reviews, and so forth, made sense as applied to PM and SO₂, but not necessarily as to the other criteria pollutants (especially ozone, for which EPA still has not crafted any PSD program). And it might make no sense as applied to any unknown future pollutant, *viz.* GHGs.

Congress left EPA relatively free to fashion—by rule—a sensible PSD program for those unknown future pollutants. Consequently, EPA—in the unlikely event that it could justify and promulgate a NAAQS for GHGs—would have the freedom to craft a PSD program appropriate to GHGs. Section 166(c) tells EPA that it may choose some other means of technology-forcing appropriate to GHGs, which at least as of today are not really susceptible to “BACT.” Section 166(e) also could be

handy in that unlikely future, as it leaves EPA without the obligation to undertake any geographical classifications (pointless for globally uniform atmospheric gases such as GHGs). EPA arguably even could set the permitting thresholds at a sensible level, as Section 166(c) allows EPA to set “specific numerical measures against which permit applications may be evaluated.” Or, most logically of all, EPA could equally maintain that the tonnage thresholds in the definition of “major emitting facility” apply only to the pollutants regulated as of 1977.

Another major advantage of complying with the statute is that it allows for orderly implementation. As noted above, the Section 166 process—unlike the “glorious mess” resulting from EPA’s piecemeal efforts and strained readings of the Act²⁷—expressly allows time for EPA to announce its expectations by rule, for Congress to have a chance to consider EPA’s plans, for the States to amend their rules to conform, and for the SIP process to work as intended.

2. The Triggering and Tailoring Rules Treat the States as Vassals, Not As the Equal Sovereigns Contemplated by the Clean Air Act.

Both the Title I and Title V permit programs are meant for implementation by each State. *See* CAA § 101(a)(3), 42 U.S.C. § 7401(a)(3) (“air pollution control at its source is the primary responsibility of States and local governments”); CAA §

²⁷In remarks at an April 2008 hearing of the House Subcommittee on Energy and Air Quality, Congressman John Dingell (D-MI) famously described the likely outcome of efforts to regulate GHGs under the Clean Air Act as a “glorious mess.” WALL ST. J. Apr. 12, 2008, at A8 (Ex. 20).

502(d)(1), 42 U.S.C. § 7661a(d)(1) (requiring States to develop Title V program within three years after EPA issues rules governing the approvability of such programs). EPA assumes that it may command the inclusion of GHGs in each State's SIP-approved preconstruction and Title V permit programs. But the Title I construction permit programs apply only to criteria pollutants: Section 110(a)(2)(C) requires each State's permit program to mandate permits only for "modification and construction of any stationary source within the areas covered by the plan *as necessary to assure that national ambient air quality standards are achieved*, including a permit program as required in parts C and D...." 42 U.S.C. § 7410(a)(2)(C). EPA has no basis, then, to disapprove a State's permit program for failing to govern emissions of a pollutant for which there is no NAAQS. And Title V is intended solely to codify otherwise applicable requirements in permits issued to stationary sources. *See, e.g.*, 75 Fed Reg. at 31,600. No requirements applicable to stationary sources are created by an EPA decision to regulate mobile source GHG emissions. EPA, in short, lacks authority under the Act to compel any State permit program to govern GHG emissions. But even if it did...

(a) States must be given time to change their rules to conform to new EPA expectations.

EPA cannot retroactively change a SIP without following all applicable procedural requirements. The Act "requires the EPA, before modifying the SIP, to suggest proposed revisions to the state, which must then hold public hearings and

respond,” and “[i]f the EPA is dissatisfied with a SIP or a portion of it, then it must either initiate the process for revising the SIP or initiate the process for promulgating a new SIP that addresses the deficiencies in the earlier one.” *Concerned Citizens of Bridesburg v. EPA*, 836 F.2d 777, 779, 787 (3d Cir. 1987).

EPA assumes that a change in federal law—namely the adoption of the Tailpipe Rule—will or at least should automatically result in a new pollutant to be governed by State permit rules. That assumption runs into serious constitutional and statutory difficulties.

To begin with, no sovereign can delegate to another the ability to make its laws. The State must by some affirmative act ratify any changes in pollutants and applicability thresholds incorporated from federal laws before they become effective. For example, a State law incorporating EPA hazardous waste listings cannot be construed to incorporate future changes to those listings by EPA. *Ex parte Elliott*, 973 S.W.2d 737, 741 (Tex. App.-Austin 1998) (“We acknowledge that [the State statute] may be read to say that the legislature has delegated to the EPA the power to define hazardous waste ... and that definition may change from time to time at the will of the EPA without intervention by or guidance from the legislature. Such a construction would in fact place in doubt the constitutionality of this provision.”).

EPA’s demand also stumbles over at least three principal requirements of the governing federal statute. First, the Act requires all SIP revisions to be adopted only after notice and hearing. CAA § 110(l), 42 U.S.C. § 7410(l). It should go without

saying that the nearly infinite expansion of the States' PSD and Title V permitting programs to include GHGs with no State-level rulemaking at all would not satisfy that requirement.

More fundamentally, though, it is beyond EPA's power to ask this of the States, as EPA itself has not undertaken a proper rulemaking to add as a requirement for an approvable SIP any of the rule changes or "interpretations" it is now asking of the States: Many of the changes wrought by the Tailoring Rules were preceded by no proposal whatsoever, instead simply appearing in the final notice.²⁸ Accordingly, these rules fail minimum standards for proper adoption, and should be invalidated for that reason alone. *See* CAA § 307(d)(1)(J), 42 U.S.C. § 7607(d)(1)(J) (requiring formal rulemaking procedures in order to establish any requirement under the PSD program); *CSX Transp. v. Surface Transp. Bd.*, 584 F.3d 1076, 1081-82 (D.C. Cir. 2009) (rule was not "logical outgrowth" and notice was insufficient where notice of proposed rulemaking "requested comments on no particular issue at all" with respect to relevant provision of final rule). There is no reason that States or regulated entities "should have anticipated" that EPA would impose such requirements in the final rule.

²⁸ The final rule accomplishes all of its "tailoring" by use of a multi-column, complex definition of "subject to regulation." *See* 75 Fed. Reg. at 31,606 (final definition of "subject to regulation" to be codified as 40 C.F.R. §§ 51.166(b)(48) & 52.21(b)(49)). The proposed rule included no such definition at all. *See* 75 Fed. Reg. at 55,351 *et seq.* Had EPA issued a proper proposal of its intention to reinterpret SIPs with this new definition, interested parties would have been able to comment on its many defects, some of which are identified in this Motion.

See City of Waukesha v. EPA, 320 F.3d 228, 245 (D.C. Cir. 2003) (applying section 307(d)).

And even with proper notice and comment, EPA cannot lawfully have adopted any rule that directly and immediately changes State permit programs in any respect, much less to expand the reach of the program so far that even the promulgating agency deems it “absurd.” EPA’s authority to direct the requirements for approvable SIPs derives from Section 110, which allows States at least 18 months after proper adoption of new SIP expectations before requiring their implementation by the States. CAA § 110(k), 42 U.S.C. § 7410(k). “EPA may not run roughshod over the procedural prerogatives that the Act has reserved to the states.” *Bethlehem Steel Corp. v. Gorsuch*, 742 F.2d 1028, 1036 (7th Cir. 1984).

Finally, even conventional SIP revision processes would not suffice here: The law that governs the treatment of new pollutants under the PSD program allows 21 months after EPA undertakes a proper rulemaking to add that new pollutant. CAA § 166, 42 U.S.C. § 7476. EPA, of course, has undertaken no such rulemaking, nor allowed any time for each State to respond.

(b) The Tailoring Rule’s demands for “loyalty oaths” reflect complete disrespect for the States as sovereign and equal partners in the implementation of the Act.

The permitting programs of all States apply to pollutants that are “subject to regulation” under the Act. In the Tailoring Rule as adopted (but not as proposed), EPA included a definition of “subject to regulation” that spans several *Federal Register*

columns, and asked each State to report back to EPA by August 2, 2010, whether it would “interpret” its existing use of the undefined phrase “subject to regulation” in its longstanding permit rules to include every specific of EPA’s convoluted plans to regulate GHGs. 75 Fed. Reg. at 31,582. EPA is asking each State, in effect, to agree that when it developed permit programs for pollutants then “subject to regulation,” that was a slip of the pen, and what it meant to write down was the dozens of paragraphs and subparagraphs of new 40 C.F.R. § 51.166(b)(48), which just happen to mimic EPA’s choices for re-writing the Act. The CAA is intended to create a working partnership between the States and the federal government. *Bethlehem Steel Corp.*, 742 F.2d at 1036. If this attempt were allowed to work here, there would be little left of Clean Air Act federalism.

II. THE RULES IMPOSE AN UNCERTAINTY TAX ACROSS THE U.S. ECONOMY, AN IRREPARABLE HARM THAT CAN NEVER BE RECOVERED.

EPA’s actions cause harm to Movants’ members that is “both certain and great,” and irreparable because they have no mechanism for recovering compensation for the economic losses they are, and will be, incurring. *Wisconsin Gas Co.*, 758 F.2d at 674. Those harms include (1) obligations to obtain permits in the absence of programs to issue them; (2) opposition to projects based on application of the Endangerment Finding; and (3) lost business opportunities based on market uncertainties.

1. EPA Interprets the Act in a Way that has Imposed a Ban on New Construction.

EPA's rules prohibit construction of any project above its "tailored" GHG emission thresholds after January 2, 2011, unless the project has had its GHG emissions approved through preconstruction permitting. 75 Fed. Reg. at 31,606 (to be codified as 40 C.F.R. §§ 51.166(b)(48), (49)(iv) & (v)). In effect, this has imposed a construction ban: Given minimum one-year processing times for PSD permits,²⁹ any business that hoped to have a PSD permit for its intended project by January 2011 needed to have filed a complete application for it at least nine months ago, even before EPA adopted its rules announcing its expectations for States to start considering GHG emissions in PSD permits. Accordingly, EPA has created an impossibility of compliance, even if the States were today equipped to handle applications for PSD permits for GHG emissions.

And they are not. Many States have announced that their permit program rules need to be amended before they require GHG emissions to be considered. 75 Fed. Reg. at 53,895.³⁰ In many states, that task can't be completed by the end of this year,

²⁹ EPA estimates that a PSD permit takes at least one year from application to issuance. 75 Fed. Reg. at 31,535.

³⁰ It is not clear that those States which have announced legal readiness have considered the constitutionality of their decisions: Many of those states are relying on the assumption that EPA's decision to regulate GHGs automatically makes that pollutant subject to regulation under their own laws, without independent rulemaking action. *But see supra* at 58.

much less by the end of last year, which is when the rules needed to be in place in order to allow permit issuance before January 2, 2011.

Of course State permitting programs require more than just rules: In order to work, they need trained personnel, financial resources, and working guidance and processing systems. EPA's decision to launch GHG-based PSD permitting with just a few months' notice places impossible burdens on those systems. EPA itself projected catastrophic consequences in terms of money, time, and resources required for GHG PSD permitting under the statutory thresholds, including an increase in permit applications from an average of 280 per year to 82,000, \$22.5 billion per year in permitting costs, and delays in permitting of as much as ten years. 75 Fed. Reg. at 31,540, 31,557. Even those States willing to accept EPA's illegal demands will have a hard time—and in many cases an impossible time under State administrative laws—adopting their own Tailoring Rules. Consequently, even States that purport to accept GHG as a pollutant already subject to regulation under their permit programs will be unable to timely limit the program to cover only those sources “tailored” by EPA.

Even States that purport to be able as a matter of law to do exactly as EPA asks likely remain unable to do so as a matter of fact. EPA recognizes that, even *with* tailoring, permit program costs will increase by over 40 percent. 75 Fed. Reg. at 31,540. EPA for the first time demands that applicants demonstrate application of BACT, and that States approve those demonstrations, for a “pollutant” for which there are no end-of-pipe controls. For pollutants other than GHG, sources going

through a BACT demonstration can rely on a wealth of EPA information and guidance. For example, EPA has developed a technology clearinghouse, referred to as the RACT-BACT-LAER Clearinghouse (RBLC), which is a searchable database of control technology determinations. The RBLC, however, has no information whatsoever on GHGs. EPA has even suggested that “BACT” for GHG might be controlling the means of production itself, or at least analyzing alternative production technologies.³¹ That, obviously, is no straightforward exercise. The uncertainty regarding what BACT will be, and how it will be demonstrated for permitting purposes, is making project planning nearly impossible for the foreseeable future. *See* Decl. of Charles H. Kerr, ¶¶ 6-18 (Ex. 21).

Even for those projects seemingly left out of GHG permitting because of “tailoring” nonetheless must plan on being brought in. As discussed above, the

³¹ The Triggering Rule, for example, conveys EPA’s expectations that the permitting authorities should use GHG BACT determinations to dictate the means of production:

[T]he CAA BACT definition requires permitting authorities selecting BACT to consider the reductions available through application of not only control methods, systems, and techniques, but also through production processes, and requires them to take into account energy, environmental, and economic impacts. Thus, the statute expresses the need for a comprehensive review of available pollution control methods when evaluating BACT that clearly requires consideration of energy efficiency. The consideration of energy efficiency is important because it contributes to reduction of pollutants to which the PSD requirements currently apply and have historically been applied.

75 Fed. Reg. at 17,020.

Tailoring Rule is at high risk of being vacated as a usurpation of Congress' (and the States') power, and it is widely and justifiably believed that those who rely on it do so at their peril.

Finally, even if the GHG permit process could be successfully and timely navigated, the resultant permits still may be attacked by interest groups in Federal or State administrative and judicial review processes. The increasing likelihood of such challenges, and the resultant delays, also contribute to the uncertainty facing businesses planning new or modified projects.

The effects of the uncertainty created by EPA's regulatory scheme are well illustrated by the experience of CRR member Great Northern Project Development (GNPD), which is in the process of developing a coal-fired electric generation project in North Dakota. Declaration of Charles H. Kerr, ¶ 5 (Ex. 21). The uncertainties of GHG regulation caused GNPD to abandon its original design and shift to more expensive coal gasification technology. *Id.*, ¶¶ 6-8. EPA's rules will require GNPD to obtain from North Dakota a PSD permit covering GHGs in order to proceed with the project. *Id.*, ¶ 13. The uncertainties associated with that process, as described above, have caused and will continue to cause significant delay, increased costs that cannot be recouped, and difficulty in securing necessary financing and long-term contracts from purchasers of the electricity that would be generated by the project. *Id.*, ¶¶ 12-16. As a result, this project may be cancelled. *Id.*, ¶¶ 14, 16.

2. The Endangerment Finding is Being Used to Support Other Challenges to Project Development.

In addition to the uncertainties associated with obtaining CAA permits, capital projects are being delayed by other legal processes based on the Endangerment Finding. For example, CRR member Alpha Natural Resources, Inc. produces coal from leased Federal lands in the Powder River Basin of Wyoming and Montana, one of the most productive coal regions in the United States. Declaration of Michael R. Peelish, ¶ 5 (Ex. 22). As discussed above, *supra* note 12, NEPA actions based on EPA's Endangerment Finding are delaying development of these reserves, and create uncertainty for producers in the Basin.

The Endangerment Finding also is catalyzing many other petitions for rulemaking that affect Movants' members. For example, one group has petitioned EPA to issue NSPS to limit GHG emissions from concentrated animal feeding operations, such as those operated by members of CRR member National Cattlemen's Beef Association. *See* Humane Society of the U.S., et al., Petition (Sept. 21, 2009) at 61-67 (Ex. 23); *see also supra* note 12.

In addition, plaintiffs are seeking damages in nuisance cases that rely significantly on EPA's Endangerment Finding. For example, CRR member Alpha Natural Resources, Inc., was one of the defendants in *Comer v. Murphy Oil, USA*, described *supra*, note 12.

3. The Rules are Depressing Markets for CRR Member Company Products.

Finally, CRR members who produce and market coal and other minerals have been experiencing or are expecting to experience negative impacts on their markets and competitiveness as a result of the impending regulation of GHG emissions. For example, Alpha Natural Resources, Inc., one of the major suppliers of steam coal for electricity generation, has seen decreases in demand for steam coal attributable to the expected impacts of GHG regulation on its utility customers. Declaration of Michael R. Peelish, ¶¶ 11-12 (Ex. 22). The drop in demand negatively affects the profitability of the company and its revenues. *Id.*

CRR member Rosebud Mining Company is similarly affected by a reduction in demand and lower net income. Declaration of James R. Barker, ¶ 12 (Ex. 24). Rosebud also has delayed indefinitely any further investment to develop the majority of its steam coal reserves, resulting in no current return on the sunk investment costs in those reserves. *Id.*, ¶¶ 13-14 .

The members of CRR member Industrial Minerals Association – North America extract industrial minerals and process them using methods that necessarily emit significant amounts of GHG. Declaration of Mark G. Ellis, ¶¶ 13, 15 (Ex. 25). Most, if not all, of its members would be subject to PSD permitting under the statutory thresholds, and many face the prospect of regulation of their process emissions. *Id.* The nature of many of the processes used by these companies makes

reductions in GHG emissions infeasible except by reductions in output, which would negatively affect revenues and yield market share to foreign competition. *Id.*, ¶¶14, 16-17. The uncertainty about GHG regulation, including the possibility that thresholds will be lowered or that the Tailoring Rule will be set aside, has adversely affected these companies' planning and business operations. *Id.*, ¶ 15.

This uncertainty tax cannot be recovered or remedied by any process for receiving compensatory damages. The harm is accordingly irreparable. *See CSX Transp., Inc. v. Williams*, 406 F.3d 667, 673-74 (D.C. Cir. 2005) (disruption of rail service is irreparable harm where money damages would be inadequate or difficult to measure). For all these reasons, Movants have demonstrated sufficient irreparable harm to their members to justify a stay pending review of EPA's GHG regulatory scheme.

III. A STAY DELAYS NO BENEFITS OF REGULATION.

The third of the *Wisconsin Gas Co.* factors for granting a stay—"the prospect that others will be harmed if the court grants the stay"—weighs overwhelming in favor of one here. This Motion seeks no stay of the only rule that actually effectuates emission reductions, the NHTSA fuel efficiency requirements. Given EPA's unwillingness and inability to quantify any benefit to requiring permits for stationary sources of GHGs, no one could be harmed by the six- to twelve-month period during which those nonexistent benefits would be foregone. Accordingly, none of the

intended benefits of the rules will be lost during the stay period, and so no one will be harmed by the stay.

IV. A STAY WOULD ALLOW FOR RATIONAL POLICY DEVELOPMENT.

The fourth and final factor to be considered in adjudicating a stay motion is “the public interest in granting the stay.” *Wisconsin Gas Co.*, 758 F.2d at 674. A stay here respects the needs of each branch of government, perhaps allowing all branches to sway in the same direction on matters of GHG control policy. As noted in this Motion’s Introduction, the present state of affairs arrived by fits and starts, not design: The rules at issue are a consequence of Congress’ failure to add a “Greenhouse Gas Control” subpart to the Clean Air Act, the Supreme Court’s directive to EPA nonetheless to *consider* proceeding under one specific provision of the Act, and EPA—depending on one’s perspective—either making the most of a bad situation, or being given an inch and taking a mile. The 111th Congress evidently will adjourn unable to either ratify the current state of affairs or change it, but the 112th may be rather more willing to announce an opinion on behalf of the electorate. A stay would allow for the possibility that Congress finally will state its intentions to regulate GHGs under the Clean Air Act, or not, so that this Court will not have to speak for it.

Respectfully submitted this 15th day of September, 2010.

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was on this 15th day of September, 2010, served electronically through the Court's CM/ECF system on all registered counsel and by first-class mail on those counsel not registered as listed below:

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US 536035v.7

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EXHIBIT 1

**Letter from CRR, CEI, SLF,
and LLF to EPA dated Sept. 7,
2010 concerning voluntary stay**

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THE LAW OUT WEST®



Paul D. Phillips
Phone (303) 295-8131
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September 7, 2010

**VIA OVERNIGHT MAIL &
FACSIMILE (202-501-1450)**

Honorable Lisa Jackson
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: Application for Stays of EPA's Endangerment Finding, 74 Fed. Reg. 66,496 (Dec. 15, 2009); Timing Rule, 75 Fed. Reg. 17,004 (Apr. 2, 2010); Tailpipe Rule, 75 Fed. Reg. 25,324 (May 7, 2010); and Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010)

Dear Administrator Jackson:

The Coalition for Responsible Regulation, Inc., directly and on behalf of its members, including Industrial Minerals Association-North America, National Cattlemen's Beef Association, Great Northern Project Development, L.P., Rosebud Mining Company, and Alpha Natural Resources, Inc. (collectively, the "Coalition"); the Competitive Enterprise Institute, FreedomWorks, and the Science and Environmental Policy Project; the Southeastern Legal Foundation, Inc.¹; and the Landmark Legal Foundation and Mark R. Levin (collectively, these "Petitioners") request the United States Environmental Protection Agency ("EPA" or the "Agency") to promptly issue a

¹ Southeastern Legal Foundation, Inc., and U.S. Representative John Linder (GA-7th), U.S. Representative Dana Rohrabacher (CA-46th), U.S. Representative John Shimkus (IL-19th), U.S. Representative Phil Gingrey (GA-11th), U.S. Representative Lynn Westmoreland (GA-3rd), U.S. Representative Tom Price (GA-6th), U.S. Representative Paul Broun (GA-10th), U.S. Representative Steve King (IA-5th), U.S. Representative Jack Kingston (GA-1st), U.S. Representative Michele Bachmann (MN-6th), U.S. Representative Kevin Brady (TX-8th), U.S. Representative John Shadegg (AZ-3rd), U.S. Representative Marsha Blackburn (TN-7th), U.S. Representative Dan Burton (IN-5th), The Langdale Company, Langdale Forest Products Company, Langdale Farms, LLC, Langdale Fuel Company, Langdale Chevrolet - Pontiac, Inc., Langdale Ford Company, Langboard, Inc. - MDF, Langboard, Inc. - OSB, Georgia Motor Trucking Association, Inc., Collins Industries, Inc., Collins Trucking Company, Inc., Kennesaw Transportation, Inc., J&M Tank Lines, Inc., Southeast Trailer Mart, Inc. and Georgia Agribusiness Council, Inc.

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stay pending judicial review of the following rules relating to greenhouse gases ("GHGs"):

1. EPA's finding under Section 202(a) of the Clean Air Act that greenhouse gases endanger public health and welfare, 74 Fed. Reg. 66,496 (Dec. 15, 2009) ("Endangerment Finding"), the subject of a Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 09-1322 (D.C. Cir.);
2. EPA's rule announcing its conclusion that its separate decision to regulate greenhouse gas emissions from vehicles means that stationary sources will require permits based on their greenhouse gas emissions starting on January 2, 2011, 75 Fed. Reg. 17,004 (Apr. 2, 2010) ("Timing Rule"), the subject of a Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 10-1073 (D.C. Cir.);
3. EPA's decision to enact limits on automobile tailpipe emissions of GHGs beginning with model year 2012 cars, 75 Fed. Reg. 25,324 (May 7, 2010) ("Tailpipe Rule"), the subject of a Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 10-1092 (D.C. Cir.); and
4. EPA's rule intended to adjust the permit requirements set forth in the language of the Clean Air Act in an effort to avoid the "absurd results" that flow from the statutory construction expressed by the Agency in these other three rules, 75 Fed. Reg. 31,514 (June 3, 2010) ("Tailoring Rule"), the subject of a Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 10-1132 (D.C. Cir.).

These Petitioners do not challenge the National Highway Traffic Safety Administration ("NHTSA") CAFE mileage standards promulgated simultaneously with (and duplicative of) the Tailpipe Rule, and request that the stay be limited to allow the NHTSA CAFE standards to take effect as scheduled.

The Coalition is a 501(c)(4) non-profit corporation supported by members engaged in the extractive industries, agriculture, power generation, chemical production, and manufacturing. The Competitive Enterprise Institute is a non-profit 501(c)(3) corporation organized for the purpose of defending free enterprise, limited government, and the rule of law; FreedomWorks is a non-profit 501(c)(4) corporation organized for the purpose of promoting individual liberty, consumer choice and competition; and the Science and Environmental Policy Project is a non-profit 501(c)(3) corporation organized for the purpose of promoting sound science as the basis for regulatory decisions. The Southeastern Legal Foundation, Inc. ("SLF") is a national public interest law firm and policy center that advocates limited government, individual economic freedom, and the free enterprise system in the courts of law and public opinion. SLF is a 501(c)(3) non-profit corporation that shares and promotes the public interest in the proper construction and enforcement of the laws and Constitution of the United States. The Landmark Legal Foundation is a non-profit 501(c)(3) corporation



organized for the purpose of preserving and applying anew the constitutional principles on which America was founded.

EPA has authority to issue the requested stay pursuant to 5 U.S.C. § 705, providing that “[w]hen an Agency finds that justice so requires, it may postpone the effective date of action taken by it pending judicial review.” This is a case where the interests of justice require postponing the effective dates of all four of these rules pending judicial review, for the following reasons:

1. EPA’s GHGs Rules Are Legally Deficient and Unlikely to Survive Judicial Review.

EPA’s Endangerment Finding, from which the Tailpipe, Timing and Tailoring Rules derive, was based upon a fundamentally flawed rulemaking process which in turn resulted in fatal procedural and substantive defects in that Finding. These substantive and procedural defects are laid forth in detail in the Coalition’s Comments and Supplemental Comments on the Endangerment Finding, which are incorporated herein by reference, and can be found in EPA’s Endangerment Docket (Docket ID No. EPA-HQ-OAR-2009-0171). More specifically:

a. EPA did not independently assess the science underlying its Endangerment Finding, instead simply repeating the assessments of other entities, particularly the IPCC, thereby unlawfully sub-delegating EPA’s statutory duties without Congressional authorization. This unlawful delegation of decision-making authority to third parties who were neither subject to the substantive requirements of the Clean Air Act nor to the disclosure/open records obligations of American law not only tainted the entire public review and comment process, but also was in direct violation of EPA’s obligations under Section 202 of the Clean Air Act and applicable case law. *See, e.g., U.S. Telecom Assn. v. FCC*, 359 F.3d 554, 565 (D.C. Cir. 2004). (“Federal agency officials . . . may not sub-delegate to outside entities – private or sovereign – absent affirmative evidence of authority to do so.”)

b. EPA misconstrued and thus failed to make the judgments required under Section 202(a) of the Clean Air Act, rendering its Endangerment Finding unconstrained by any “reasonable limits,” contrary to the Act and applicable case law. *See, Ethyl Corp. v. EPA*, 541 F.2d 1, 32 (D.C. Cir. 1976). In finding that anthropogenic GHGs “endanger” public health and welfare while failing completely to define what level of GHGs in the atmosphere “endanger” or what specific harms avoided or benefits achieved will be accomplished by EPA’s regulation of GHGs, EPA has in effect promulgated a standardless standard, and stretched the precautionary principal beyond its breaking point. This is the same kind of erroneous interpretation of the law that caused the Supreme Court to invalidate workplace exposure limits in *Industrial Union Dept. v. American Petroleum Inst.*, 448 U.S. 607, 646 (1980).



c. EPA's scientific conclusions were incomplete, conclusory, logically flawed, and lacking in basic rationality. The unscientific and result-driven analysis and conclusions which EPA followed in making the Endangerment Finding fall short of the legal requirement that, for an Agency's actions to be upheld, its "reasons and policy choices [must] conform to 'certain minimal standards of rationality.'" *National Wildlife Federation v. EPA*, 286 F.3d 554,559 (D.C. Cir. 2002).

d. EPA failed to conduct any of the economic evaluation, assessment of cost and benefits, and other analysis required under the Clean Air Act. *See, e.g.*, Section 202(a)(1) and (2).

EPA's Tailpipe, Timing and Tailoring Rules triggered by EPA's Endangerment Finding are likewise legally defective in at least four ways:

- a. All are predicated on the deeply flawed Endangerment Finding.
- b. The Tailpipe Rule creates a single standard for multiple pollutants, including pollutants not found in vehicle emissions.
- c. All fail to quantify any health and welfare benefit to the rules.
- d. The Timing and Tailoring Rules fail to consider the cost or benefit caused by stationary source regulation of GHGs.

The pervasive lack of rational basis for the regulatory scheme created by this web of defective rules is highlighted by EPA's open admission that the so-called Tailoring Rule is necessary because otherwise the plain language of the Clean Air Act mandates "absurd" results from application of EPA's GHG rules. 75 Fed. Reg. at 31,514.

2. No Environmental Harm or Detriment Would Result From Staying EPA's GHG Rules and a Stay Would Benefit the Public Interest.

Nothing in the hundreds of pages of preamble and regulations that EPA has promulgated under its four GHG rules ties any specifically expected GHG reductions to specifically demonstrated environmental benefits. Nowhere does EPA even attempt to determine by how much worldwide concentrations of GHGs will be reduced by its GHG rules; neither does the Agency try to describe the extent to which the adverse consequences speculated about in the Endangerment Finding would be avoided or mitigated by its rules. In fact, EPA expressly disavows any need or obligation to do so. 74 Fed. Reg. at 66,507. To the extent the Tailpipe Rule attempts to do so, even this is illusory and provides no basis for denying a stay, because:



a. EPA's GHG tailpipe emission limits are merely duplicative of the NHTSA CAFE mileage standards, which are not being challenged by these (or any other) Petitioners in these proceedings; thus, whatever environmental benefits can be attributed (wrongly or rightly) to the Tailpipe Rule already will occur under that separate legal requirement; and

b. EPA itself can attribute "benefits" to the tailpipe limits no greater than moderating temperatures by **one one-hundredth** of a degree Centigrade and **one-tenth** of a centimeter in sea level rise, **over a 100-year period**. 75 Fed. Reg. at 25,495. Such infinitesimal "benefits" over such a long period are far below natural fluctuations in these complex global-scale natural systems, and well within the error band of any currently-available predictive modeling or measurement systems.

It also bears emphasizing that the stay being requested here is for the roughly 6-12 months to allow the D.C. Circuit to consider and rule on the challenged regulations in an orderly fashion. Such a stay can hardly be said to be material or detrimental, when the alleged harms occur (at worst) over vast time spans. *See*, 74 Fed. Reg. at 66,514 ("[t]he underlying science upon which the Administrator is basing her findings generally considers the next several decades – the time period out to 2100, and for certain impacts, the time period beyond 2100").

Given the short duration of the stay, and the lack of any discernable environmental benefits attributable to EPA's GHG rules, there is no environmental harm in staying EPA's GHG rules. On the contrary, such a stay will serve the public interest by providing greater regulatory certainty, avoiding government waste, and avoiding the economic, employment and other costs from imposing an intrusive and baseless regulatory scheme – and one which is unlikely to survive judicial scrutiny – on the entire U.S. economy.

3. These Petitioners and Their Members Will Suffer Irreparable Harm if EPA's GHG Rules are Allowed to Take Effect Prior to Judicial Review.

EPA's GHG Rules will cause (and are causing) harm to these Petitioners and their members that is "both certain and great," and furthermore is irreparable, because these Petitioners and their members have no mechanism for recovering compensation for the economic losses they are and will be incurring. *See, Wisconsin Gas v. FERC*, 758 F.2d at 674. These direct and irreparable harms include:

a. The legal necessity to obtain permits in the absence of State permitting programs to issue them (effectively amounting to an indefinite construction ban);

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b. Promoting NGO opposition to projects based on misuse of the Endangerment Finding; and

c. Lost profits and business opportunities based on market uncertainties, and the uncertainty tax imposed by EPA's GHG rules.

For all of the foregoing reasons, these Petitioners request that EPA promptly stay the four GHG rules pending judicial resolution of all the pending cases.

Sincerely yours,

On behalf of the Coalition for Responsible Regulation, Industrial Minerals Association-North America, National Cattlemen's Beef Association, Great Northern Project Development, L.P., Rosebud Mining Company, and Alpha Natural Resources, Inc.:

/s/ Paul D. Phillips

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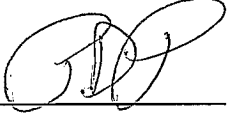
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September 7, 2010

Page 7



On behalf of the Competitive Enterprise Institute, FreedomWorks & the Science and Environmental Policy Project:

/s/ Sam Kazman 

Sam Kazman

Hans Bader

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On behalf of the Southeastern Legal Foundation, Inc., et al.:

/s/ Shannon L. Goessling 

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On behalf of the Landmark Legal Foundation and Mark R. Levin:

/s/ Richard P. Hutchison 

Richard P. Hutchison

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EXHIBIT 2

**Letter from OCA to EPA
dated Sept. 15, 2010
concerning voluntary stay**

McGUIREWOODS

September 15, 2010

**VIA OVERNIGHT MAIL &
FACSIMILE (202-501-1450)**

Honorable Lisa Jackson
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: Petition for Stays of EPA's Endangerment Finding, 74 Fed. Reg. 66,496 (Dec. 15, 2009); Timing Rule, 75 Fed. Reg. 17,004 (Apr. 2, 2010); Tailpipe Rule, 75 Fed. Reg. 25,324 (May 7, 2010); and Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010)

Dear Administrator Jackson:

I write on behalf of the Ohio Coal Association (OCA) and our members, and in support of the many organizations, including the National Association of Manufacturers and the Coalition for Responsible Regulation, Inc. (Coalition), which have previously filed similar petitions, to request that the United States Environmental Protection Agency (EPA) to promptly issue a stay pending judicial review of the following four rules relating to greenhouse gases ("GHGs"):

1. EPA's GHG Endangerment finding under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) (Endangerment Finding), the subject of the Coalition's Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 09-1322 (D.C. Cir.);

2. EPA's rule concluding that EPA's decision to regulate greenhouse gas emissions from vehicles requires that stationary sources obtain permits based on their greenhouse gas emissions starting on January 2, 2011, 75 Fed. Reg. 17,004 (Apr. 2, 2010) ("Timing Rule"), the subject of the Coalition's Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 10-1073 (D.C. Cir.);

3. EPA's decision to enact limits on automobile tailpipe emissions of GHGs beginning with model year 2012 cars, 75 Fed. Reg. 25,324 (May 7, 2010) ("Tailpipe

Rule”), the subject of the Coalition’s Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 10-1092 (D.C. Cir.); and

4. EPA’s rule seeking to amend the permit requirements set forth in the language of the Clean Air Act in an effort to avoid the “absurd results” that flow from the statutory construction expressed by the Agency in these other three rules, 75 Fed. Reg. 31,514 (June 3, 2010) (“Tailoring Rule”), the subject of the Coalition’s Petition for Review in *Coalition for Responsible Regulation, Inc., et al. v. U.S. EPA*, No. 10-1132 (D.C. Cir.).

These Petitioners do not challenge the National Highway Traffic Safety Administration (“NHTSA”) CAFE mileage standards promulgated simultaneously with (and duplicative of) the Tailpipe Rule, and specifically petitions that the requested stay be limited to ensure that the NHTSA CAFE standards are allowed to take effect as scheduled.

OCA is an unincorporated trade association dedicated to representing Ohio’s coal industry. As a united front, the Association is committed to advancing the development and utilization of Ohio coal as an abundant, economic, and environmentally sound energy source.

EPA has authority to issue the requested stay pursuant to 5 U.S.C. § 705, providing that “[w]hen an Agency finds that justice so requires, it may postpone the effective date of action taken by it pending judicial review.” OCA agrees with and sets forth below as its own, the reasons that argue for EPA to adopt the requested stays that were previously asserted by the Coalition:

This is a case where the interests of justice require postponing the effective dates of all four of these rules pending judicial review, for the following reasons:

1. EPA’s GHGs Rules Are Legally Deficient and Unlikely to Survive Judicial Review.

EPA’s Endangerment Finding, from which the Tailpipe, Timing and Tailoring Rules derive, was based upon a fundamentally flawed rulemaking process which in turn resulted in fatal procedural and substantive defects in that Finding. These substantive and procedural defects are laid forth in detail in the Coalition’s Comments and Supplemental Comments on the Endangerment Finding, which are incorporated herein by reference and can be found in EPA’s Endangerment Docket (Docket ID No. EPA-HQ-OAR-2009-0171). More specifically:

a. EPA did not independently assess the science underlying its Endangerment Finding, instead simply repeating the assessments of other entities, particularly the IPCC, thereby unlawfully sub-delegating EPA’s statutory duties without

Congressional authorization. This unlawful delegation of decision-making authority to third parties who were neither subject to the substantive requirements of the Clean Air Act nor to the disclosure/open records obligations of American law not only tainted the entire public review and comment process, but also was in direct violation of EPA's obligations under Section 202 of the Clean Air Act and applicable case law. *See, e.g., U.S. Telecom Assn. v. FCC*, 359 F.3d 554, 565 (D.C. Cir. 2004). ("Federal agency officials . . . may not sub-delegate to outside entities – private or sovereign – absent affirmative evidence of authority to do so.")

b. EPA misconstrued and thus failed to make the judgments required under Section 202(a) of the Clean Air Act, rendering its Endangerment Finding unconstrained by any "reasonable limits," contrary to the Act and applicable case law. *See, Ethyl Corp. v. EPA*, 541 F.2d 1, 32 (D.C. Cir. 1976). In finding that anthropogenic GHGs "endanger" public health and welfare while failing completely to define what level of GHGs in the atmosphere "endanger" or what specific harms avoided or benefits achieved will be accomplished by EPA's regulation of GHGs, EPA has in effect promulgated a standardless standard, and stretched the precautionary principal beyond its breaking point. This is the same kind of erroneous interpretation of the law that caused the Supreme Court to invalidate workplace exposure limits in *Industrial Union Dept. v. American Petroleum Inst.*, 448 U.S. 607, 646 (1980).

c. EPA's scientific conclusions were incomplete, conclusory, logically flawed, and lacking in basic rationality. The unscientific and result-driven analysis and conclusions which EPA followed in making the Endangerment Finding fall short of the legal requirement that, for an Agency's actions to be upheld, its "reasons and policy choices [must] conform to 'certain minimal standards of rationality.'" *National Wildlife Federation v. EPA*, 286 F.3d 554, 559 (D.C. Cir. 2002).

d. EPA failed to conduct any of the economic evaluation, assessment of cost and benefits, and other analysis required under the Clean Air Act. *See, e.g.,* Section 202(a)(1) and (2).

EPA's Tailpipe, Timing and Tailoring Rules triggered by EPA's Endangerment Finding are likewise legally defective in at least four ways:

- a. All are predicated on the deeply flawed Endangerment Finding.
- b. The Tailpipe Rule creates a single standard for multiple pollutants, including pollutants not found in vehicle emissions.
- c. All fail to quantify any health and welfare benefit to the rules.
- d. The Timing and Tailoring Rules fail to consider the cost or benefit caused by stationary source regulation of GHGs.

The pervasive lack of rational basis for the regulatory scheme created by this web of defective rules is highlighted by EPA's open admission that the so-called Tailoring Rule is necessary because otherwise the plain language of the Clean Air Act mandates "absurd" results from application of EPA's GHG rules. 75 Fed. Reg. at 31,514.

2. No Environmental Harm or Detriment Would Result From Staying EPA's GHG Rules and a Stay Would Benefit the Public Interest.

Nothing in the hundreds of pages of preamble and regulations that EPA has promulgated under its four GHG rules ties any specifically expected GHG reductions to specifically demonstrated environmental benefits. Nowhere does EPA even attempt to determine by how much worldwide concentrations of GHGs will be reduced by its GHG rules; neither does the Agency try to describe the extent to which the adverse consequences speculated about in the Endangerment Finding would be avoided or mitigated by its rules. In fact, EPA expressly disavows any need or obligation to do so. 74 Fed. Reg. at 66,507. To the extent the Tailpipe Rule attempts to do so, even this is illusory and provides no basis for denying a stay, because:

a. EPA's GHG tailpipe emission limits are merely duplicative of the NHTSA CAFE mileage standards, which are not being challenged by these (or any other) Petitioners in these proceedings; thus, whatever environmental benefits can be attributed (wrongly or rightly) to the Tailpipe Rule already will occur under that separate legal requirement; and

b. EPA itself can attribute "benefits" to the tailpipe limits no greater than moderating temperatures by **one one-hundredth** of a degree Centigrade and **one-tenth** of a centimeter in sea level rise, **over a 100-year period**. 75 Fed. Reg. at 25,495. Such infinitesimal "benefits" over such a long period are far below natural fluctuations in these complex global-scale natural systems, and well within the error band of any currently-available predictive modeling or measurement systems.

It also bears emphasizing that the stay being requested here is for the roughly 6-12 months to allow the D.C. Circuit to consider and rule on the challenged regulations in an orderly fashion. Such a stay can hardly be said to be material or detrimental, when the alleged harms occur (at worst) over vast time spans. *See*, 74 Fed. Reg. at 66,514 ("[t]he underlying science upon which the Administrator is basing her findings generally considers the next several decades – the time period out to 2100, and for certain impacts, the time period beyond 2100").

Given the short duration of the stay, and the lack of any discernable environmental benefits attributable to EPA's GHG rules, there is no environmental harm in staying EPA's GHG rules. On the contrary, such a stay will serve the public interest by providing greater regulatory certainty, avoiding government waste, and

avoiding the economic, employment and other costs from imposing an intrusive and baseless regulatory scheme – and one which is unlikely to survive judicial scrutiny – on the entire U.S. economy.

3. OCA and Its Members Will Suffer Irreparable Harm if EPA's GHG Rules are Allowed to Take Effect Prior to Judicial Review.

EPA's GHG Rules will cause (and are causing) harm to the OCA's members that is "both certain and great," and furthermore is irreparable, because the Coalition's members have no mechanism for recovering compensation for the economic losses they are and will be incurring. *See, Wisconsin Gas v. FERC*, 758 F.2d at 674. These direct and irreparable harms include:

- a. The legal necessity to obtain permits in the absence of State permitting programs to issue them (effectively amounting to an indefinite construction ban);
- b. Promoting NGO opposition to projects based on misuse of the Endangerment Finding; and
- c. Lost profits and business opportunities based on market uncertainties, and the uncertainty tax imposed by EPA's GHG rules.

For all of the foregoing reasons, the OCA requests that EPA promptly stay the four GHG rules pending judicial resolution of all the pending cases.

Sincerely yours,



Neal J. Cabral

EXHIBIT 3

**EPA website, “Control of
Greenhouse Gas Emissions
from Heavy Duty Vehicles”**



Rulemaking Gateway

Control of Greenhouse Gas Emissions from Heavy-Duty Vehicles

a.k.a. Heavy-duty Vehicles GHG Emissions Standards

RIN: 2060-AP61 ([What's this?](#))

Docket No.: Not yet available ([What's this?](#))

Current Phase: Pre-Proposal ([What's this?](#))

Abstract:

This action would set national emission standards under the Clean Air Act to control greenhouse gas emissions from heavy duty trucks and buses. This rulemaking would significantly reduce GHG emissions from future heavy duty vehicles by setting GHG standards that would lead to the introduction of GHG-reducing vehicle and engine technologies. This action follows the U.S. ([More](#))

Supreme Court decision in Massachusetts vs. EPA and would follow EPA's formal determination on endangerment for GHG emissions. This rulemaking also follows the Advance Notice of Proposed Rulemaking "Regulating Greenhouse Gas Emissions Under the Clean Air Act," (73 FR 44354, July 20, 2008).

Timeline

Milestone	Date
Initiated	04/30/2009
NPRM: Sent to OMB for Regulatory Review	08/11/2010
NPRM: Received by OMB	08/13/2010
NPRM: Published in FR	10/2010 (projected)

Potential Effects

Children's Health

This rule is likely to address an adverse impact on childhood lifestages, including prenatal (via exposure to women of childbearing age). The potential adverse impacts are expected to be due to exposure and toxicity. ("Exposure" means children and/or women of childbearing age are more likely to be highly exposed than other lifestages. "Toxicity" means the developing fetus, infants, and/or children are more likely to have an adverse response than adult lifestages.)

Environmental Justice

This rulemaking involves a topic that is likely to be of particular interest to or have particular impact upon minority, low-income, tribal, and/or other vulnerable populations because:

- This topic is likely to impact the health of vulnerable populations.
- This topic is likely to impact the environmental conditions of vulnerable populations.
- This topic is likely to present an opportunity to address an existing disproportionate impact on vulnerable populations.

Unfunded Mandates

This action may place unfunded mandates on the private sector and is subject to Section 202 of the Unfunded Mandates Reform Act.

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Regulatory Review

Some of EPA's rulemakings undergo regulatory review ([What's this?](#)), as prescribed by [Executive Order 12866](#) and coordinated by the Office of Management and Budget (OMB). The following list describes which of this rulemaking's stages have completed review and published in the *Federal Register*, if any, and provides links to the review documents where available. Consult the "Timeline" section of this Web page for the dates of each review.

- **NPRM** - No Information Available.

Citations & Authorities

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Case: 09-1322 Document: 1266030 Filed: 09/15/2010 Page: 3

Code of Federal Regulations (CFR) Citation

Not Yet Determined

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Legal Authority

Clean Air Act Section 202

Last updated on Wednesday, September 1, 2010.

EXHIBIT 4

Petition of Center for Biological Diversity to EPA (Dec. 2, 2009)

BEFORE THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY

PETITION TO ESTABLISH NATIONAL POLLUTION LIMITS FOR
GREENHOUSE GASES PURSUANT TO THE CLEAN AIR ACT



Smokestacks by Phillip J. Redman, USGS; polar bear © Thomas D. Mangelsen/Imagesofnaturestock.com; Times Square © Shadia Fayne Wood

Center for Biological Diversity
350.org
Petitioners

December 2, 2009

EXECUTIVE SUMMARY

As atmospheric carbon dioxide levels approach 390 parts per million (ppm), the consequent effects of global warming are becoming ever more apparent. Severe droughts and heat waves, extreme weather events, and other climate disruptions are leaving more than 300,000 people dead per year. Arctic sea ice loss, bleaching of coral reefs, and species extinctions are mounting. At this moment, there can be no reasonable dispute that greenhouse gases endanger public health and welfare and that concentrations of carbon dioxide and other greenhouse gases in the atmosphere already exceed safe levels. Indeed, the Environmental Protection Agency (EPA) concluded in April 2009 that “[t]he evidence points ineluctably to the conclusion that climate change is upon us as a result of greenhouse gas emissions, that climate changes are already occurring that harm our health and welfare, and that the effects will only worsen over time in the absence of regulatory action.”¹

Through this Petition, the Center for Biological Diversity and 350.org request that the EPA do what the science dictates and the law requires: take necessary regulatory action to control greenhouse gas emissions. As a matter of both law and science, EPA must recognize that carbon dioxide and other greenhouse gases are reasonably anticipated to endanger public health and welfare. Accordingly, Petitioners request that EPA declare carbon dioxide a “criteria” air pollutant pursuant to the Clean Air Act and set a national pollution limit (National Ambient Air Quality Standard, or NAAQS) for carbon dioxide at no greater than 350 ppm—a level that accurately reflects the most recent scientific knowledge. Petitioners further request that EPA similarly designate other greenhouse gases as criteria pollutants and establish pollution caps for those gases at science-based levels.

Under the Clean Air Act, the Obama administration and the EPA have not only the authority, but also the clear legal duty, to take such action as is necessary to set the United States on a course towards reducing atmospheric carbon dioxide concentrations below dangerous levels. Designating carbon dioxide and other greenhouse gases as criteria pollutants and setting appropriate science-based national pollution limits for each such pollutant are essential components of this process.

The Clean Air Act provides the tools necessary for the U.S. to commit to the deep and rapid greenhouse emissions reductions—on the order of 45% or more below 1990 levels by 2020—needed to avert the worst impacts of climate change. National pollution caps for greenhouse gases under the Clean Air Act would provide a scientific benchmark to guide all national climate policy. These national pollution caps also would serve as the basis for development of emissions reduction trajectories to achieve those limits. Those reductions would then be implemented by the states through updates of their existing “state implementation plans.” Because the existing Clean Air Act not only facilitates but requires such efforts, the Obama administration need not gamble on whether Congress will pass new climate legislation, but rather should move quickly to commit to such reductions in the international climate negotiations of the United Nations Framework Convention on Climate Change.

¹ The Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18886, 19904 (April 24, 2009).

Establishing science-based national pollution caps for greenhouse gases would rely on the heart of the Clean Air Act—a set of comprehensive and complementary provisions already proven effective in controlling air pollution from most major sources in the U.S. This petition seeks action under Clean Air Act sections 108-110 (42 U.S.C. §§ 7408-7410), which govern designation of criteria air pollutants, establishment of national air pollution limits (NAAQS), and coordination of state implementation planning. Section 108 (42 U.S.C. § 7408) requires EPA to make a list of air pollutants emitted by many or diverse sources that cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare. Within 12 months of adding a pollutant to the list, the EPA must issue air quality “criteria” that specify the pollutant’s known effects on the public health and welfare, and “accurately reflect the latest scientific knowledge.”² Upon issuance of these criteria, EPA also must set a national pollution limit sufficient to protect the public health and welfare, pursuant to section 109 (42 U.S.C. § 7409). Under section 110 (42 U.S.C. § 7410), each state must develop and implement a state implementation plan to meet the national pollution limit through enforceable emissions controls for pollution sources within that state. Other complementary provisions of the statute aid the states in meeting the national pollution limit through additional requirements for stationary and mobile pollution sources.

The Clean Air Act’s state implementation program is a vital component of a comprehensive and cost-effective strategy to significantly reduce greenhouse gases. State implementation plans describe how each state will implement, maintain, and enforce existing national pollutant limits in a manner that allows each state to take its own emissions profile and industry needs into account. States have long-standing experience in reducing existing criteria pollutants through the state implementation plan process.

Indeed, through independent processes, many states already have taken several of the steps necessary for greenhouse gas-related state implementation planning. As of August 2009, at least forty-seven states have completed or are completing a greenhouse gas inventory, thirty-eight are drafting or have drafted climate action plans, and twenty-three states have adopted emissions reduction targets.³ Many of these programs achieve progress in areas not typically covered under federal programs, including land use regulation, local building codes, density patterns of development and transportation infrastructure, and the regulation of agriculture, forestry and non-hazardous waste handling, activities which together account for a significant share of total U.S. greenhouse gas emissions. The state implementation planning process will leverage such state emission control efforts by adding a common, science-based greenhouse gas pollution limit, providing technical information and assistance, ensuring consistency among states, and addressing interstate leakage concerns by requiring the participation of those states that have yet to take action—all while retaining maximum local implementation flexibility. State implementation plans will serve to integrate rapidly expanding state and local climate change programs into a comprehensive and efficient national effort.

² Clean Air Act § 108, 42 U.S.C. § 7408(a)(2). The criteria pollutants listed to date are particle pollution (PM), ground-level ozone (O₃), carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), and lead.

³ U.S. Env’tl. Prot. Agency, State and Local Governments, State Planning and Measurement, http://www.epa.gov/climatechange/wycd/stateandlocalgov/state_planning.html#three (last visited Dec. 1, 2009); Pew Ctr. on Global Climate Change, U.S. Climate Policy Maps, http://www.pewclimate.org/what_s_being_done/in_the_states/state_action_maps.cfm (last visited Dec. 1, 2009).

Moreover, a national pollution limit for greenhouse gases will effectively guide both the Clean Air Act's other pollution reduction programs and other complementary efforts that may be initiated through new legislation. Informed by a science-based national pollution limit, the Clean Air Act's other successful pollution reduction programs, such as new source review, new source performance standards, and greenhouse gas reduction rules for automobiles and other mobile pollution sources, will provide the essential blueprint for the United States' greenhouse gas reduction efforts.

Climate change obviously poses global problems. Yet these problems cannot be solved unless each nation limits its own emissions sufficiently to achieve its share of the reductions necessary to stabilize atmospheric greenhouse gas concentrations below dangerous levels. With the Clean Air Act, the Obama administration and the EPA already have in their grasp a set of uniquely effective tools to reach this goal: existing and robust legal authority to set national pollution limits for greenhouse gases and to facilitate preparation of state implementation plans that will move toward attainment of those limits.

For these reasons, Petitioners Center for Biological Diversity and 350.org, pursuant to the Clean Air Act, 42 U.S.C. §§ 7401 et seq., its implementing regulations, and the Administrative Procedures Act, 5 U.S.C. § 553(e), hereby request that the Administrator of the Environmental Protection Agency (hereinafter "Administrator," or "EPA") regulate the following long-lived greenhouse gases pursuant to Clean Air Act Sections 108-110 (42 U.S.C. §§ 7408-7410):

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Hydrofluorocarbons (HFCs)⁴;
- Perfluorocarbons (PFCs);
- Sulfur hexafluoride (SF₆); and
- Nitrogen trifluoride (NF₃).

Specifically, Petitioners request that the EPA complete the following actions:

(1) Pursuant to Clean Air Act section 108(a)(1) (42 U.S.C. § 7408(a)(1)): promptly revise the list of pollutants which may reasonably be anticipated to endanger public health or welfare to include the greenhouse gases;

(2) Pursuant to Clean Air Act section 108(a)(2) (42 U.S.C. § 7408(a)(2)): expeditiously (but in no event later than 12 months from the revision of section 108(a)(1) list) issue air quality criteria for the greenhouse gases;

(3) Pursuant to Clean Air Act section 109(a) (42 U.S.C. § 7409(a)): publish, simultaneously with the air quality criteria described above, proposed national primary and

⁴ Petitioners seek regulation of all HFCs and PFCs for which either significant concentrations or large trends in concentrations have been observed or a clear potential for future emissions has been identified. Appendix A provides a complete list of the petitioned HFCs and PFCs.

secondary pollution caps (national ambient air quality standards, or NAAQS) for the greenhouse gases in order to protect the public health and welfare, and finalize the pollution caps no later than 90 days from the initial publication;

(4) Pursuant to Clean Air Act sections 108 & 108(f) (42 U.S.C. §§ 7408 & 7408(f)): expeditiously make available information on processes, procedures, and methods to reduce or control pollutants of the greenhouse gases in transportation, from other mobile sources, and to protect the health of sensitive individuals and groups pursuant to section 108(f), and carry out all of the other related actions specified in section 108;

(5) Pursuant to Clean Air Act section 108(b)(1) (42 U.S.C. § 7408(b)(1)): simultaneously with the issuance of the air quality criteria above, issue information on air pollution control techniques for the greenhouse gases;

(6) Pursuant to Clean Air Act section 110 (42 U.S.C. § 7410): expeditiously facilitate and aid the states in the state implementation plan process.

In short, the Clean Air Act already contains the comprehensive, science-based, flexible, and immediately available tools necessary to address the climate crisis. For four decades, the Clean Air Act has vastly improved air quality and reduced pollution levels, saved lives and provided health and economic benefits worth many times the cost of the pollution reductions. The Clean Air Act is one of the most efficient and successful environmental laws ever devised, and its science and technology-based mechanisms are time-tested and well understood by both industry and state and federal agencies throughout the nation. This comprehensive, yet flexible and cooperative, pollution reduction system is well-suited to combat the greatest environmental crisis the modern world has faced—global warming caused by greenhouse gas emissions. The Obama administration can and must begin using its authority under the Clean Air Act towards this end.

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NOTICE OF PETITION

I. Statutory Authority and Actions Requested

Pursuant to the Clean Air Act, 42 U.S.C. §§ 7401 et seq., its implementing regulations, and the Administrative Procedures Act, 5 U.S.C. § 553(e), Petitioners Center for Biological Diversity and 350.org hereby request that the Administrator of the Environmental Protection Agency take the actions described herein with respect to the following long-lived greenhouse gases:

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Hydrofluorocarbons (HFCs)⁵;
- Perfluorocarbons (PFCs);
- Sulfur hexafluoride (SF₆); and
- Nitrogen trifluoride (NF₃).

The specific actions requested with regard to the five greenhouse gases and two categories of greenhouse gases which are the subject of this petition are as follows:

(1) Pursuant to Clean Air Act section 108(a)(1) (42 U.S.C. § 7408(a)(1)): promptly revise the list of pollutants which may reasonably be anticipated to endanger public health or welfare to include the greenhouse gases;

(2) Pursuant to Clean Air Act section 108(a)(2) (42 U.S.C. § 7408(a)(2)): expeditiously (but in no event later than 12 months from the revision of section 108(a)(1) list) issue air quality criteria for the greenhouse gases;

(3) Pursuant to Clean Air Act section 109(a) (42 U.S.C. § 7409(a)): publish, simultaneously with the air quality criteria described above, proposed national pollution caps (national primary and secondary ambient air quality standards) for the greenhouse gases in order to protect the public health and welfare, and issue final pollution caps no later than 90 days from the initial publication;

(4) Pursuant to Clean Air Act sections 108 & 108(f) (42 U.S.C. §§ 7408 & 7408(f)): expeditiously make available information on processes, procedures, and methods to reduce or control pollutants of the greenhouse gases in transportation, from other mobile sources, and to protect the health of sensitive individuals and groups pursuant to section 108(f), and carry out all of the other related actions specified in section 108;

⁵ Petitioners seek regulation of all HFCs and PFCs for which either significant concentrations or large trends in concentrations have been observed or a clear potential for future emissions has been identified. Appendix A provides a complete list of the petitioned HFCs and PFCs.

(5) Pursuant to Clean Air Act section 108(b)(1) (42 U.S.C. § 7408(b)(1)): simultaneously with the issuance of the air quality criteria described above, issue information on air pollution control techniques for the greenhouse gases;

(6) Pursuant to Clean Air Act section 110 (42 U.S.C. § 7410): expeditiously facilitate and aid the states in the State Implementation Plan process.

Pursuant to the Administrative Procedure Act, 5 U.S.C. § 553(e), and the Clean Air Act, 42 U.S.C. §§ 7401 et seq., petitioners file this petition and respectfully request that EPA undertake these mandatory duties. This petition places definite response requirements on the EPA. The scientific basis for the requested actions is set forth fully in the petition and the literature cited herein.

II. Petitioners

The Center for Biological Diversity works through science, law, and creative media to secure a future for all species, great or small, hovering on the brink of extinction. The Center's Climate Law Institute develops and implements legal campaigns to limit global warming pollution and prevent it from driving species extinct. The Center has over 225,000 members and online activists with a vital interest in the immediate reduction of greenhouse gas pollution under the Clean Air Act as one of the primary solutions to the climate crisis. www.biologicaldiversity.org

350.org is an international campaign dedicated to building a movement to unite the world around solutions to the climate crisis--the solutions that science and justice demand. Their focus is on the number 350--as in parts per million, the level scientists have identified as the safe upper limit for CO₂ in our atmosphere. On October 24, 2009, 350.org organized the most widespread day of environmental action in the planet's history, when people in 181 countries at over 5,200 events gathered to call for action on the climate crisis. www.350.org

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INTRODUCTION AND OVERVIEW OF THE CLEAN AIR ACT

I. The Clean Air Act: Background and Structure

The Clean Air Act is one of the nation's and the world's most important and successful environmental laws. Enacted in 1970 in response to growing environmental awareness, the Clean Air Act uses a variety of complementary pollution control mechanisms, as well as combined federal-state action termed "cooperative federalism,"⁶ to reduce pollution from all sectors of the U.S. economy. The Act's far-reaching and effective pollution reduction mechanisms have substantially improved air quality and public health over the past four decades even though the American economy has expanded dramatically at the same time.

The Clean Air Act today consists of six titles which provide comprehensive, and in many cases overlapping and complementary, provisions to control pollution from most major sources in the U.S. Title I of the Clean Air Act addresses air pollution from stationary sources.⁷ The program established by sections 108-110 (42 U.S.C. §§ 7408-7410) dealing with criteria air pollutants, national air pollution limits (national ambient air quality standards, or NAAQS), and state implementation planning is in many ways the heart of the modern law. Section 108 (42 U.S.C. § 7408) requires EPA to list air pollutants emitted by many or diverse sources that cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare. Within 12 months of adding a pollutant to the list, the EPA must issue air quality criteria which specify the known effects on the public health and welfare from each such pollutant. The criteria pollutants listed to date are particle pollution (PM), ground-level ozone (O₃), carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), and lead. For each criteria pollutant, EPA must set a national pollution limit as necessary to protect the public health and welfare, pursuant to Section 109 (42 U.S.C. § 7409). Under section 110 (42 U.S.C. § 7410), each state must develop and implement a state implementation plan to meet the national pollution limit through enforceable emissions controls for pollution sources within that state. Other complementary provisions of the statute aid the states in meeting the national pollution limit through additional requirements for stationary and mobile pollution sources.

Under section 111 (42 U.S.C. § 7411), EPA must set new source performance standards for major categories of new and modified stationary pollution sources. EPA sets new source performance standards for both criteria and non-criteria pollutants. While the new source review program (discussed below) relies upon site-specific and individual permit review, the new source performance standards set a threshold level for emissions which a prevention of significant deterioration permit must meet or exceed. Once a new source performance standard has been established for a new and/or modified source, the states must set standards for existing sources in each category, except for criteria pollutants and hazardous air pollutants regulated pursuant to section 112 (42 U.S.C. § 7412).

⁶ See, e.g., Holly Doremus & W. Michael Hanemann, *Of Babies and Bathwater, Why the Clean Air Act's Cooperative Federalism Framework Is Useful for Addressing Global Warming*, 50 ARIZ. L. REV. 799, 827-28 (2008).

⁷ See generally DAVID R. WOOLEY & ELIZABETH M. MORSS, *THE CLEAN AIR ACT HANDBOOK* (Thompson West ed., 8th ed. 2008) (for further background on the Clean Air Act).

Section 112 (42 U.S.C. § 7412) requires EPA to list and issue national emissions standards for hazardous air pollutants (HAPs) from stationary sources. The Act contains low thresholds for these air toxics, defined as any pollutant that presents or may present a threat of adverse human or environmental effects, including carcinogenic, mutagenic, neurotoxic and acutely or chronically toxic substances.

The new source review program provides controls for new major sources or modifications of major sources of pollution in order to meet the national pollution caps, and is made up of two sub-programs, prevention of significant deterioration and non-attainment new source review. The prevention of significant deterioration program is designed to prevent new and modified sources from degrading air quality in areas where the air is clean enough to fall within the national pollution limits, known as “attainment areas.” This program, found in Clean Air Act sections 7470-7492, requires all new and modified stationary sources to undergo a preconstruction permitting process and to install best available control technology for each pollutant otherwise subject to regulation under the Act. The second new source review sub-program, known as “non attainment new source review,” provides similar but more ambitious permitting requirements for sources in areas where the national pollution limits are not being met, termed “non-attainment areas.”

Title II of the Clean Air Act requires EPA to regulate mobile sources of air pollution, including passenger vehicles pursuant to section 202 (42 U.S.C. § 7521), ships and non-road vehicles pursuant to section 213 (42 U.S.C. § 7547), and aircraft pursuant to section 231 (42 U.S.C. § 7571). Title II also provides for the regulation of the fuels used to power these mobile sources, and section 211(o) (42 U.S.C. § 7545(o)) establishes the renewable fuels standard program, which requires an increase in the use of renewable fuels with significantly lower lifecycle greenhouse gas emissions than the fossil-fuel based fuels they replace.

Titles III provides general provisions related to reporting on the effectiveness of the act, air quality monitoring, citizen suits, and other matters.

Title IV, established by the 1990 Amendments, added a trading program to control SO₂, a primary acid rain precursor. Under the Title IV program, regulated utilities must hold pollution allowances equal to their total allowed emissions of SO₂, and may meet their reduction obligations either by reducing pollution at their own facility or by buying allowances from other facilities that reduced their pollution below the allowed levels.

Title V, also added by the 1990 Amendments, enhanced the ability of state and federal regulators and citizen groups to monitor compliance with the Act by establishing a new operating permit system. The Title V permitting system requires all new and existing major sources to have an operating permit listing all of the rules and regulations applicable to the facility, and requires permittees to monitor compliance, self-report any violations at least semi-annually, and certify compliance annually.

Title VI requires EPA to take a number of actions to protect the stratosphere, including especially the ozone layer which protects the Earth from harmful UVB radiation. Section 615

(42 U.S.C. § 7671n) provides broad authority to regulate ozone-depleting substances that endanger public health and welfare.

II. Benefits from Past Regulation Under the Clean Air Act Vastly Outweigh the Costs

The Clean Air Act has provided indispensable benefits to this country for more than four decades. Study after study has shown that the substantial improvements in air quality achieved through the Act have not only resulted in enormous public health, ecological, and other benefits, but have also been accomplished so efficiently that the economic value of the benefits exceed by many times the costs of the pollution reduction measures.

Under the 1990 Clean Air Act amendments, Congress required EPA to issue a comprehensive assessment of the Clean Air Act's impact on the "public health, economy, and environment of the United States."⁸ EPA issued the first such report in October 1997, following an extensive and rigorous research and modeling effort.⁹ It found that emissions of SO₂ were 60 percent lower from industrial processes and 40 percent lower from electricity generation, emissions of VOCs 66 percent lower, emissions of NO_x 47 percent lower, emissions of CO 56 percent lower, emissions of PM from electric utilities 93 percent lower, and emissions of PM from industrial processes 76 percent lower in 1990 than they would have been without the Clean Air Act.¹⁰ Emissions of airborne lead had been virtually eliminated.¹¹ EPA modeled the impact of the resulting improvements in air quality on human health, including impacts such as respiratory symptoms, hospital admissions, asthma attacks, and chronic sinusitis from exposure to ozone; mortality, bronchitis, hospital admissions, and lost work days from exposure to PM; hospital admissions for congestive heart failure from exposure to CO; respiratory illness from exposure to NO_x; changes in pulmonary function and respiratory symptoms from exposure to SO₂; and mortality, hypertension, coronary heart disease, strokes, and IQ loss from exposure to lead.¹² EPA also modeled selected welfare effects including changes in crop yields from exposure to ozone, household soiling from PM, and visibility impairment from PM, NO_x and SO₂.¹³

⁸ Clean Air Act § 312, 42 U.S.C. § 7612 (2008) (the review requirements are often referred to as the "section 812" requirements as they were included in section 812 of the 1990 Clean Air Act amendments).

⁹ U.S. ENVTL. PROT. AGENCY, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT: 1970 TO 1990 (1997), *available at* <http://www.epa.gov/air/sect812/copy.html>. EPA conducted the study in consultation with an outside panel of highly qualified experts known as the Advisory Council on Clean Air Act Compliance Analysis organized in 1991 under the auspices of EPA's Science Advisory Board. The study constructed and compared a "no-control scenario," in which federal, state, and local air pollution controls are frozen at the levels of stringency and effectiveness that existed in 1970 to a "control scenario" which assumes that all federal, state, and local rules promulgated pursuant to the Clean Air Act during 1970 to 1990 were implemented. The analysis estimates the differences between the economic and environmental outcomes associated with these two scenarios and brings a level of validity, breadth, and integration that exceeded any effort to that time.

¹⁰ *Id.* at 15-17.

¹¹ *Id.*

¹² *Id.* at 31.

¹³ *Id.* at 32.

EPA concluded that the economic benefits of Clean Air Act implementation, valued in 1990 dollars, range from \$5.6 to \$49.4 trillion with a central estimate of \$22.2 trillion.¹⁴

EPA also analyzed the cost of the pollution reductions by examining changes in patterns of industrial production, capital investment, productivity, consumption, employment, and overall economic growth. Using a 5% discount rate, EPA estimated the total costs of the Clean Air Act regulations to be \$.523 trillion.¹⁵

The economic value of the Act's benefits, therefore, was about 42 times greater than its costs.

More recent analyses have continued to affirm both the effectiveness and efficiency of the Clean Air Act. In 1999 EPA released the first prospective cost-benefit analysis of the 1990 Clean Air Act amendments, and concluded once again that the value of the benefits from the amendments would far exceed the costs. In total EPA estimated that in 2010 the benefits due to the 1990 Amendments would prevent 23,000 Americans from dying prematurely, avert over 1,700,000 incidences of asthma attacks and aggravation of chronic asthma, prevent 67,000 incidences of chronic and acute bronchitis, 91,000 occurrences of shortness of breath, 4,100,000 lost work days, and 31,000,000 days in which Americans would have had to restrict activity due to air pollution related illness, in addition to preventing 22,000 respiratory-related hospital admissions, 42,000 cardiovascular hospital admissions, and 4,800 emergency room visits for asthma.¹⁶ The total value of the health and ecological benefits totaled \$110 billion, as opposed to only about \$27 billion in costs.¹⁷

Thus, early critics who claimed that the Act would be unworkable, too expensive and an unsustainable burden on the American economy have been proven incorrect. "[W]hile industry claims often frame the debate, they are usually exaggerated, not accurate descriptions of the truth but tactics to stop unwanted measures, regardless of the need or merit. Many business interests predicted catastrophe were the [Clean Air Act] enacted. DuPont Chemical warned of 'severe

¹⁴ *Id.* at ES-8. EPA stressed that the monetary quantification method tended to underestimate health and environmental benefits for a number of reasons. First, limitations in air quality modeling prevented comprehensive estimates in changes in air quality. *Id.* at 25-27. Second, a wide variety of beneficial impacts to both health and the environment could not be quantified economically. *Id.* at 30. Third, the valuation of many health effects included economic costs such as physician visits, medications costs, and lost work time, but excluded the value of what one would be willing to pay to avoid the associated pain and suffering and thus, the valuations almost certainly represent lower-bound estimates for these impacts. Moreover, many recent studies show that exposure to air pollution, particularly ozone and particulate matter, is actually far more dangerous and deadly than previously thought, again tending to show that the major EPA reports of the past decade almost certainly have *underestimated* the Act's benefits.

¹⁵ *Id.* at ES-8.

¹⁶ U.S. ENVTL. PROT. AGENCY, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT: 1990 TO 2010 60-61 (1999), available at <http://www.epa.gov/air/sect812/1990-2010/fullrept.pdf>; see also Press Release, U.S. Env'tl. Prot. Agency, The Benefits and Costs of the Clean Air Act, First Protective Study (Nov. 16, 1999), <http://www.epa.gov/air/sect812/r-140.html> (last visited Dec. 1, 2009).

¹⁷ U.S. ENVTL. PROT. AGENCY, *supra* note 16, at iii-iv.

economic and social disruption,’ and Mobil ‘severe supply chain disruptions’ for gasoline. But no one rioted, the economy grew, and Americans never had a problem filling up their tanks.”¹⁸

III. The Clean Air Act Is a Highly Cost-Effective Tool to Regulate Greenhouse Gases from All Major Sources in the U.S.

Despite these lessons of the past, naysayers continue to claim that regulation of greenhouse gases under the Clean Air Act is unworkable or inappropriate. They argue that the Clean Air Act is “broken,” unsuitable to the regulation of greenhouse gases, or that regulation will be too expensive.¹⁹ These arguments, however, are unsupported and contradicted by EPA’s data and analysis, and are no more correct today than they were when the Clean Air Act was first enacted.

Initially, it should be noted that most of the industries that will be affected by greenhouse gas controls are already regulated under the Clean Air Act to control other pollutants they emit; as a result, the application of the same general procedures to limit emissions of another set of pollutants will result in fewer additional costs.²⁰ Moreover, regardless of start-up or ongoing regulatory costs, a robust economics literature demonstrates that greenhouse pollution reduction will have a net economic benefit. The Stern Review of the Economics of Climate Change, a comprehensive report commissioned by the British government, concluded that allowing current greenhouse gas emissions trajectories to continue unabated would cost the global economy between 5 to 20 percent of Gross Domestic Product (GDP) each year within a decade, or up to \$7 trillion per year, and warned that these figures should be considered conservative estimates.²¹ By contrast, measures to mitigate global warming by reducing emissions were estimated to cost about one percent of global GDP each year, and could save the world up to \$2.5 trillion per

¹⁸ HENRY WAXMAN WITH JOSHUA GREEN, *THE WAXMAN REPORT: HOW CONGRESS REALLY WORKS* 101-102 (Twelve/Grand Central Publishing 2009).

¹⁹ *See, e.g.*, Advance Notice of Proposed Rulemaking Regulating Greenhouse Gas Emissions Under the Clean Air Act, Proposed Rule, 73 Fed. Reg. 44354, 44356 (July 30, 2008).

²⁰ As EPA also noted, “[t]he electricity generation, transportation and industrial sectors, the three largest contributors to GHG emission in the U.S., are subject to Clean Air Act controls to help meet national ambient air quality standards, control acid rain, and reduce exposures to toxic emissions.” *Id.* at 44407. For example, coal-fired power plants must already comply with emissions limits applicable to nitrous oxides, sulfur dioxides and other pollutants, and they must purchase and maintain equipment to monitor their emissions. *See, e.g.*, Standards of Performance for Electric Utility Steam Generating Units, 74 Fed. Reg. 5072 (Jan. 28, 2009) (to be codified at 40 C.F.R. Part 60). Similarly, dry cleaning plants, sometimes invoked as an example of an industry that could not financially withstand greenhouse emission controls, have long been regulated to reduce pollutants they create but have found innovative ways to perform their services while reducing that pollution. *See, e.g.*, Standards of Performance for New Stationary Sources; Perchloroethylene Dry Cleaners, 45 Fed. Reg. 78174 (Nov. 25, 1980) (to be codified at 40 CFR Part 60). In any event, sources emitting less than 25,000 tons of CO₂eq per year will not initially be required to obtain prevention of significant deterioration, non-attainment or Title V permits under EPA’s proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 Fed. Reg. 55292 (Oct. 27, 2009) (to be codified at 40 CFR Parts 51, 52, 70, and 71) (hereinafter referred to as “the Tailoring Rule”). A national pollution cap for greenhouse gases will invoke the same basic mechanisms for pollution reduction. The application of already existing and well-understood Clean Air Act pollution control processes to another set of pollutants – greenhouse gases – will thus involve fewer start-up costs and create fewer inefficiencies than those experienced during the initial implementation of the Clean Air Act, or those that would attend the implementation of a different, unproven set of regulations.

²¹ SIR NICHOLAS STERN, *STERN REVIEW ON THE ECONOMICS OF CLIMATE CHANGE* (Cambridge University Press 2006), *available at* <http://www.sternreview.org.uk>.

year.²² If no action to control emissions is taken, each ton of carbon dioxide emitted today is causing societal damage worth at least \$85.²³ Thus economic analysis demonstrates convincingly that nothing could be more costly than continued “business-as-usual” greenhouse gas emissions, while greenhouse gas pollution reduction measures will produce vast economic benefits.

A recent survey of leading economists confirmed the weight of the economic argument for action: 84% of respondents agreed or strongly agreed that “the environmental effects of greenhouse gas emissions, as described by leading scientific experts, create significant risks to important sectors of the United States and global economies.” Seventy-five percent agreed or strongly agreed that “uncertainty associated with the environmental and economic effects of greenhouse gas emissions increases the value of emission controls, assuming some level of risk-aversion.” And 57% believed that the U.S. government should commit to greenhouse gas reductions “regardless of the actions of other countries.”²⁴

Thus, despite the fact that cost benefit analysis tends to understate the true benefits of protecting the air we breathe, the water we drink, and the food we eat²⁵, even this method demonstrates the cost effectiveness of greenhouse pollution reduction measures.

The actions requested in this petition are consistent with and additive to EPA’s multiple existing obligations to regulate greenhouse gases under the Clean Air Act pursuant to other rulemakings and proceedings. These obligations include, but are not limited to the following:

- The obligation to immediately finalize the proposed Endangerment Finding and begin regulating greenhouse gas emissions from motor vehicles pursuant to Clean Air Act Section 202.
- The obligation to immediately issue an endangerment finding and begin regulating GHG emissions from ships and off-road engines pursuant to Clean Air Act section 213.
- The obligation to immediately issue an endangerment finding and begin regulating greenhouse gas emissions from aircraft pursuant to Clean Air Act section 231.
- The obligation to update existing New Source Pollution Standards, and issue new standards, as necessary to include limits and reduction measures for greenhouse gases pursuant to Clean Air Act section 111.

²² *Id.*

²³ *Id.*

²⁴ J. SCOTT HOLLADAY ET AL., NEW YORK UNIV. SCH. OF LAW INST. FOR POLICY INTEGRITY, ECONOMISTS AND CLIMATE CHANGE, CONSENSUS AND OPEN QUESTIONS (2009), *available at* <http://www.policyintegrity.org/publications/index.html>.

²⁵ *See, e.g.*, RENA STEINZOR ET AL., CTR. FOR PROGRESSIVE REFORM, A RETURN TO COMMON SENSE: PROTECTING HEALTH, SAFETY, AND THE ENVIRONMENT THROUGH “PRAGMATIC REGULATORY IMPACT ANALYSIS” (2009), *available at* <http://www.progressivereform.org/whitePapers.cfm>.

- The obligation to immediately begin regulating greenhouse gases pursuant to the New Source Review program.

ARGUMENT IN SUPPORT OF PETITIONED ACTIONS

I. EPA Must Issue an Endangerment Finding for Greenhouse Gas Emissions Pursuant to Section 108

The program established by sections 108-110 (42 U.S.C. §§ 7408-410) is designed to work in a complementary and additive manner with many of the Act's other provisions. Section 108 (42 U.S.C. § 4708) requires EPA to list air pollutants that are emitted by many sources and that cause or contribute to air pollution problems. Within 12 months of adding a pollutant to the list, EPA must issue air quality criteria which specify all of its known effects on the public health and welfare. EPA is then required to set national pollution caps (national ambient air quality standards, or NAAQS) for each such "criteria pollutant" as necessary to protect the public health and welfare, pursuant to section 109 (42 U.S.C. § 4709). Under section 110 (42 U.S.C. § 4710), each state must develop and implement a state implementation plan to meet the national pollution cap through enforceable emissions controls for pollution sources within the state. Other complementary provisions aid the states in meeting the national pollution cap through additional requirements for stationary and mobile pollution sources.

This national pollutant cap program is among the most successful programs established by the Clean Air Act and has a proven record of accomplishment in effectively dealing with complex air pollution problems that implicate a multitude of sources and a wide range of economic activities. Through their previous experience with the state implementation plans for other criteria pollutants, states have significant expertise with the national pollution caps and have effectively utilized state implementation plans to regulate those pollutants. The substantial knowledge, experience and capacity that currently exist can and must be put to use to address greenhouse gases.

A. The Section 108 Endangerment Finding

Section 108(a)(1) (42 U.S.C. § 4708(a)(1)) establishes the threshold test for listing criteria air pollutants:

(1) For the purpose of establishing national primary and secondary ambient air quality standards [national pollution caps] the Administrator shall within 30 days after December 31, 1970, publish, and shall from time to time thereafter revise, a list which includes each air pollutant –

(A) emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare;

(B) the presence of which in the ambient air results from numerous or diverse mobile or stationary sources; and

(C) for which air quality criteria had not been issued before December 31, 1970, but for which he plans to issue air quality criteria under this section.

The finding under section 108(a)(1)(A) (42 U.S.C. § 4708(a)(1)(A)) is known as the “endangerment finding.” In its proposed Endangerment Finding for greenhouse gas emissions from automobiles under section 2002, EPA has already concluded that greenhouse gas emissions endanger public health and welfare. And as discussed in section I.D., below, because the test’s subparts (B) and (C) have also been met, the EPA must promptly designate the greenhouse gases as criteria air pollutants as requested herein.

B. Data Sources and Climate Scenarios

EPA currently has more than sufficient information and analysis to issue the endangerment finding required by section 108 (42 U.S.C. § 4708). Much of this information is discussed in the proposed Endangerment Finding and the supporting documents in Docket OAR-2009-0171, the Advance Notice of Proposed Rulemaking and Docket OAR-2008-0318, and the Supreme Court’s decision in *Massachusetts v. EPA*. This combined record contains more than enough evidence of the threat greenhouse gases pose to public health and welfare, and indeed compels EPA to make the Section 108 endangerment finding petitioned here immediately.

Authoritative synthesis reports and data sources which should form the foundation of the Section 108 endangerment finding include but are not limited to the following:

- The Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18886 (April 24, 2009) (hereinafter proposed Endangerment Finding);
- The Technical Support Document for the Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act (April 17, 2009), Docket No. OAR-2009-0171;
- The 2007 Fourth Assessment Report of the Intergovernmental Panel on Climate Change (“IPCC AR4”);²⁶

²⁶ The IPCC was established by the World Meteorological Organization and the United Nations Environment Programme in 1988 to assess available scientific and socio-economic information on climate change and its impacts and the options for mitigating climate change and to provide, on request, scientific and technical advice to the Conference of the Parties to the United Nations Framework Convention on Climate Change. Since 1990, the IPCC has produced a series of reports, papers, methodologies, and other products that have become the standard works of reference on climate change. The *Fourth Assessment Report* (AR4), cited as supporting evidence in the proposed Endangerment Finding, is the most current comprehensive IPCC reference and has built and expanded upon the IPCC’s past products. Thousands of the world’s top scientists and hundreds of coordinating lead authors contributed to the AR4, which also underwent a painstaking review process in which every comment received was addressed. Each Summary for Policymakers in IPCC documents, including the AR4, is approved line-by-line, and the PETITION TO ESTABLISH NATIONAL POLLUTION LIMITS FOR GREENHOUSE GASES
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- An updated report prepared by the Climate Change Research Centre at the University of New South Wales, synthesizing peer-reviewed scientific articles published since the release of IPCC AR4;²⁷
- The Synthesis and Assessment Products of the U.S. Global Change Research Program (formerly the Climate Change Science Program);²⁸
- National Research Council (“NRC”) reports under the U.S. National Academy of Sciences (“NAS”);²⁹
- The Arctic Climate Impact Assessment (“ACIA”);³⁰

underlying chapters are then accepted, by government delegations in formal plenary sessions. The AR4 represents an extraordinary and unprecedented level of scientific effort and coordination, but is also therefore a highly conservative consensus document. Further information about the IPCC process and reports is available at <http://www.ipcc.ch/about/procd.htm>.

²⁷ I. ALLISON ET AL., THE COPENHAGEN DIAGNOSIS 2009: UPDATING THE WORLD ON THE LATEST CLIMATE SCIENCE (2009), available at <http://copenhagendiagnosis.org/>.

²⁸ Pursuant to the requirements of the Global Change Research Act of 1990, 15 U.S.C. §§ 2921-2961 (“GCRA”), the Global Change Research Program (GCRP) is charged with preparing a scientific assessment of climate change impacts in the United States which must be used by all federal agencies in decisions which implicate greenhouse gas emissions and global warming. The GCRP released the most recent scientific assessment on May 29, 2008 (*Scientific Assessment of the Effects of Global Change on the United States*). The GCRP has also identified 21 synthesis and assessment products (SAPs) that address what it has identified as the highest priorities for U.S. climate change research, observation and decision-support needs; EPA is the designated lead for three of the six SAPs addressing impacts and adaptation. The EPA utilized those SAPs that were available at the time the endangerment TSD was drafted. In each Clean Air Act endangerment finding, the EPA must utilize the most recent GCRP synthesis documents, which are available at <http://www.globalchange.gov/>. The EPA did so in the proposed Endangerment Finding, 74 Fed. Reg. 18894. The GCRP, recently released an updated report on climate impacts in the United States that integrates existing SAPs with new peer-reviewed science. See U.S. GLOBAL CHANGE RESEARCH PROGRAM, GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES (2009), available at www.globalchange.gov/usimpacts.

²⁹ As the EPA has noted, “[t]he National Research Council (NRC) is part of the National Academies, which also comprise the National Academy of Sciences, National Academy of Engineering and Institute of Medicine. They are private, nonprofit institutions that provide science, technology and health policy advice under a congressional charter. The NRC has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public and the scientific and engineering communities. Federal agencies are the primary financial sponsors of the Academies’ work. The Academies provide independent advice; the external sponsors have no control over the conduct of a study once the statement of task and budget are finalized. The NRC 2001 study, *Climate Change Science: An Analysis of Some Key Questions*, originated from a White House request. The NRC 2001 study, *Global Air Quality: An Imperative for Long-Term Observational Strategies*, was supported by EPA and NASA. The NRC 2004 study, *Air Quality Management in the United States*, was supported by EPA. The NRC 2005 study, *Radiative Forcing of Climate Change: Expanding the Concept and Addressing Uncertainties*, was in response to a CCSP request, and supported by NOAA. The NRC 2006 study, *Surface Temperature Reconstructions for the Last 2,000 Years*, was requested by the Science Committee of the U.S. House of Representatives. Each NRC report is authored by its own committee of experts, reviewed by outside experts, and approved by the Governing Board of the NRC.” Endangerment Technical Support Document at 3.

³⁰ The Arctic Council is a high-level intergovernmental forum that addresses the common concerns and challenges faced by the Arctic people and governments of the eight Arctic nations – Canada, Denmark/Greenland/Faroe Islands, Finland, Iceland, Norway, Russia, Sweden, and the United States, as well as six Indigenous Peoples organizations – Aleut International Association, Arctic Athabaskan Council, Gwich’in Council International, Inuit

- The Global Humanitarian Forum's Human Impact Report Climate Change;³¹
- Climate Change Futures: Health, Ecological, and Economic dimensions, a report of the Center for Health and the Global Environment, Harvard Medical School;³²
- EPA annual report on U.S. greenhouse gas emission inventories.

The proposed Endangerment Finding lists some of the overwhelming evidence supporting a finding of endangerment. Because the proposed Endangerment Finding conclusions compel the same action under Section 108(a) (42 U.S.C. § 4708(a)), they are summarized in Section C below. The following discussion of basic climate change concepts and scenarios is included to clarify the context of the proposed endangerment finding.

C. EPA Must Find Under Section 108(a) that Greenhouse Gas Emissions Cause or Contribute to Air Pollution Which Endangers Public Health and Welfare, As EPA Has Already Determined Under Section 202(a)

Under Section 108(a) (42 U.S.C. § 4708(a)), EPA must set a national pollution cap for greenhouse gases if it finds that greenhouse gases are air pollutants which cause or contribute to air pollution which may “reasonably be anticipated to endanger public health or welfare.” The Clean Air Act defines “welfare” as referring to effects including, but not limited to, “effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.”³³ While the Clean Air Act does not include a definition of public health, the Supreme Court has defined that term in its most natural meaning: “the health of the public.”³⁴ In considering public health, “EPA has looked at morbidity, such as impairment of lung function, aggravation of respiratory and cardiovascular disease, and other acute and chronic health effects, as well as mortality.”³⁵ Using these

Circumpolar Conference, Russian Association of Indigenous Peoples of the North, and Saami Council, as well as official observers. The Arctic Council commissioned the ACIA project and charged its working groups – Arctic Monitoring and Assessment Programme (“AMAP”), Conservation of Arctic Flora and Fauna (“CAFF”), and the International Arctic Science Committee (“IASC”) - with its implementation. The efforts of hundreds of scientists over four years, as well as the special knowledge of indigenous peoples, contributed to the ACIA report. The ACIA (2005) is a comprehensively researched, fully referenced, and independently reviewed evaluation of Arctic climate change and its impacts.

³¹ GLOBAL HUMANITARIAN FORUM, HUMAN IMPACT REPORT, CLIMATE CHANGE: THE ANATOMY OF A SILENT CRISIS (2009), available at http://ghfgenewa.org/Portals/0/pdfs/human_impact_report.pdf (documenting the impact of climate change on human life globally).

³² HARVARD MED. SCHOOL CTR. FOR HEALTH AND THE GLOBAL ENV'T, CLIMATE CHANGE FUTURES HEALTH, ECOLOGICAL, AND ECONOMIC DIMENSIONS (2005), available at http://www.climatechange-futures.org/pdf/CCF_Report_Final_10.27.pdf.

³³ Clean Air Act § 302, 42 U.S.C. § 7602(h) (2008).

³⁴ *Whitman v. American Trucking Ass'n*, 531 U.S. 457, 466 (2001).

³⁵ Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18886, 18894 (April 24, 2009) (to be codified in 40 C.F.R. Chapter 1).

definitions, the EPA's proposed Endangerment Finding found irrefutable evidence demonstrating that greenhouse gases endanger public health and welfare.

As stated in the proposed Endangerment Finding,

*The Administrator concludes that, in the circumstances presented here, the case for finding that greenhouse gases in the atmosphere endanger public health and welfare is compelling and, indeed, overwhelming. The scientific evidence described here is the product of decades of research by thousands of scientists from the U.S. and around the world. The evidence points ineluctably to the conclusion that climate change is upon us as a result of greenhouse gas emissions, that climate changes are already occurring that harm our health and welfare, and that the effects will only worsen over time in the absence of regulatory action. The effects of climate change on public health include sickness and death. It is hard to imagine any understanding of public health that would exclude these consequences. The effects on welfare embrace every category of effect described in the Clean Air Act's definition of "welfare" and, more broadly, virtually every facet of the living world around us. And, according to the scientific evidence relied upon in making this finding, the probability of the consequences is shown to range from the likely to virtually certain to occur. This is not a close case in which the magnitude of the harm is small and the probability great, or the magnitude large and the probability small. In both magnitude and probability, climate change is an enormous problem. The greenhouse gases that are responsible for it endanger public health and welfare within the meaning of the Clean Air Act.*³⁶

EPA summarized some of the overwhelming evidence concerning the effects of climate change on health and welfare that have *already* occurred:

Effects on oceans and global sea levels: "Observations from all continents and most oceans show that many natural systems are being affected by regional climate changes, particularly temperature increases. Observations show that changes are occurring in the amount, intensity, frequency, and type of precipitation. There is strong evidence that global sea level gradually rose in the 20th century and is currently rising at an increased rate."³⁷

Loss of Arctic sea ice: "The latest data from NASA indicate Arctic sea ice set a record low in September 2007, 38 percent below the 1979-2007 average. In September 2008, Arctic sea ice reached its second lowest extent on record."³⁸

Drastic temperature increases: "U.S. average annual temperatures are approximately 1.25 °F (0.69 °C) warmer than at the start of the 20th century, with an increased rate of warming over the past 30 years. . . . [T]he rate of warming

³⁶ *Id.* at 18904 (emphasis added).

³⁷ *Id.* at 18898.

³⁸ *Id.*

increased to 0.58 °F/decade (0.32 °C/decade) for the period from 1979-2008. [¶] The last ten 5-year periods . . . were the warmest 5-year periods in the 114 years of national records, demonstrating the anomalous warmth of the last 15 years.”³⁹

Degradation of water and land resources, agriculture and biodiversity: “Climate changes are very likely already affecting U.S. water resources, agriculture, land resources, and biodiversity as a result of climate variability and change. A 2008 CCSP report that examined these observed changes concluded: ‘[t]he number and frequency of forest fires and insect outbreaks are increasing in the interior West, the Southwest, and Alaska. Precipitation, stream flow, and stream temperatures are increasing in most of the continental U.S. The western U.S. is experiencing reduced snowpack and earlier peaks in spring runoff. The growth of many crops and weeds is being stimulated. Migration of plant and animal species is changing the composition and structure of arid, polar, aquatic, coastal, and other ecosystems.’”⁴⁰

Extreme weather events: “‘Many extremes and their associated impacts are now changing. For example, in recent decades most of North America has been experiencing more unusually hot days and nights, fewer unusually cold days and nights, and fewer frost days. Heavy downpours have become more frequent and intense. . . . The power and frequency of Atlantic hurricanes have increased substantially in recent decades.’”⁴¹

As to the devastating *future* climate change impacts on health and welfare, EPA observed:

Increasing temperatures: “By the end of the century, projected average global warming ranges (compared to average temperature around 1990) varies significantly depending on emissions scenario and climate sensitivity assumptions, ranging from 1.8 to 4.0 °C (4.3 to 7.2 °F), with an uncertainty range of 1.1 to 6.4 °C (2.0 to 11.5 °F), according to the IPCC.”⁴²

Increased droughts and decreased water availability: “Drought is expected to increase in the western U.S., where water availability to meet demands for agricultural and municipal water needs is already limited. Another projected impact in the western U.S. is decreased water availability due to a range of interconnected factors. These include: decreases in snowpack, earlier snowmelt resulting in peak winter and decreased summer flows, which will disrupt and limit water storage capacity and will create additional challenges for water allocation among competing uses...”⁴³

³⁹ *Id.* at 18898-99.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.* at 18900.

Sea level rises: “By the end of the century, sea level is projected to rise between 0.18 and 0.59 meters relative to around 1990 in the absence of increased dynamic ice sheet loss. Recent rapid changes at the edges of the Greenland and West Antarctic ice sheets show acceleration of flow and thinning. [¶¶] As the climate warms, glaciers will lose mass owing to dominance of summer melting over winter precipitation increases, contributing to sea level rise”⁴⁴

Floods: “The U.S. is projected to see an increase in the intensity of precipitation events, which is likely to increase the risk of flood events...”⁴⁵

Increased morbidity and mortality: “Severe heat waves are projected to intensify in magnitude and duration over the portions of the U.S. where these events already occur, with likely increases in mortality and morbidity. The populations most sensitive to hot temperatures are older adults, the chronically sick, the very young, city-dwellers, those taking medications that disrupt thermoregulation, the mentally ill, those lacking access to air conditioning, those working or playing outdoors, and the socially isolated.”⁴⁶

Increased spread of diseases: “There will likely be an increase in the spread of several food and water-born pathogens (e.g., Salmonella, Vibrio) among susceptible populations. . . . The primary climate-related factors that affect these pathogens include temperature, precipitation, extreme weather events, and shifts in their ecological regimes.”⁴⁷

Crop failures and reduced livestock production: “[W]ith increased CO₂ and temperature, the life cycle of grain and oilseed crops will likely progress more rapidly. But, as temperature rises, these crops will increasingly begin to experience failure . . . [¶] Higher temperatures will very likely reduce livestock production during the summer season, but these losses will very likely be partially offset by warmer temperatures during the winter season. [¶] In addition to human health effects, tropospheric ozone increases as a result of temperature increases and other climatic changes can have significant adverse effects on crop yields, pasture and forest growth and species composition.”⁴⁸

Damage to water infrastructure: “Water infrastructure, including drinking water and wastewater treatment plants, and sewer and stormwater management systems, may be at greater risk of flooding, sea level rise and storm surge, low flows, and other factors that could impair functioning.”⁴⁹

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Id.* at 18901.

⁴⁷ *Id.*

⁴⁸ *Id.* at 18902.

⁴⁹ *Id.*

Ocean acidification: “Ocean acidification is projected to continue, resulting in the reduced biological production of marine calcifiers, including corals.”⁵⁰

The proposed Endangerment Finding also highlights important findings concerning the international impact of global warming, including the following:

“The IPCC identifies the most vulnerable world regions as the Arctic, because of high rates of projected warming on natural systems; Africa, especially the sub-Saharan region, because of current low adaptive capacity (e.g., lack of infrastructure and resources) as well as climate change; small islands, due to high exposure of population and infrastructure to risk of sea-level rise and increased storm surge; and Asian mega deltas, due to large populations and high exposure to sea level rise, storm surge and river flooding.”⁵¹

“On a global basis, according to the IPCC, projected climate change-related impacts are likely to affect the health of millions of people, particularly those with low adaptive capacity, as a result of a number of factors including increased cardio respiratory diseases due to higher concentrations of ground-level ozone brought on by higher temperatures, and by more frequent and intense heat waves.”⁵²

“Climate change impacts in certain regions of the world may exacerbate problems that raise humanitarian, trade and national security issues for the U.S. Climate change has been described as a potential threat multiplier regarding national security issues. This is because . . . climate change can aggravate existing problems . . . such as poverty, social tensions, general environmental degradation, and conflict over increasingly scarce water resources.”⁵³

As demonstrated by the above summary of EPA’s own findings, and as overwhelmingly proven by the literature pertaining to the two statutory factors, greenhouse gases endanger public health and welfare. The statutory language concerning the requisite endangerment findings under sections 202(a) (42 U.S.C. § 7521(a)) and 108(a) (42 U.S.C. § 7408(a)) is near-identical. In light of the proposed Endangerment Finding under section 202(a), there can be no doubt that EPA must issue the same endangerment finding under section 108(a)(1)(A)).

The condition of subpart (B) of section 108(a)(1) is also satisfied as greenhouse gases plainly result from numerous and diverse mobile and stationary sources. As EPA has recognized, greenhouse gases are emitted from millions of sources throughout the nation and across all sectors of the economy, including all mobile sources of fossil fuel, home and commercial heating and cooking with oil, natural gas and coal, land use changes, industrial

⁵⁰ *Id.*

⁵¹ *Id.* at 18903.

⁵² *Id.*

⁵³ *Id.*

processes such as cement and ammonia manufacturing, and industrial energy generation units.⁵⁴ The listing criteria of Section 108(1)(A) and (B) are indubitably met.

D. Because All Prongs of Section 108(a)(1) Are Satisfied, EPA Must Expeditiously Designate Greenhouse Gases as Criteria Air Pollutants

Because greenhouse gases meet the listing provisions under Section 108(a)(1) (42 U.S.C. § 7408(a)), EPA must designate greenhouse gases as criteria air pollutants. When the provisions of subpart (A) and (B) have been met, listing the pollutant and proceeding with the additional requirements of sections 108-110 is mandatory, and EPA lacks any discretion to decline to regulate.

The mandatory nature of EPA's listing obligation was explained by the Second Circuit in *NRDC v. Train*, 545 F.2d 320 (2d Cir. 1976). The Court considered whether EPA had discretion not to proceed with listing lead as a criteria pollutant despite an endangerment finding because subsection (C) states that an air quality criteria is required for any pollutant "for which air quality criteria had not been issued before December 31, 1970, but for which [the Administrator] plans to issue air quality criteria under this section." The court in *Train* held conclusively that no discretion exists: "[o]nce the conditions of [Sections] 108(a)(1)(A) and (B) have been met, the listing of lead and the issuance of air quality standards for lead become mandatory."⁵⁵ In the matter at hand, the air pollutants in question are greenhouse gases. If the conditions of the first two criteria are satisfied for greenhouse gases, then the Administrator has no discretion in whether to make an endangerment finding, issue air quality criteria, national pollutant caps, and follow the other mandatory provisions of Clean Air Act sections 108 through 110.

E. EPA Must Comply with the other Mandatory Requirements of Section 108

Once EPA has listed the greenhouse gases as criteria air pollutants, the EPA must issue air quality criteria specifying the impact of those pollutants on the public health and welfare. Section 108(a)(2) provides as follows:

Shall issue air quality criteria for an air pollutant within 12 months after [EPA] has included such pollutant in a list under paragraph (1). Air quality criteria for an air pollutant *shall accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air*, in varying quantities. The criteria for an air pollutant, to the extent practicable, shall include information on –

(A) those variable factors (including atmospheric conditions) which of themselves or in combination with other factors may alter the effects on public health or welfare of such air pollutant;

(B) the types of air pollutants which, when present in the atmosphere, may interact with such pollutant to produce an adverse effect on public health or welfare; and

⁵⁴ 73 Fed. Reg. at 44401, 44403, 44429-437, 44453-454, 44462, 44468; *see also* 74 Fed. Reg. 18886, 18907.

⁵⁵ *Train*, 545 F.2d. at 328.

(C) any known or anticipated adverse effects on welfare.

42 U.S.C. 7408(a)(2) (emphasis added).

Simultaneously with the release of the air quality criteria, section 108(b)(1) requires EPA to issue “information on air pollution control techniques, which information shall include data relating to the cost of installation and operation, energy requirements, emission reduction benefits, and environmental impact of the emission control technology.”⁵⁶

Additionally, section 108(f) requires EPA to:

Publish and make available to appropriate Federal, State, and local environmental and transportation agencies not later than one year after November 15, 1990, and from time to time thereafter . . . information regarding processes, procedures, and methods to reduce or control pollutants in transportation; reduction of mobile source related pollutants; reduction of impact on public health.

Section 108(f) provides a non-exhaustive list of sixteen categories of information that EPA must provide, after consultation with the Secretary of Transportation and a public comment period, “regarding the formulation and emission reduction potential of transportation control measures related to criteria pollutants and their precursors.”

Again simultaneously with publication of the air quality criteria, EPA must also publish proposed air quality standards for the pollutant pursuant to section 109 (42 U.S.C. § 7409), as discussed below.

II. EPA Must Establish Science-Based National Pollution Caps to Protect the Public Health and Welfare

Once a pollutant is listed pursuant to section 108(a)(1), EPA must establish national pollution caps sufficient to protect the public health and welfare. Specifically, EPA “shall publish, simultaneously with the issuance of such criteria and information, proposed national primary and secondary ambient air quality standards for any such pollutant” (NAAQS) in order to protect the public health and welfare.⁵⁷ EPA must finalize the national pollutant caps no later than 90 days from the initial publication, following public review and comment on the proposal.⁵⁸

⁵⁶ Clean Air Act § 108(b)(1), 42 U.S.C. § 7408(b)(1) (2008).

⁵⁷ Clean Air Act § 109(a)(2), 42 U.S.C. § 7409(a)(2) (2008). In the Advance Notice of Proposed Rulemaking for greenhouse gases, the EPA advanced the theory that it might have discretion to decline to set primary and/or secondary pollution caps for greenhouse gases, either because there are no public health or welfare impacts at current ambient greenhouse gas concentrations, or because health impacts are indirect and “largely incidental” to welfare impacts. 73 Fed. Reg. at 44426-44427. EPA itself has now definitively rejected these contentions in the proposed Endangerment Finding. EPA must issue both primary and secondary pollution caps for greenhouse gases.

⁵⁸ Clean Air Act § 109(a)(1)(B), 42 U.S.C. § 7409(a)(1)(B) (2008).

The primary national pollution caps (NAAQS) are “ambient air quality standards the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health.”⁵⁹

The secondary national pollution caps (NAAQS) “shall specify a level of air quality the attainment and maintenance of which in the judgment of the Administrator, based on such criteria, is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.”⁶⁰ As discussed above, the Clean Air Act defines “welfare” as:

All language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants.⁶¹

As discussed above, the scientific literature reflects, and EPA has recognized, a wide array of current and projected global and U.S. health and welfare effects. The only remaining question is the level at which the national pollution limits must be set to adequately protect the public health and welfare.

A. Pollutants Subject to this Petition

The sources and properties of the pollutants subject to this petition are discussed extensively in the IPCC’s Fourth Assessment Report and in the other primary source documents listed above. Some of the key properties of the petitioned pollutants are summarized in Table 1.

⁵⁹ Clean Air Act § 109(b)(1), 42 U.S.C. § 7409(b)(1) (2008).

⁶⁰ Clean Air Act § 109(b)(2), 42 U.S.C. § 7409(b)(2) (2008).

⁶¹ Clean Air Act § 302(h), 42 U.S.C. § 7602(h) (2008).

Table 1: Key Properties of Petitioned Pollutants

Pollutant ^a	Atmospheric Lifetime (years)	GWP ^b 20-yr	GWP 100-yr	GWP 500-yr	Pre-Industrial Concentration	Current Concentration ^c
Carbon Dioxide (CO₂)	<i>See note d</i>	1	1	1	275-285 ppm ^e	385.2 ^f ppm (2008)
Methane (CH₄)	12	72	25	7.6	715 ppb ^g	1797 ^f ppb (2008)
Nitrous Oxide (N₂O)	114	289	298	153	270 ppb	321.8 ^f ppb (2008)
Hydrofluorocarbons (HFCs)^j	1.4-270					
HFC-125	29	6,350	3,500	1,100	0	3.7 ppt ⁱ
HFC-134a	14	3,830	1,430	435	0	35 ppt
HFC-152a	1.4	437	124	38	0	3.9 ppt
HFC-23	270	12,000	14,800	12,200	0	18 ppt
Perfluorocarbons (PFCs)^j						
PFC-14	50,000	5,210	7,390	11,200	0	74 ppt
PFC-116	10,000	8,630	12,200	18,200	0	2.9 ppt
Sulfur hexafluoride (SF₆)	3,200	16,300	22,800	32,600	0	5.6 ppt
Nitrogen Trifluoride	740	12,300	17,200	20,700	0	0.454 ^k ppt (2008)

^a Unless otherwise noted, data from P. Forster et al., *Changes in Atmospheric Constituents and in Radiative Forcing*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Solomon, S., et al. eds., Cambridge University Press 2007).

^b direct, global mean Global Warming Potential (see discussion of GWPs, *supra*).

^c 2005 value unless otherwise noted.

^d It is not possible to give a single lifetime for CO₂, but research has highlighted its long residence time. While approximately half of the carbon emitted is removed by the natural carbon cycle within a century, a substantial fraction of anthropogenic CO₂ will persist in the atmosphere for several millennia. *See, e.g.,* A. Montenegro et al., *Long Term Fate of Atmospheric Carbon*, 34 GEOPHYS. RES. LETT. L19707 (2007) (25% of emitted CO₂ will have an atmospheric lifetime of more than 5000 years); S. Solomon et al., *Irreversible Climate Change Due to Carbon Dioxide Emissions*, 106 PNAS 1704 (2009).

^e parts per million.

^f World Meteorological Organization (WMO), WMO Greenhouse Gas Bulletin. No. 5: 23 (Nov. 2009), available at <http://www.wmo.int/pages/prog/arep/gaw/ghg/GHGbulletin.html>.

^g parts per billion.

ⁱ parts per trillion.

^j Petitioners seek regulation of all HFCs and PFCs for which either significant concentrations or large trends in concentrations have been observed or a clear potential for future emissions has been identified. Appendix A provides a complete list of the petitioned HFCs and PFCs. The compounds with the greatest contribution to global warming are included here for illustrative purposes.

^k Weiss et al., *supra* note 62.

Nitrogen trifluoride is the only gas not discussed in the proposed Endangerment Finding, and not extensively treated in the AR4 and other source documents, as it has only recently been measured in the atmosphere. Nitrogen trifluoride is used in the electronics industry for equipment cleaning, for the etching of microcircuits, and for manufacturing liquid crystal flat panel displays and thin-film photovoltaic cells.⁶² It is not included in the reporting requirements or restricted under the U.S. Framework Convention on Climate Change process, and has therefore increasingly been used as a replacement for PFCs which are covered under the Convention and Kyoto Protocol.⁶³ Scientists have recently measured nitrogen trifluoride levels of 0.454 ppt, a quasi-exponential growth from about 0.02 ppt in 1978.⁶⁴ The rise corresponds to about 620 metric tons of emissions per year, or about 16% of the poorly-constrained global production estimate of 4,000 metric tons per year.⁶⁵ As discussed below, although nitrogen trifluoride is currently a small contributor to global warming, EPA must regulate it due to its increasing use, high global warming potential, and long atmospheric lifetime.⁶⁶

B. The Latest Scientific Knowledge Supports a National Pollution Limit for Carbon Dioxide of No More than 350 Parts per Million

The national pollution cap established by EPA must be science-based and sufficient to protect the public health and welfare. The Clean Air Act also embodies a precautionary approach of considering the likelihood that emerging science will demonstrate a need for a lower threshold level as uncertainties are resolved. This idea is explicitly invoked through the “adequate margin of safety” language of section 109(b)(1).

As the Supreme Court stated in *Whitman v. American Trucking Associations*, “EPA, ‘based on’ the information about health effects contained in the technical ‘criteria’ documents compiled under section 108(a)(2), 42 U.S.C. § 7408(a)(2), is to identify the maximum airborne

⁶² R. F. Weiss et al., *Nitrogen Trifluoride in the Global Atmosphere*, 35 GEOPHYS. RES. LETT. L20821 (Oct. 2008), available at <http://www.agu.org/pubs/crossref/2008/2008GL035913.shtml>.

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ In the proposed Endangerment Finding, EPA determined without question that the six other greenhouse gases subject to this petition cause and contribute to air pollution even though the individual contribution of any one greenhouse gas may be deemed small: “Importantly, because no single greenhouse gas source category dominates on the global scale, many (if not all) individual greenhouse gas source categories could appear too small to matter, when in fact, they could be very significant contributors in terms of both absolute emissions or in comparison to other similar source categories within the U.S. If the U.S. and the rest of the world are to combat the risks associated with global climate change, contributors must do their part even if their contributions to the global problem, measured in terms of percentage, are smaller than typically encountered when tackling solely regional or local environmental issues.” 74 Fed. Reg. 18907. For that reason, and because of the potency and longevity of individual greenhouse gases, the Administrator determined that if she were to evaluate any of the greenhouse gases as a separate air pollutant, she would nonetheless find them to “cause or contribute” to air pollution. For example, the Administrator found methane to contribute to air pollution under section 202(a) even though in 2006, methane emissions from section 202(a) source categories were 0.03 percent of total U.S. greenhouse gas emissions and less than 0.01 percent of total global greenhouse gas emissions in 2005. 74 Fed. Reg. 18908. Similarly, because of nitrogen trifluoride’s long atmospheric lifetime (740 years), extremely potent global warming potential (17,200 times more powerful than carbon dioxide over a 100 year period) and exponential increase in atmospheric concentrations in recent years, EPA should arrive at the same conclusion here.

concentration of a pollutant that the public health can tolerate, decrease the concentration to provide an ‘adequate’ margin of safety, and set the standard at that level.”⁶⁷ On remand, the Court of Appeals for the District of Columbia held that “EPA must err on the side of caution, . . . setting the NAAQS at whatever level it deems necessary and sufficient to protect the public health with an adequate margin of safety, taking into account both the available evidence and the inevitable scientific uncertainties.”⁶⁸

In considering the impacts from CO₂ and the other greenhouse gases, the EPA must consider, and accurately reflect, the “latest scientific knowledge.”⁶⁹ The latest scientific knowledge supports a national pollution cap of no more than 350 parts per million for CO₂. Leading climate scientists, publishing in a peer-reviewed scientific journal, have concluded that the present concentration of 385 ppm CO₂, is “already in the dangerous zone.”⁷⁰ Their findings are briefly summarized as follows:

If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ will need to be reduced from its current 385 ppm to at most 350 ppm, but likely less than that. The largest uncertainty in the target arises from possible changes of non-CO₂ forcings. An initial 350 ppm CO₂ target may be achievable by phasing out coal use except where CO₂ is captured and adopting agricultural and forestry practices that sequester carbon. If the present overshoot of this target CO₂ is not brief, there is a possibility of seeding irreversible catastrophic effects.⁷¹

Atmospheric CO₂ concentrations must be reduced quickly: “Indeed, if the world continues on a business-as-usual path for even another decade without initiating phase-out of unconstrained coal use, prospects for avoiding a dangerously large, extended overshoot of the 350 ppm level will be dim.”⁷²

The many other statements from scientists and lines of evidence in support of a pollution cap of no more than 350 ppm CO₂ include the following:

- Dr. Rajendra Pachauri, chairman of the Intergovernmental Panel on Climate Change, personally endorsed a 350ppm target: “What is happening, and what is likely to happen, convinces me that the world must be really ambitious and very determined at moving toward a 350 target.”⁷³

⁶⁷ *Whitman*, 531 U.S. at 465.

⁶⁸ *American Trucking Associations, Inc. v. EPA*, 283 F.3d 355, 378 (D.C. Cir. 2002).

⁶⁹ Clean Air Act § 108(a)(2), 42 U.S.C. § 7408(a)(2).

⁷⁰ J. Hansen et al., *Target Atmospheric CO₂: Where Should Humanity Aim?*, 2 OPEN ATMOSPHERIC SCI. J. 217, 218 (2008).

⁷¹ *Id.* at 217. Because climate forcing from anthropogenic non-CO₂ greenhouse emissions are approximately offset by the cooling effect of anthropogenic aerosol emissions, Hansen et al. (2008) consider future CO₂ change as approximating the net human-made forcing change, with several caveats.

⁷² *Id.* at 227.

⁷³ Marlow Hood, *Top UN Climate Scientist backs Ambitious CO₂ Cuts*, AGENCE FRANCE PRESS, Aug. 28, 2009, available at <http://www.mg.co.za/article/2009-08-25-top-un-climate-scientist-backs-ambitious-co2-cuts>; see also PETITION TO ESTABLISH NATIONAL POLLUTION LIMITS FOR GREENHOUSE GASES DECEMBER 2, 2009 PAGE 20

- A United Nations project to quantify the financial costs of climate change on nature concluded that atmospheric CO₂ must be reduced to below 350 ppm to save the world's coral reefs:

Coral reef losses accelerated significantly once atmospheric concentrations of CO₂ reached around 320 ppm due to temperature-induced coral bleaching. These losses were compounded by excessive CO₂ dissolution in sea water. This caused ocean acidification, which in turn hampers reef regeneration. Scientific consensus has emerged that atmospheric CO₂ concentrations need to be “significantly below 350 ppm” for the long-term viability of coral reefs (Royal Society 2009)....[¶] Even current levels of atmospheric CO₂ are too high for coral reef survival. We need large and permanent removals of CO₂ from the atmosphere.... Accepting any stabilization target above 350 ppm CO₂ really means that society has made a decision to make do without coral reefs. It is therefore also a decision to accept the serious consequences of coral reef loss on biodiversity, on sea fisheries around the world, and on the half billion people who depend directly on coral reefs for their livelihoods. Removing CO₂ has thus become an imperative for survival.⁷⁴

- Twenty top climate scientists recently issued an open letter to President Obama and Congress to “call attention to the large difference between what U.S. politics now seems capable of enacting [targeting reduction to 450ppm] and what scientists understand is necessary to prevent climatic disruption and protect the human future...We and many others are of the view that these objectives [limiting CO₂ to 450 ppm and global temperature increase to 2° C] are inadequate to sustain the integrity of global climate and to hold the risk of ruinous climatic change to an acceptably low level.”⁷⁵

The best available science now indicates unequivocally that stabilizing CO₂ at 450 ppm with the goal of limiting warming to 2°C is not “safe” and will not protect public health and welfare. In 2001, the Intergovernmental Panel on Climate Change (IPCC) identified five “Reasons For Concern” in its Third Assessment Report to illustrate the temperature range at which impacts may be considered dangerous.⁷⁶ Relationships between the impacts reflected in each Reason For Concern and increases in global mean temperature were portrayed in a “burning embers” diagram, which reflected the severity of risk from rising temperature through gradations in color from white (no or little risk) to yellow (moderately significant risk) to red (substantial or

Yale Environment 360, *Amid Mounting Hope, a Voice of Hope for Copenhagen*, Nov. 4, 2009, <http://www.e360.yale.edu/content/feature.msp?id=2206> (last visited Dec. 1, 2009).

⁷⁴ THE ECONOMICS OF ECOSYSTEM BIODIVERSITY (TEEB), TEEB CLIMATE ISSUES UPDATE (Sept. 2009), *available at* <http://www.teebweb.org/InformationMaterial/PresentationTools/tabid/1053/language/en-US/Default.aspx>.

⁷⁵ Dean Abrahamson, An Open Letter to the President and Members of Congress Strong Leadership Needed Now on Climate (June 23, 2009).

⁷⁶ IPCC, CLIMATE CHANGE 2001: SYNTHESIS REPORT, SUMMARY FOR POLICYMAKERS 11 (2001), *available at* <http://www.ipcc.ch/pdf/climate-changes-2001/synthesis-spm/synthesis-spm-en.pdf>. The five Reasons For Concern identified in the Third Assessment Report are: 1) risks to unique and threatened systems; 2) risks of extreme weather events; 3) distribution of impacts; 4) aggregate impacts; and 5) risks of large scale discontinuities.

severe risk).⁷⁷ Depending on the Reason For Concern, the IPCC predicted that substantial impacts or risks (transition from yellow to red) would occur with a temperature rise 1–4°C above current levels.⁷⁸

Since the release of the Third Assessment Report, scientific understanding of the vulnerability of the climate to temperature rise has evolved considerably.⁷⁹ Based on new findings in the growing scientific literature, the burning embers diagram was revised in 2008 to reflect the dangerous risks posed by smaller increases in temperature than identified in the Third Assessment Report.⁸⁰ In the updated burning embers diagram, the IPCC now predicts that substantial impacts or risks occur at or near current temperature levels for a number of the Reasons For Concern.⁸¹ As reflected in the updated Reasons for Concern, a 2°C temperature increase from pre-industrial levels (or 1.4°C increase from 1990 levels) is well past the point where severe and irreversible impacts will occur.⁸²

It is now estimated that a mean global temperature increase of 1.5°C above pre-industrial levels has the potential to trigger irreversible melting of the Greenland ice sheet, a process that would result in an eventual seven meter sea level rise over and above that caused by thermal expansion of the oceans, and that could potentially cause an additional sea level rise of 0.75 meters, as soon as 2100.⁸³ Specific consequences of a 2°C temperature rise from pre-industrial levels include the loss of 97 percent of the world's coral reefs and the transformation of 16 percent of global ecosystems. Indeed, given increased confidence that a 1–2°C increase poses significant risks to many unique and threatened systems, including many biodiversity hotspots, the updated burning embers diagram indicates substantial impacts and/or moderate risks from warming that has already occurred.⁸⁴ At a 2°C temperature rise, approximately one to three billion people would experience an increase in water stress, sea level rise and cyclones would displace millions from the world's coastlines, and agricultural yields would fall in the developed world.⁸⁵ In the Arctic, ecosystem disruption is predicted upon expectations of a complete loss of summer sea ice, with only 42 percent of the tundra remaining stable. Such a disruption would

⁷⁷ *Id.*; see also Joel B. Smith et al., *Assessing Dangerous Climate Change Through an Update of the Intergovernmental Panel on Climate Change (IPCC) "Reasons for Concern,"* 106 PROC. OF THE NAT'L ACAD. SCI. 4133 (2009), available at <http://www.pnas.org/content/early/2009/02/25/0812355106.abstract>.

⁷⁸ IPCC, *supra* note 76. The Reasons For Concern assessed impacts from a baseline of 1990 temperature levels rather than pre-industrial levels. Because pre-industrial warming until 1990 was 0.6°C, an impact resulting from a temperature rise of 1°C equates to a 1.6°C rise from pre-industrial levels. *Id.*

⁷⁹ See Smith, *supra* note 77, at 4133, 4137.

⁸⁰ See *id.* An updated burning embers diagram was omitted from the 2007 Fourth Assessment Report due to opposition from the United States, China, Russia, and Saudi Arabia. Because the Assessment Report is a consensus document, these countries were able to prevent the inclusion of an updated diagram despite the insistence by New Zealand, small islands states, Canada, Germany, and the United Kingdom that inclusion of an updated burning embers diagram was essential. See also Andrew C. Revkin, *Why 2007 I.P.C.C. Report Lacked 'Embers'*, N.Y. TIMES, Feb. 26, 2009, available at <http://dotearth.blogs.nytimes.com/2009/02/26/why-2007-ipcc-report-lacked-embers>.

⁸¹ See *id.*

⁸² Smith, *supra* note 77, at 3.

⁸³ Rachel Warren, *Impacts of Global Climate Change at Different Annual Mean Global Temperature Increases*, in AVOIDING DANGEROUS CLIMATE CHANGE 95 (2006). Unlike the IPCC's Reason For Concern, Warren assessed impacts from temperature rise from pre-industrial levels, not 1990 levels.

⁸⁴ Smith, *supra* note 77, at 3.

⁸⁵ See Warren, *supra* note 83, at 98.

severely affect northern peoples and cause the extinction of the polar bear and many other species. Moreover, because Arctic ice functions to reflect heat back into the atmosphere, its loss would allow more sunlight to heat the Arctic Ocean, creating a negative feedback loop that would further accelerate the melting of the Greenland ice sheet. As the devastating and irreversible impacts resulting from a 2°C mean global temperature rise are clearly dangerous to public health and welfare, the commonly referenced 450 ppm CO₂ stabilization and 2°C targets are not adequate.

In light of the scope and irreversibility of the consequences of overshooting a 2°C threshold, the risk tolerance for such an outcome should be extremely low. The risk of overshooting a 2°C threshold is 50–82 percent at stabilization levels of 450–550 ppm CO₂eq.⁸⁶ On the other hand, stabilizing greenhouse gas concentrations at 350 ppm CO₂eq would reduce the mean probability of overshooting a 2°C temperature rise to 7 percent.⁸⁷

Ultimately, it may well be necessary to reduce atmospheric CO₂ to below 350 ppm. In September 2008, the director of the Potsdam Institute for Climate Impact Research in Germany, John Schellnhuber, told the *Guardian* that proposed GHG reduction targets were insufficient, and that a reduction of CO₂ to the pre-industrial level of 280 ppm would be required to ensure a stable climate.⁸⁸ Schellnhuber stated, “It is a very sweeping argument, but nobody can say for sure that 330ppm is safe. Perhaps it will not matter whether we have 270ppm or 320ppm, but operating well outside the [historic] realm of carbon dioxide concentrations is risky as long as we have not fully understood the relevant feedback mechanisms.”⁸⁹

Protection of the Arctic and other particularly vulnerable regions such as coastal areas and low lying islands may also require a lower level. Hansen et al. (2008) concluded:

Stabilization of Arctic sea ice cover requires, to first approximation, restoration of planetary energy balance. Climate models driven by known forcings yield a present planetary energy imbalance of +0.5-1 W/m². Observed heat increase in the upper 700 m of the ocean confirms the planetary energy imbalance, but observations of the entire ocean are needed for quantification. CO₂ amount must be reduced to 325-355 ppm to increase outgoing flux 0.5-1 W/m², if other forcings are unchanged. A further imbalance reduction, and thus CO₂ ~300-325 ppm, may be needed to restore sea ice to its area of 25 years ago.⁹⁰

Because current evidence indicates that limiting atmospheric CO₂ to no more than 350 ppm is necessary to protect public health and welfare, Petitioners request both a primary and

⁸⁶ Malte Meinshausen, *What Does a 2°C Target Mean for Greenhouse Gas Concentrations? A Brief Analysis Based on Multi-Gas Emission Pathways and Several Climate Sensitivity Uncertainty Estimates*, in AVOIDING DANGEROUS CLIMATE CHANGE 268, 270 (2006).

⁸⁷ *Id.*

⁸⁸ David Adam, *Roll Back Time to Safeguard Climate, Expert Warns: A Return to Pre-Industrial Levels of Carbon Dioxide Urged as the Only Way to Prevent the Worst Impacts of Global Warming*, THE GUARDIAN, Sept. 15 2008, available at <http://www.guardian.co.uk/environment/2008/sep/15/climatechange.carbonemissions>.

⁸⁹ *Id.*

⁹⁰ *Id.* at 226 (internal citations omitted).

secondary national pollution limit (NAAQS) of no more than 350 ppm CO₂. The EPA may be required to adjust the pollution limit downward as further information becomes available.

C. Pollution Limits for the Other Petitioned Pollutants

Petitioners request that EPA issue national pollution limits for each additional greenhouse gas as specified in Table 2: Petitioned National Pollution Limits. Petitioners recognize that in the proposed endangerment finding, EPA proposes to regulate the six greenhouse gases together, and that the EPA has flexibility with regard to regulating the petitioned greenhouse gases either individually or as a group.⁹¹ Petitioners also recognize the importance of the CO₂-eq metric⁹² in many circumstances, and the potential administrative efficiency benefits that can be achieved through the regulation of greenhouse gases as a group as opposed to individually. EPA could also utilize a combination of approaches, so long as the chosen approach facilitates achievement of the Clean Air Act's objectives and is neither arbitrary nor capricious. The Clean Air Act's flexibility in this regard allows differentiated prioritization and achievement of various policy objectives.

However, setting national pollution caps for each of the greenhouse gases individually allows for greater precision in achieving a number of policy objectives. For example, methane is particularly effective at warming the Arctic in part because, in addition to being a potent greenhouse gas in its own right, it is also an ozone precursor. Tropospheric ozone, unlike other greenhouse gases, absorbs both infrared radiation and shortwave radiation (visible light). Thus, tropospheric ozone is a powerful warming agent over highly reflective surfaces like the Arctic in the springtime, because it traps shortwave radiation from the sun both as it enters the Earth's atmosphere and when it is reflected back out again by snow and ice. Reducing global methane emissions will reduce ozone concentrations in the Arctic, providing a double benefit to the region.⁹³ Deep and rapid reductions in methane are needed in order to save the seasonal Arctic ice pack and Arctic species.⁹⁴ Stated another way, a given volume of methane reductions with

⁹¹ "Air pollutant" is defined by the Clean Air Act as follows:

The term "air pollutant" means any air pollution agent or *combination of such agents*, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term "air pollutant" is used. Clean Air Act § 302(g), 42 U.S.C. 7602(g) (2008) (emphasis added).

⁹² Greenhouse gases differ in their warming influence on the global climate system due to both their different radioactive properties and different lifetimes in the atmosphere. Therefore, a common method is needed to compare the gases. The most widely used method for doing so is CO₂-eq, which expresses a common warming influence based on the radiative forcing of CO₂. The term "CO₂-eq emissions" refers to the amount of CO₂ that would cause the same time-integrated radiative forcing, over a given time horizon, as an emitted amount of a long lived greenhouse gas or a mixture of greenhouse gases. The CO₂-eq emission is obtained by multiplying the emission of a greenhouse gas by its Global Warming Potential (GWP) for the given time horizon. L. BERNSTEIN ET AL., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 36 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

⁹³ See, e.g., J. Hansen et al., *Climate Change and Trace Gases*, 365 PHIL. TRANS. R. SOC. A. 1925 (2007), available at http://pubs.giss.nasa.gov/docs/2007/2007_Hansen_etal_2.pdf; Shindell, D., *Local and Remote Contributions to Arctic Warming*, GEOPHYS. RES. LETT. 34, L14704 (July 20, 2007), available at <http://www.agu.org/pubs/crossref/2007/2007GL030221.shtml>.

⁹⁴ *Id.*

the same CO₂-eq measure as a given volume of CO₂ emissions reductions would have a greater impact on Arctic warming in the short term.

The EPA must carefully consider such issues in order to ensure that the public health and welfare is protected with an adequate margin of safety.⁹⁵ As the climate crisis rapidly worsens, it is essential to regulate at least some of the pollutants individually to protect particularly vulnerable regions such as the Arctic or prevent or ameliorate certain other impacts. And while the Clean Air Act grants discretion to EPA as to whether to regulate individual pollutants or groups of pollutants, ultimately EPA must ensure that its choice allows it to achieve the substantive goals of the Clean Air Act, including Section 109's mandate to protect the public health with an adequate margin of safety.

For these reasons, Petitioners request individual national pollution limits for each pollutant at the levels specified in Table 2.

⁹⁵ Similar issues were discussed by one commentator as follows:

Comparing [greenhouse gases] is not a straightforward issue for several reasons. Perhaps the most fundamental reason is the gases' various lifetimes in the atmosphere. While the radiative forcing of methane emissions lasts for a decade or two, the radiative forcing of carbon dioxide lasts for centuries. Additional difficulties are raised due to the complexities in the relationship between radiative forcing and a more relevant metric of climate change: temperature change. Moreover, as pointed out by the IPCC (2001b, Ch. 19), there is evidence that the impact from emissions of various GHGs in some cases (such as impact on ecosystems) depends more on the rate of change of temperature rather than changes in level. In other cases (such as sea-level rise), impacts may depend more on the integrated change of surface temperature. Taking into account possible threshold values of climate change is also important. The functional form of damages will hence affect the efficient trade-off between various GHGs. Furthermore, because of the nonlinearities of the climate system, the evaluation of the present emissions of some GHGs will depend on which future background scenario is used (see, e.g., Smith and Wigley, 2000). Because of all these issues, designing an index to compare today's emissions of various GHGs is a challenging task. Odd Godal, *The IPCC's Assessment of Multidisciplinary Issues: The Case of Greenhouse Gas Indices*, 58 CLIMATIC CHANGE 243 (Nov. 2003).

Table 2: Petitioned National Pollution Limits

Pollutant^a	Lifetime (years)	Pre-Industrial Concentration	Current Concentration^b	Primary Pollution Limit	Secondary Pollution Limit
Carbon Dioxide (CO₂)	<i>See note c below</i>	275-285 ppm ^d	385.2 ^e ppm (2008)	350 ppm	350 ppm
Methane (CH₄)	12	715 ppb ^f	1797 ^e ppb (2008)	715 ppb	715 ppb
Nitrous Oxide (N₂O)	114	270 ppb	321.8 ^e ppb (2008)	270 ppb	270 ppb
Hydrofluorocarbons (HFCs)^h	1.4-270				
HFC-125	29	0	3.7 ppt ^g	1 ppt	1 ppt
HFC-134a	14	0	35 ppt	1 ppt	1 ppt
HFC-152a	1.4	0	3.9 ppt	1 ppt	1 ppt
HFC-23	270	0	18 ppt	1 ppt	1 ppt
Perfluorocarbons (PFCs)^h					
PFC-14	50,000	0	74 ppt	75 ppt	75 ppt
PFC-116	10,000	0	2.9 ppt	3 ppt	3 ppt
Sulfur hexafluoride (SF₆)	3,200	0	5.6 ppt	5.7 ppt	5.7 ppt
Nitrogen Trifluoride (NF₃)	740	0	0.454 ⁱ ppt (2008)	0.46 ppt	0.46 ppt

^a Unless otherwise noted, data from P. Forster et al., *Changes in Atmospheric Constituents and in Radiative Forcing*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Solomon, S., et al. eds., Cambridge University Press 2007).

^b 2005 value unless otherwise noted.

^c It is not possible to give a single lifetime for CO₂, but research has highlighted its long residence time. While approximately half of the carbon emitted is removed by the natural carbon cycle within a century, a substantial fraction of anthropogenic CO₂ will persist in the atmosphere for several millennia. *See, e.g.,* A. Montenegro et al., Long term fate of atmospheric carbon, *Geophys. Res. Lett.*, 34, L19707, doi:10.1029/2007GL030905 (2007) (25% of emitted CO₂ will have an atmospheric lifetime of more than 5000 years); S. Solomon et al., Irreversible climate change due to carbon dioxide emissions, *PNAS* 106: 1704-1709 (2009).

^d parts per million.

^e World Meteorological Organization (WMO). 2009. WMO Greenhouse Gas Bulletin. No. 5: 23 November 2009. Available at <http://www.wmo.int/pages/prog/arep/gaw/ghg/GHGbulletin.html>.

^f parts per billion.

^g parts per trillion.

^h Petitioners seek regulation of all HFCs and PFCs for which either significant concentrations or large trends in concentrations have been observed or a clear potential for future emissions has been identified. The compounds with the greatest contribution to global warming are included here for illustrative purposes.

ⁱ Weiss et al. 2008, *supra* note 62.

As with CO₂, because current evidence indicates these levels are necessary to protect both the public health and welfare from global warming and climate disruption, Petitioners seek these levels as both the primary and secondary national pollution limits.

Methane and nitrous oxide are the two most important greenhouse gases after carbon dioxide, and the deep and rapid reduction of both of these pollutants is an essential part of any action plan to stabilize the climate system. Petitioners thus request that EPA set the national pollution limits for these gases at the natural level that existed prior to significant human-caused emissions, 715 ppb for methane and 270 ppb for nitrous oxide. Because methane has a relatively short atmospheric lifetime of 12 years, this level, though ambitious, will be achievable if combined with other greenhouse reduction measures sufficient to slow and reverse climate feedbacks, such as the release of methane from melting Arctic permafrost, which if left unchecked may overwhelm other reduction efforts. While nitrous oxide remains in the atmosphere for 114 years, an ambitious reduction target is warranted due to its high global warming impact and importance to overall greenhouse reduction efforts.

Significant reductions in the HFCs, which have relatively short atmospheric lifetimes, are also needed. Thus the petitioned pollutant limit of 1 ppt for each of the HFCs, which are entirely man-made and do not occur naturally in the environment, would require release of these chemicals to be virtually eliminated, resulting in an eventual return to near zero concentration of these greenhouse gases in the atmosphere.

The extremely long atmospheric lifetimes of the PFCs, sulfur hexafluoride, and nitrogen trifluoride means that their atmospheric concentrations will remain elevated for many hundreds to thousands of years even if all emissions end immediately. Thus the petitioned pollution limits are set at close to current levels, which would require the phase out of these pollutants in the short term, but at least for the next centuries would only result in stabilization of current concentrations of these pollutants, until and unless a method for removing these chemicals from the atmosphere is developed.

III. EPA Must Expediently Facilitate the State Implementation Planning Process

After EPA adopts national pollution limits, each “[s]tate shall, after reasonable notice and public hearings, adopt and submit to the Administrator . . . a plan which provides for implementation, maintenance, and enforcement of [these limits].”⁹⁶ Through this “cooperative federalism” structure, the Clean Air Act delegates the primary responsibility for choosing the steps necessary to achieve and maintain the national pollution limits to the states. The state implementation planning process effectively combines the benefits of both state and federal involvement in greenhouse gas reductions. The successful state implementation planning process should be mobilized immediately to address the climate crisis.

A. Overview of the State Implementation Planning Process

A state implementation plan is a comprehensive strategy devised by each state to achieve or maintain the national pollution limits. Generally, a state begins the state implementation

⁹⁶ Clean Air Act § 110(a)(1), 42 U.S.C. § 7410 (a)(1) (2008).

planning process by creating an inventory of all emissions sources in the state.⁹⁷ It then determines the amount of emissions reductions that will be necessary to attain or, if it is already in attainment, maintain the ambient levels required by the national pollution limits through air quality modeling.⁹⁸ After determining the amount of reductions necessary, the state outlines a suite of measures designed to achieve those reductions, including emissions limitations, monitoring requirements, enforcement mechanisms, and schedules for compliance.⁹⁹ The state formally adopts these measures into the state implementation plan after public comment.¹⁰⁰

The states must submit their completed state implementation plans to EPA for approval.¹⁰¹ EPA must approve state implementation plans if they show that the state will attain or maintain the national pollution limits,¹⁰² although EPA may also partially or conditionally approve a state implementation plan and require revisions.¹⁰³ If a state fails to submit a state implementation plan that demonstrates attainment or maintenance of the national pollution limits, EPA must apply a variety of funding and compliance sanctions.¹⁰⁴

If a state has failed to submit an approvable state implementation plan two years after the deadline, EPA must issue a federal implementation plan.¹⁰⁵ A federal implementation plan is “a plan (or portion thereof) promulgated by the Administrator to fill all or a portion of a gap or otherwise correct all or a portion of an inadequacy in a State implementation plan . . . and provides for attainment of the relevant national [pollution limit].”¹⁰⁶ Therefore, if the states fail to do their job under section 110, EPA must create, and the states must implement, a federal plan in order to attain or maintain the national pollution limit.

B. State Implementation Plans are Well Suited to Reducing Greenhouse Gas Emissions

Once EPA sets national pollution limits for greenhouse gases, the states must update their state implementation plans to achieve or maintain those limits as they do for the other criteria air pollutants. Although greenhouse gases present a different set of concerns than the existing criteria pollutants, the state implementation plan process is fully able to address these unique concerns and is well suited to effectively reducing greenhouse gas emissions.¹⁰⁷

⁹⁷ See Clean Air Act § 172, 42 U.S.C. § 7502(c)(3) (2008) (for nonattainment areas); 40 C.F.R. § 51.114 (for attainment areas).

⁹⁸ Clean Air Act § 110(a), 42 U.S.C. § 7410(a) (2008); Doremus et al., *supra* note 6.

⁹⁹ Clean Air Act § 110(a)(2), 42 U.S.C. § 7410(a)(2) (2008).

¹⁰⁰ *Id.* § 7410(a)(1).

¹⁰¹ *Id.*

¹⁰² *Id.* § 7410(k)(3).

¹⁰³ *Id.* § 7410(k)(4).

¹⁰⁴ Clean Air Act § 179, 42 U.S.C. § 7509 (2008).

¹⁰⁵ Clean Air Act § 110(c)(1), 42 U.S.C. § 7410(c)(1) (2008).

¹⁰⁶ Clean Air Act § 302(y), 42 U.S.C. § 7602(y) (2008).

¹⁰⁷ EPA’s proposed Tailoring Rule has already commenced the process of tailoring greenhouse gas permitting procedures required under the Clean Air Act’s Title V and prevention of significant deterioration program, and can create similar procedures to allow an efficient and streamlined process to amend and implement state implementation plans, beginning with the regulation of large emitters and including smaller emitters as soon as administratively possible. See 74 Fed. Reg. 55292.

Unlike the existing criteria air pollutants, greenhouse gases are globally dispersed, so that attainment of a national pollution limit for greenhouse gases is a global rather than merely a local concern. Therefore, instead of focusing solely on achieving local air quality standards, state implementation plans for greenhouse gases must focus on achieving each state's proportional share of greenhouse pollution reductions needed to attain the national pollution limit. EPA will need to allocate proportional emissions reduction targets to the states; they, in turn, will demonstrate through state implementation plans how they will integrate the federal minimum requirements by means of their own initiatives to achieve that proportional share of national emissions reductions.

Under the Clean Air Act, a state implementation plan must: 1) monitor, compile, and analyze data on ambient air quality; 2) include enforceable emission limitations and other control measures, means, or techniques (which may include economic incentives such as fees, marketable permits, and auctions of emission rights), as well as schedules and timetables for compliance; and 3) include a program to provide for enforcement of emission reduction measures.¹⁰⁸

Many states are already implementing or are well on their way to completing greenhouse gas reduction plans, and their success to date illustrates the feasibility of developing state implementation plans for greenhouse gases. Many of the required state implementation plan elements are already included in these climate change action plans. As of August 2009, at least forty-seven states have completed or are completing a GHG inventory, thirty-eight are drafting or have drafted climate action plans, and twenty-three states have adopted emissions reduction targets.¹⁰⁹ These existing state climate change plans will undoubtedly form the basis of future greenhouse gas state implementation plans.

In its Advance Notice of Proposed Rulemaking on greenhouse gases, EPA questioned whether it might be unable to approve state implementation plans for greenhouse gases because it is not possible for any individual state (or country) to attain an atmospheric greenhouse gas limit solely through its own efforts.¹¹⁰ In the proposed Endangerment Finding, however, EPA fully recognized that such a concern is misplaced; because of the global nature of greenhouse emissions, their treatment under the Clean Air Act requires a differentiated approach:

Greenhouse gas emissions from section 202(a) source categories, or from any other U.S. source, will become globally mixed in the atmosphere, and thus will have an effect not only on the U.S. regional climate but on the global climate as a whole, and indeed for years and decades to come. The Administrator believes that these unique, global aspects of the climate change problem tend to support a finding that lower levels of emissions should be considered to contribute to the air pollution than might otherwise be considered appropriate when considering contribution to a local or regional air pollution problem. [¶] . . . *If the U.S. and the rest of the world are to combat the risks associated with global climate change, contributors must do their part even if their contributions to the global*

¹⁰⁸ Clean Air Act § 110(2), 42 U.S.C. § 7410(2) (2008).

¹⁰⁹ U.S. Env'tl. Prot. Agency, *supra* note 3; Pew Ctr. on Global Climate Change, *supra* note 3.

¹¹⁰ 73 Fed. Reg. at 44481.

*problem, measured in terms of percentage, are smaller than typically encountered when tackling solely regional or local environmental issues.*¹¹¹

In other words, EPA now fully acknowledges that the U.S. must reduce its greenhouse gas emissions from all sources even though reduction in any individual state or in the U.S. alone will not achieve the full remediation of their deleterious impacts on public health and welfare.

Moreover, Section 179B of the Clean Air Act specifically contemplates and provides an answer to the problem of international emissions.¹¹² Section 179B states that a state implementation plan

shall be approved by the Administrator [if the state] establishes to the satisfaction of the Administrator that the implementation plan of such State would be adequate to attain and maintain the relevant national ambient air quality standards by the attainment date . . . *but for* emissions emanating from outside of the United States.¹¹³

Because greenhouse gases are globally mixed, precisely this calculation must be performed by all nations in whatever attempt is made to reduce their own emissions so that a sustainable global greenhouse gas concentration level can be reached – whether through the Clean Air Act, a carbon tax, a cap-and-trade scheme, or some combination or other alternative. There is, therefore, no obstacle to the successful implementation of the statutory scheme. As long as each greenhouse gas state implementation plan accomplishes the state's proportional share of the greenhouse gas reductions necessary to achieve the national pollution cap, and otherwise complies with the requirements of section 110, EPA must approve the state implementation plan. If the plan does not meet these requirements, then EPA must design a federal implementation plan in order to do so. A state's proportionate share would be based on the emissions reductions necessary for the nation as a whole to contribute to global greenhouse gas reductions to below the established pollution limit. The allocation of a proportionate share to a state can be based on any reasonable allocation, such as on the types and numbers of emission sources within its boundaries, population numbers or some other reasonable metric or combination of metrics.

C. The Substantial Benefits of State Implementation Planning for Greenhouse Gases

The development of state implementation plans will have numerous regulatory and practical benefits, including allowing states to build upon existing programs, taking advantage of existing expertise and familiarity with the current regulatory structure, encouraging innovation, and providing consistency and coordination among state programs. Without federal involvement in the ongoing state efforts, their success rate and economic return will necessarily be diminished by the lack of a common pollution limit, lack of nationwide participation, overlapping and/or contradictory requirements, lack of collective learning and potential unnecessary duplication of effort. It is essential that EPA facilitate the state implementation planning process as

¹¹¹ 74 Fed. Reg. at 18907 (emphasis added).

¹¹² Clean Air Act § 179, 42 U.S.C. § 7509a (2008); Christopher T. Giovino, *Defending Overstatement: The Symbolic Clean Air Act*, 30 HAR. ENV. L. REV. 99, 154-55 (2006).

¹¹³ 42 U.S.C. § 7509a(a)(2) (2008) (emphasis added).

expeditiously as possible in order to realize these substantial benefits, a few of which are enumerated below.

First, many strategies that can best reduce greenhouse gas emissions will require policy actions in areas that have traditionally been regulated by states and municipalities, such as land use policies, building codes for residential, commercial and industrial facilities, transportation, utility regulation and agriculture regulation, forestry, and non-hazardous waste handling.¹¹⁴ By influencing building codes, development patterns, efficiency requirements and land use policies, states are able to control the emissions from these types of projects. The state implementation plan process incorporates these critically important, but traditionally state-controlled areas of regulation into a unified greenhouse gas reduction structure for the nation. Studies performed to date indicate that such local measures can have a significant impact on GHG emissions in the United States.¹¹⁵ Because greenhouse gases are emitted by numerous stationary and mobile sources, there is no silver bullet solution to the climate crisis; rather, EPA must implement reductions in a variety of contexts in a complementary fashion. The Clean Air Act is designed to do just that, and the importance of mobilizing all the states in their traditional areas of jurisdiction cannot be overemphasized.

Second, because state implementation plans can effectively address areas traditionally under state and local control, the state implementation plan process would fill the gaps in proposed federal emission trading strategies. While cap-and-trade strategies may address some aspects of the greenhouse gas problem, achieving emission reductions on a large enough scale and rapidly enough to prevent the most extreme manifestations of climate change will require substantial changes in behavior among many actors in all sectors of the economy that cap-and-trade strategies are unlikely to fully or effectively address.¹¹⁶ Rather than rely solely on an untested emissions market, state and local planning strategies must also target areas, such as land use and building codes, for which trading schemes are not well suited.

Third, the significant strides states have already made in reducing their emissions are presently not integrated with federal action. Federal review of state climate reduction efforts

¹¹⁴ Doremus, *supra* note 6, at 827-28; Alice Kaswan, *A Cooperative Federalism Proposal for Climate Change Legislation: The Value of State Autonomy in a Federal System*, 95 DENV. U. L. REV. 791, 829 (2008). For example, one study found that residential and commercial buildings—structures that fit squarely within a state’s jurisdiction—account for one-third of U.S. carbon emissions. MARILYN A. BROWN ET AL., BROOKINGS INST. METROPOLITAN POLICY PROGRAM, *Shrinking the Carbon Footprint of Metropolitan America* (May 2008), available at http://www.brookings.edu/reports/2008/05_carbon_footprint_sarzynski.aspx. Another study concluded that compact development patterns can reduce vehicle miles traveled, and the associated carbon emissions, by as much as 20 – 40%. REID EWING ET AL., *GROWING COOLER: THE EVIDENCE ON URBAN DEVELOPMENT AND CLIMATE CHANGE* 10-11 (2007), available at <http://www.smartgrowthamerica.org/documents/growingcoolerCH1.pdf>.

¹¹⁵ As of 2007, almost half (23) of the states had joined one of three regional emission reduction programs that together account for about 39% of U.S. CO₂ emissions and pursue reduction targets. JONATHAN L. RAMSEUR, CONGRESSIONAL RESEARCH SERVICE, *CLIMATE CHANGE: ACTION BY STATES TO ADDRESS GREENHOUSE GAS EMISSIONS* 25 (2007), available at <http://www.ncseonline.org/NLE/CRSreports/07Dec/RL33812.pdf>. For example, a study has shown that compact residential and commercial development patterns can, by themselves, reduce total transportation-related CO₂ emissions by 7 to 10 percent in 2050. EWING ET AL., *supra* note 114, at 9. Residential and commercial buildings account for 21 and 18 percent, respectively, of CO₂ emissions that can be reduced by local building codes. *Id.*

¹¹⁶ Doremus, *supra* note 6, at 800.

though the state implementation plan process will ensure uniformity among states, address interstate leakage concerns by requiring all states to take action, and vertically integrate rapidly expanding state and local climate change programs, as well as international programs, into a comprehensive national program.¹¹⁷

Fourth, the autonomy given to the states and significant latitude to experiment with control methods and technologies through the state implementation plan process also encourages innovation.¹¹⁸ As Justice Brandeis noted in 1932, states have greater flexibility that allows them to innovate with less severe consequences and use their ability to experiment to provide models for future federal legislation.¹¹⁹ In addition to allowing states to experiment, the state implementation plan framework allows states to learn from each other's successes and failures, and provides opportunity for greater collaboration among states.¹²⁰

Fifth, mandatory state planning also allows policy choices to respond to local variation in challenges and opportunities in a cost-effective manner. Each state has important differences in climate, resources, industry mix, transportation and legal structures for local government, public finance and utility regulation. Because of these differences among states, individualized consideration of the mix of greenhouse gas emission reduction measures, strategies and market and non-market approaches appropriate for each state will produce a more cost-effective approach than a single federal plan.¹²¹

Sixth, state emission reduction plans for greenhouse gases are extremely cost-effective and can result in significant economic benefits, even beyond those obtained through regulation of traditional air pollutants. Not only do greenhouse gas reduction measures result in economic benefits through avoidance of climate change damages, but the many measures targeting energy efficiency and reduced reliance on fossil fuels result in substantial savings over time.¹²² Recent state climate action plans demonstrate net economic savings from combined effects of specific, tried and tested action at the state level when combined with long-term transitions toward new technologies, systems and practices.¹²³ In a preliminary analysis based on data from 20 states with completed climate action plans, the Center for Climate Strategies estimated that "the U.S. could reduce GHG emissions to 10% below 1990 levels by 2020 at an estimated net economic savings of \$20.8 billion in 2012 and \$85 billion in 2020, from 2009 to 2020 cumulative savings of \$535.5 billion, through implementing a climate plan involving all U.S. states and economic

¹¹⁷ See Thomas D. Peterson et al., *Developing a Comprehensive Approach to Climate Change Policy in the United States that Fully Integrates Levels of Government and Economic Sectors*, 26 VIR. ENV. L. J. 227, 229, 264 (2008).

¹¹⁸ Kaswan, *supra* note 114, at 800.

¹¹⁹ *New State Ice Co. v. Liebmann*, 285 U.S. 262 (1932) (Brandeis, J., dissenting).

¹²⁰ Doremus, *supra* note 6, at 829.

¹²¹ Robert McKinstry et al., *The New Climate World: Achieving Economic Efficiency in a Federal System for GHG Regulation Through State Planning Combined with Federal Programs*, 34 N.C.J. INT'L L. & COM. REG. 767, 777 (2009).

¹²² See, e.g., CALIFORNIA AIR RESOURCES BOARD, CLIMATE CHANGE SCOPING PLAN 73 (Dec. 2008), available at <http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf>.

¹²³ Peterson et al., *supra* note 117, at 250-51.; see also CALIFORNIA AIR RESOURCES BOARD, *supra* note 122, at 73-97 (economic evaluation of greenhouse gas scoping plan).

sectors.”¹²⁴ The savings estimate did not include the potential for additional co-benefits such as energy independence and health and environmental protection.¹²⁵

Finally, additional benefits of the Clean Air Act and the state implementation plan process include the minimization of pollution havens and establishing greater incentives for pollution control research and development than individual state or local rules could provide.¹²⁶ The Act has long promoted health and environmental research, as well as technology transfer and other information management and dissemination services, and has resulted in the provision of substantial financial resources to state and local government programs and many other services.¹²⁷ The Clean Air Act has been responsible for controlling some of our most seemingly intractable air pollution problems, including the regional fine particle pollution which is responsible for much of the estimated monetary benefit of historical air pollution control;¹²⁸ these same successful strategies must be put to work reducing greenhouse gas pollution.

The national pollution limit and state implementation planning program is one of the primary mechanisms by which the Clean Air Act combines the best of both state and federal involvement to create a coherent and comprehensive program for the most effective regulation of greenhouse gases. The cooperative federalism structure already embodied in this modern law is ideally suited to achieving the required greenhouse gas reductions from all sectors of the economy.

TIMELINE FOR PETITIONED ACTIONS

The Clean Air Act includes mandatory deadlines for the petitioned actions (e.g., issuance of national pollution caps) and actions which consequently become required (e.g., preparation and submission of state implementation plans). Based on the urgency of the climate crisis, Petitioners believe the EPA and the states can and must act far faster than the maximum time allowed by statute. Table 3 sets forth both the statutory deadlines and the petitioned timeline for some of the key petitioned and consequent actions.

¹²⁴ CENTER FOR CLIMATE STRATEGIES, CLIMATE CHANGE POLICY AS ECONOMIC STIMULUS: EVIDENCE AND OPPORTUNITIES FROM THE STATES 4 (2008), *available at* <http://www.climatestrategies.us/ewebeditpro/items/O25F20494.pdf>.

¹²⁵ *Id.*

¹²⁶ U.S. ENVTL. PROT. AGENCY, *supra* note 9, at 3.

¹²⁷ *Id.*

¹²⁸ *Id.*

Table 3: Timeline for Petitioned and Consequent Actions

Petitioned or Consequent Action	Maximum Time Allowed by Statute	Action Requested Within (Time from Present)
Designate the greenhouse gases as criteria air pollutants	EPA must respond to the petition within a reasonable time	6 months
Issue air quality criteria and information on air pollution control techniques for the greenhouse gases pursuant to section 108(a)(2) and (b)(1)	12 months from criteria air pollutant designation	9 months
Publish proposed national primary and secondary pollution caps for the greenhouse gases pursuant to section 109(a)	12 months from criteria air pollutant designation	9 months
Publish final national primary and secondary pollution caps for the greenhouse gases	No later than 90 days after initial publication of proposed caps	1 year
States submit state implementation plan revisions incorporating measures for greenhouse gases to EPA pursuant to section 110(a)	3 years (or “such shorter period as the Administrator may prescribe”) from promulgation of final pollution caps	2 years
EPA find the plans complete or requires revision	Within 60 days of receipt of plan	2 years, 2 months
Full or partial approval of state plans, begin full implementation	Within 12 months of finding a plan complete	2 ½ years

Petitioners recognize that the petitioned timeline is faster in many regards than past compliance for current criteria air pollutants. Petitioners further recognize that some may argue that establishment of a national pollution limit for greenhouse gases and full deployment of the state implementation planning process will take too long, based in part on lengthy delays in past implementation. Petitioners, however, reject any cynical assertion that the EPA and states cannot be expected to meet the timelines set forth in the law. Moreover, to the degree that some may argue that further delays in implementation are inevitable due to industry lawsuits, or that the system would be too complicated or unworkable, those arguments could all be made with greater strength with regard to the currently proposed cap-and-trade program in federal climate legislation. It is, in fact, more likely that an entirely new greenhouse regulatory scheme will be subject to delay due to lawsuits from industry, as opposed to implementation of the Clean Air Act, under which the EPA, states, and industry have four decades of experience.

CONCLUSION

The EPA's delay to date in implementing greenhouse gas regulation pursuant to the Clean Air Act not only jeopardizes public health and welfare, but has taken us almost to a point of no return that may change our planet's future in profound and tragic ways. For all the reasons discussed above, we urge the EPA to quickly implement the steps described in this petition.

As leading climate scientists note, "[r]ealization that we must reduce the current CO₂ amount has a bright side: effects that had begun to seem inevitable, including impacts of ocean acidification, loss of fresh water supplies, and shifting of climatic zones, may be averted by the necessity of finding an energy course beyond fossil fuels sooner than would otherwise have occurred."¹²⁹

These authors conclude

[w]ith simultaneous policies to reduce non-CO₂ greenhouse gases, it appears still feasible to avert catastrophic climate change. Present policies, with continued construction of coal fired power plants without CO₂ capture, suggest that decision-makers do not appreciate the gravity of the situation. We must begin to move now toward the era beyond fossil fuels. Continued growth of greenhouse gas emissions, for just another decade, practically eliminates the possibility of near-term return of atmospheric composition beneath the tipping level for catastrophic effects. The most difficult task, phase-out over the next 20-25 years of coal use that does not capture CO₂, is Herculean, yet feasible when compared with the efforts that went into World War II. The stakes, for all life on the planet, surpass those of any previous crisis. The greatest danger is continued ignorance and denial, which could make tragic consequences unavoidable.¹³⁰

We urge the EPA to rapidly and fully utilize the tools provided by the Clean Air Act—tools that for many years have proven both successful and cost-effective—to address the climate crisis as detailed in this petition.

Respectfully Submitted this 2nd day of December, 2009.



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¹²⁹ Hansen, *supra* note 70, at 228.

¹³⁰ *Id.* at 229.

LITERATURE CITED

Dean Abrahamson, An Open Letter to the President and Members of Congress Strong Leadership Needed Now on Climate (June 23, 2009).

David Adam, Roll Back Time to Safeguard Climate, Expert Warns: A Return to Pre-Industrial Levels of Carbon Dioxide Urged as the Only Way to Prevent the Worst Impacts of Global Warming, *The Guardian*, Sept. 15 2008.

I. Allison et al., *The Copenhagen Diagnosis, 2009: Updating the World on the Latest Climate Science* (2009).

L. Bernstein, et al., *IPCC, Climate Change 2007: Synthesis Report*. (2007).

Marilyn A. Brown, et al., *Brookings Institute, Shrinking the Carbon Footprint of Metropolitan America* (May 2008).

California Air Resources Board, *Climate Change Proposed Scoping Plan: A Framework for Change* (2008).

Center for Climate Strategies, *Climate Change Policy as Economic Stimulus: Evidence and Opportunities from the States* (2008).

Holly Doremus and W. Michael Hanemann, Of Babies and Bathwater, Why the Clean Air Act's Cooperative Federalism Framework Is Useful for Addressing Global Warming, 50 *Ariz. L. Rev.* 799 (2008).

P.R. Epstein et al., *Harvard Med. School Ctr. For Health and the Global Env't, Climate Change Futures Health, Ecological, and Economic Dimensions* (2005).

Reid Ewing et al., *Growing Cooler: the Evidence on Urban Development and Climate Change* (2007).

P. Forster et al., *Changes in Atmospheric Constituents and in Radiative Forcing*, in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Solomon, S., et al. eds., Cambridge University Press 2007).

Christopher T. Giovino, *Defending Overstatement: The Symbolic Clean Air Act*, 30 *Har. Env. L. Rev.* 99 (2006).

The Global Humanitarian Forum, *Human Impact Report Climate Change: the Anatomy of a Silent Crisis* (2009).

Odd Godal, *The IPCC's Assessment of Multidisciplinary Issues: The Case of Greenhouse Gas Indices*, *Climatic Change*, Nov. 2003.

J. Hansen et al., Target Atmospheric CO₂: Where Should Humanity Aim?, *The Open Atmospheric Science Journal*, 2008, 217, 218.

J. Hansen et al., Climate Change and Trace Gases, 365 *Phil. Trans. R. Soc. A*. 1925 (2007).

J.S. Holladay et al., New York University School of Law, *Economists and Climate Change Consensus and Open Questions* (2009).

Marlow Hood, Top UN Climate Scientist backs Ambitious CO₂ Cuts, *Agence France Press*, Aug. 28, 2009.

Intergovernmental Panel on Climate Change, *Climate Change 2001: Synthesis Report, Summary for Policymakers* (2001).

Alice Kaswan, A Cooperative Federalism Proposal for Climate Change Legislation: The Value of State Autonomy in a Federal System, 95 *Denv. U. L. Rev.* 791 (2008).

Robert B. McKinstry & Thomas D. Peterson, The Business of Climate Change: Challenges and Opportunities for Multinational Business Enterprises: The Implications of the New “Old” Federalism in Climate-Change Legislation: How to Function in a Global Marketplace When States Take the Lead, 20 *Pac. McGeorge Global Bus. & Dev. L.J.* 61 (2007).

Robert McKinstry et al., The New Climate World: Achieving Economic Efficiency in a Federal System for GHG Regulation Through State Planning Combined with Federal Programs, 34 *N.C.J. Int’l L. & Com. Reg.* 767 (2009).

Malte Meinshausen, What Does a 2°C Target Mean for Greenhouse Gas Concentrations? A Brief Analysis Based on Multi-Gas Emission Pathways and Several Climate Sensitivity Uncertainty Estimates, in *Avoiding Dangerous Climate Change* 268 (2006).

A. Montenegro et al., Long Term Fate of Atmospheric Carbon, 34 *Geophys. Res. Lett.* L19707 (2007).

Thomas D. Peterson et al., Developing a Comprehensive Approach to Climate Change Policy in the United States that Fully Integrates Levels of Government and Economic Sectors, 26 *Vir. Env. L.J.* 227 (2008).

Pew Ctr. On Global Climate Change, U.S. Climate Policy Maps, available at http://www.pewclimate.org/what_s_being_done/in_the_states/state_action_maps.cfm (last visited Nov. 25, 2009).

Jonathan L. Ramseur, Congressional Research Service, *Climate Change: Action by States to Address Greenhouse Gas Emissions* (2007).

Andrew C. Revkin, Why 2007 I.P.C.C. Report Lacked ‘Embers’, *N.Y. Times*, Feb. 26, 2009.

Shindell, D., Local and Remote Contributions to Arctic Warming, *Geophys. Res. Lett.* 34, L14704 (July 20, 2007).

Joel B. Smith et al., Assessing Dangerous Climate Change Through an Update of the Intergovernmental Panel on Climate Change (IPCC) "Reasons for Concern," 106 *Proc. Nat'l Acad. Sci.* 4133 (2009).

S. Solomon et al., Irreversible climate change due to carbon dioxide emissions, 106 *Proc. Nat'l Acad. Sci.* 1704 (2009)

R. Steizer et al., Center for Progressive Reform, A Return to Common Sense: Protecting Health, Safety, and the Environment through 'Pragmatic Regulatory Impact Analysis' (2009).

Sir Nicholas Stern, *Stern Review on the Economics of Climate Change* (Cambridge University Press 2006).

The Economics of Ecosystem Biodiversity, TEEB Climate Issues Update (Sept. 2009).

U.S. Env'tl. Prot. Agency, State and Local Governments, State Planning and Measurement, http://www.epa.gov/climatechange/wycd/stateandlocalgov/state_planning.html#three (last visited Dec. 1, 2009).

U.S. Env'tl. Prot. Agency, The Benefits and Costs of the Clean Air Act: 1970 to 1990 (1997).

U.S. Env'tl. Prot. Agency, The Benefits and Costs of the Clean Air Act: 1990 to 2010 (1999).

U.S. Env'tl. Prot. Agency, Press Release, The Benefits and Costs of the Clean Air Act, First Protective Study (Nov. 16, 1999).

U.S. Global Change Research Program, *Global Climate Change Impacts in the United States* (2009).

Rachel Warren, Impacts of Global Climate Change at Different Annual Mean Global Temperature Increases, in *Avoiding Dangerous Climate Change* (2006).

Henry Waxman with Joshua Green, *the Waxman Report How Congress Really Works* (Twelve/Grand Central Publishing 2009).

R. F. Weiss et al., Nitrogen Trifluoride in the Global Atmosphere, 35 *Geophys. Res. Lett.* L20821 (Oct. 2008).

Wooley, D.R. & E.M. Morss, *The Clean Air Act Handbook a Practical Guide to Compliance*, (Thompson West ed., 8th ed. 2008).

World Meteorological Organization (WMO), WMO Greenhouse Gas Bulletin, No. 5: 23 (November 2009).

Yale Environment 360, Amid Mounting Hope, a Voice of Hope for Copenhagen, Nov. 4, 2009.

APPENDIX A: PETITIONED POLLUTANTS

Table 4: Petitioned Pollutants (data from P. Forster et al., *Changes in Atmospheric Constituents and in Radiative Forcing*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Solomon, S., et al. eds., Cambridge University Press 2007).

Pollutant	Atmospheric Lifetime (years)	GWP1 20-yr	GWP 100- yr	GWP 500- yr
Carbon Dioxide (CO₂)	*	1	1	1
Methane (CH₄)	12	72	25	7.6
Nitrous Oxide (N₂O)	114	289	298	153
Hydrofluorocarbons (HFCs)	1.4-270			
HFC-23	270	12000	14,800	12,200
HFC-32	4.9	2,330	675	205
HFC-125	29	6350	3,500	1,100
HFC-134a	14	3830	1,430	435
HFC-143a	52	3,800	5,890	4,470
HFC-152a	1.4	437	124	38
HFC-227ea	34.2	5,310	3,220	1,040
HFC-236fa	240	8,100	9,810	7,660
HFC-245fa	7.6	3,380	1,030	314
HFC-365mfc	8.6	2,520	794	241
HFC-43-10mee	15.9	4,140	1,640	500
Perfluorocarbons (PFCs)				
PFC-14	50,000	5210	7,390	11,200
PFC-116	10,000	8630	12,200	18,200
PFC-218	2,600	6,130	8,830	12,500
PFC-318	3,200	7,310	10,300	14,700

PFC-3-1-10	2,600	6,330	8,860	12,500
PFC-4-1-12	4,100	6,510	9,160	13,300
PFC-5-1-14	3,200	6,600	9,300	13,300
PFC-9-1-18	>1000	>5,500	>7,500	>9,500
Trifluoromethyl Sulphur Petafluoride	800	13,200	17,700	21,200
Sulfur hexafluoride (SF₆)	3,200	16300	22,800	32,600
Nitrogen trifluoride	740	12300	17,200	20,700

EXHIBIT 5

USGCRP June 2009 Report (excerpts)

Global Climate Change Impacts in the United States

U.S. GLOBAL CHANGE
RESEARCH PROGRAM



The global warming of the past 50 years is due primarily to human-induced increases in heat-trapping gases. Human “fingerprints” also have been identified in many other aspects of the climate system, including changes in ocean heat content, precipitation, atmospheric moisture, and Arctic sea ice.

In 1996, the IPCC Second Assessment Report⁴⁴ cautiously concluded that “the balance of evidence suggests a discernible human influence on global climate.” Since then, a number of national and international assessments have come to much stronger conclusions about the reality of human effects on climate. Recent scientific assessments find that most of the warming of the Earth’s surface over the past 50 years has been caused by human activities.^{45,46}

This conclusion rests on multiple lines of evidence. Like the warming “signal” that has gradually emerged from the “noise” of natural climate variability, the scientific evidence for a human influence on global climate has accumulated over the past several decades, from many hundreds of studies. No single study is a “smoking gun.” Nor has any single study or combination of studies undermined the large body of evidence supporting the conclusion that human activity is the primary driver of recent warming.

The first line of evidence is our basic physical understanding of how greenhouse gases trap heat, how the climate system responds to increases in greenhouse gases, and how other human and natural factors influence climate. The second line of evidence is from indirect estimates of climate changes over the last 1,000 to 2,000 years. These records are obtained from living things and their remains (like tree rings and corals) and from physical quantities (like the ratio between lighter and heavier isotopes of oxygen in ice cores) which change in measurable ways as climate changes. The lesson from these data is that global surface temperatures over the last several decades are clearly unusual, in that they were higher than at any time during at least the past 400 years.⁴⁷ For the Northern Hemisphere, the recent temperature rise is clearly unusual in at least the last 1,000 years.^{47,48}

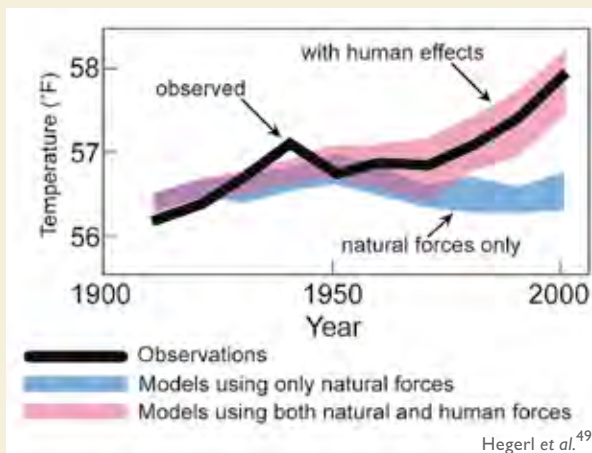
The third line of evidence is based on the broad, qualitative consistency between observed changes in climate and the computer model simulations of how climate would be expected to change in response to human activities. For example, when climate models are run with historical increases in greenhouse gases, they show gradual warming of the Earth and ocean surface, increases in ocean heat content and the temperature of the lower atmosphere, a rise in global sea level, retreat of sea ice and snow cover, cooling of the stratosphere, an increase in the amount of atmospheric water vapor, and changes in large-scale precipitation and pressure patterns. These and other aspects of modeled climate change are in agreement with observations.^{14,49}

Finally, there is extensive statistical evidence from so-called “fingerprint” studies. Each factor that affects climate produces a unique pattern of climate response, much as each person has a unique fingerprint. Fingerprint studies exploit these unique signatures, and allow detailed comparisons of modeled and observed climate change patterns.⁴⁴ Scientists rely on such studies to attribute observed changes in climate to a particular cause or set of causes. In the real world, the climate changes that have occurred since the start of the Industrial Revolution are due to a complex mixture of human and natural causes. The importance of each individual influence in this mixture changes over time. Of course, there are not multiple Earths, which would allow an experimenter to change one factor at a time on each Earth, thus helping to isolate different fingerprints. Therefore, climate models are used to study how individual factors affect climate. For example, a single factor (like greenhouse gases) or a set of factors can be varied, and the response of the modeled climate system to these individual or combined changes can thus be studied.⁵⁰

For example, when climate model simulations of the last century include all of the major influences on climate, both human-induced and natural, they can reproduce many important features of observed climate change patterns. When human influences are removed from the model experiments, results suggest that the surface of the Earth would actually have cooled slightly over the last 50 years. The clear message from fingerprint studies is that the



Separating Human and Natural Influences on Climate



The blue band shows how global average temperatures would have changed due to natural forces only, as simulated by climate models. The red band shows model projections of the effects of human and natural forces combined. The black line shows actual observed global average temperatures. As the blue band indicates, without human influences, temperature over the past century would actually have first warmed and then cooled slightly over recent decades.⁵⁸

observed warming over the last half-century cannot be explained by natural factors, and is instead caused primarily by human factors.^{14,50}

Another fingerprint of human effects on climate has been identified by looking at a slice through the layers of the atmosphere, and studying the pattern of temperature changes from the surface up through the stratosphere. In all climate models, increases in carbon dioxide cause warming at the surface and in the troposphere, but lead to cooling of the stratosphere. For straightforward physical reasons, models also calculate that the human-caused depletion of stratospheric ozone has had a strong cooling effect in the stratosphere. There is a good match between the model fingerprint in response to combined carbon dioxide and ozone changes and the observed pattern of tropospheric warming and stratospheric cooling (see figure on next page).¹⁴

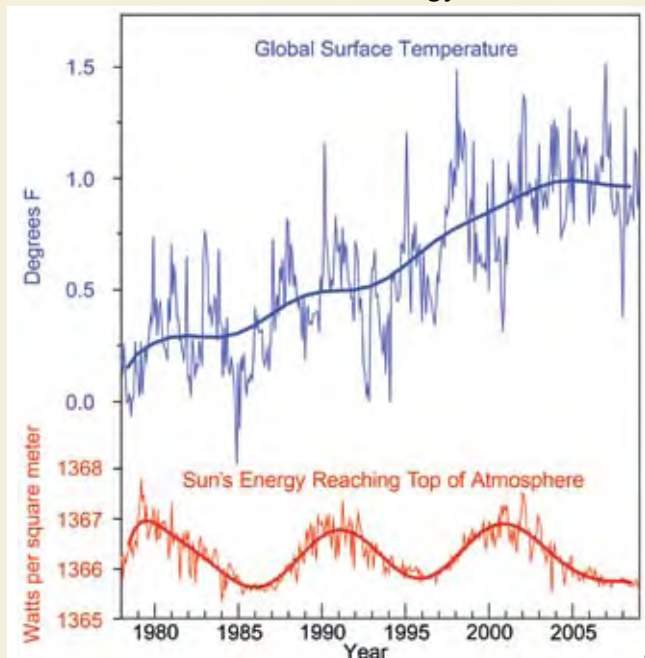
In contrast, if most of the observed temperature change had been due to an increase in solar output rather than an increase in greenhouse gases, Earth's atmosphere would have warmed throughout its full vertical extent, including the stratosphere.⁹ The observed pat-

tern of atmospheric temperature changes, with its pronounced cooling in the stratosphere, is therefore inconsistent with the hypothesis that changes in the Sun can explain the warming of recent decades. Moreover, direct satellite measurements of solar output show slight decreases during the recent period of warming.

The earliest fingerprint work⁵¹ focused on changes in surface and atmospheric temperature. Scientists then applied fingerprint methods to a whole range of climate variables,^{50,52} identifying human-caused climate signals in the heat content of the oceans,^{38,39} the height of the tropopause⁵³ (the boundary between the troposphere and stratosphere, which has shifted upward by hundreds of feet in recent decades), the geographical patterns of precipitation,⁵⁴ drought,⁵⁵ surface pressure,⁵⁶ and the runoff from major river basins.⁵⁷

Studies published after the appearance of the IPCC Fourth Assessment Report in 2007 have also found human fingerprints in the increased levels of atmospheric moisture^{35,36} (both close to the surface and over the full extent of the atmosphere), in the

Measurements of Surface Temperature and Sun's Energy



The Sun's energy received at the top of Earth's atmosphere has been measured by satellites since 1978. It has followed its natural 11-year cycle of small ups and downs, but with no net increase (bottom). Over the same period, global temperature has risen markedly (top).⁶⁰

decline of Arctic sea ice extent,⁶¹ and in the patterns of changes in Arctic and Antarctic surface temperatures.⁶²

The message from this entire body of work is that the climate system is telling a consistent story of increasingly dominant human influence – the changes in temperature, ice extent, moisture, and circulation patterns fit together in a physically consistent way, like pieces in a complex puzzle.

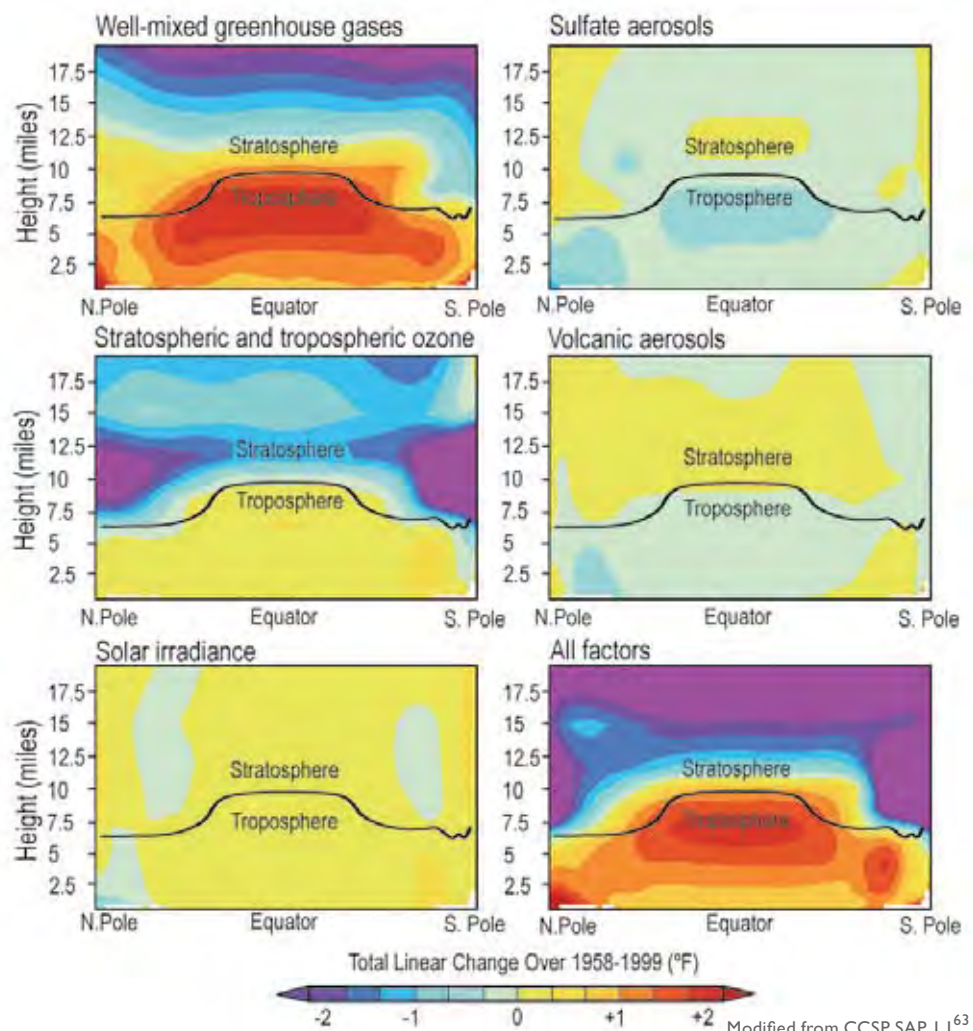
Increasingly, this type of fingerprint work is shifting its emphasis. As noted, clear and compelling scientific evidence supports the case for a pronounced human influence on global climate. Much of the recent attention is now on climate changes at continental and regional scales,^{64,65} and on variables that can have large impacts on societies. For example, scientists have established causal links between human activities and the changes in snowpack, maximum and minimum temperature, and the seasonal timing of runoff over mountainous regions of the western United States.³⁴ Human activity is likely to have made a substantial contribution to ocean surface temperature changes in hurricane formation regions.⁶⁶⁻⁶⁸ Researchers are also looking beyond the physical climate system, and are beginning to tie changes in the distribution and seasonal behavior of plant and animal species to human-caused changes in temperature and precipitation.^{69,70}

For over a decade, one aspect of the climate change story seemed to show a significant difference between models and observations.¹⁴

In the tropics, all models predicted that with a rise in greenhouse gases, the troposphere would be expected to warm more rapidly than the surface. Observations from weather balloons, satellites, and surface thermometers seemed to show the opposite behavior (more rapid warming of the surface than the troposphere). This issue was a stumbling block in our understanding of the causes of climate change. It is now largely resolved.⁷¹ Research showed that there were large uncertainties in the satellite and weather balloon data. When uncertainties in models and observations are properly accounted for, newer observational data sets (with better treatment of known problems) are in agreement with climate model results.^{31,72-75}



Patterns of Temperature Change
Produced by Various Atmospheric Factors, 1958-1999



Climate simulations of the vertical profile of temperature change due to various factors, and the effect due to all factors taken together. The panels above represent a cross-section of the atmosphere from the north pole to the south pole, and from the surface up into the stratosphere. The black lines show the location of the tropopause, the boundary between the lower atmosphere (troposphere) and the stratosphere.

EXHIBIT 6

**David Rose, “Glacier
Scientist: I Knew Data Hadn’t
Been Verified,” *Daily Mail*
Online (Jan. 24, 2010)**

[Click here to print](#)

MailOnline

Glacier scientist: I knew data hadn't been verified

By [David Rose](#)

Last updated at 12:54 AM on 24th January 2010

The scientist behind the bogus claim in a Nobel Prize-winning UN report that Himalayan glaciers will have melted by 2035 last night admitted it was included purely to put political pressure on world leaders.

Dr Murari Lal also said he was well aware the statement, in the 2007 report by the Intergovernmental Panel on Climate Change (IPCC), did not rest on peer-reviewed scientific research.

In an interview with The Mail on Sunday, Dr Lal, the co-ordinating lead author of the report's chapter on Asia, said: 'It related to several countries in this region and their water sources. We thought that if we can highlight it, it will impact policy-makers and politicians and encourage them to take some concrete action.'

'It had importance for the region, so we thought we should put it in.'



Chilling error: The Intergovernmental Panel on Climate Change wrongly asserted that glaciers in the Himalayas would melt by 2035

Dr Lal's admission will only add to the mounting furore over the melting glaciers assertion, which the IPCC was last week forced to withdraw because it has no scientific foundation.

According to the IPCC's statement of principles, its role is 'to assess on a comprehensive, objective, open and transparent basis, scientific, technical and socio-economic information – IPCC reports should be neutral with respect to policy'.

The claim that Himalayan glaciers are set to disappear by 2035 rests on two 1999 magazine interviews with glaciologist Syed Hasnain, which were then recycled without any further investigation in a 2005 report by the environmental campaign group WWF.

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It was this report that Dr Lal and his team cited as their source.

The WWF article also contained a basic error in its arithmetic. A claim that one glacier was retreating at the alarming rate of 134 metres a year should in fact have said 23 metres – the authors had divided the total loss measured over 121 years by 21, not 121.

Last Friday, the WWF website posted a humiliating statement recognising the claim as ‘unsound’, and saying it ‘regrets any confusion caused’.

Dr Lal said: ‘We knew the WWF report with the 2035 date was “grey literature” [material not published in a peer-reviewed journal]. But it was never picked up by any of the authors in our working group, nor by any of the more than 500 external reviewers, by the governments to which it was sent, or by the final IPCC review editors.’

In fact, the 2035 melting date seems to have been plucked from thin air.

Professor Graham Cogley, a glacier expert at Trent University in Canada, who began to raise doubts in scientific circles last year, said the claim multiplies the rate at which glaciers have been seen to melt by a factor of about 25.

‘My educated guess is that there will be somewhat less ice in 2035 than there is now,’ he said.



Forced to apologise: Chairman of the IPCC Raj Pachauri

‘But there is no way the glaciers will be close to disappearing. It doesn’t seem to me that exaggerating the problem’s seriousness is going to help solve it.’

One of the problems bedevilling Himalayan glacier research is a lack of reliable data. But an authoritative report published last November by the Indian government said: ‘Himalayan glaciers have not in any way exhibited, especially in recent years, an abnormal annual retreat.’

When this report was issued, Raj Pachauri, the IPCC chairman, denounced it as ‘voodoo science’.

Having been forced to apologise over the 2035 claim, Dr Pachauri blamed Dr Lal, saying his team had failed to apply IPCC procedures.

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It was an accusation rebutted angrily by Dr Lal. 'We as authors followed them to the letter,' he said. 'Had we received information that undermined the claim, we would have included it.'

However, an analysis of those 500-plus formal review comments, to be published tomorrow by the Global Warming Policy Foundation (GWPF), the new body founded by former Chancellor Nigel Lawson, suggests that when reviewers did raise issues that called the claim into question, Dr Lal and his colleagues simply ignored them.

For example, Hayley Fowler of Newcastle University, suggested that their draft did not mention that Himalayan glaciers in the Karakoram range are growing rapidly, citing a paper published in the influential journal Nature.

In their response, the IPCC authors said, bizarrely, that they were 'unable to get hold of the suggested references', but would 'consider' this in their final version. They failed to do so.

The Japanese government commented that the draft did not clarify what it meant by stating that the likelihood of the glaciers disappearing by 2035 was 'very high'. 'What is the confidence level?' it asked.

The authors' response said 'appropriate revisions and editing made'. But the final version was identical to their draft.

Last week, Professor Georg Kaser, a glacier expert from Austria, who was lead author of a different chapter in the IPCC report, said when he became aware of the 2035 claim a few months before the report was published, he wrote to Dr Lal, urging him to withdraw it as patently untrue.

Dr Lal claimed he never received this letter. 'He didn't contact me or any of the other authors of the chapter,' he said.

The damage to the IPCC's reputation, already tarnished by last year's 'Warmergate' leaked email scandal, is likely to be considerable.

Benny Peiser, the GWPF's director, said the affair suggested the IPCC review process was 'skewed by a bias towards alarmist assessments'.

Environmentalist Alton Byers said the panel's credibility had been damaged. 'They've done sloppy work,' he said. 'We need better research on the ground, not unreliable predictions derived from computer models.'

Last night, Dr Pachauri defended the IPCC, saying it was wrong to generalise based on a single mistake. 'Our procedure is robust,' he added.

Comments (36)

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This really is an embarrassment.

"Our procedure is robust."

"Procedure" being:

1. Sensationalize the effects of global warming.
2. Manufacture reports/cherry-pick data that support your 'sky is falling' scenarios.
3. ?
4. Profit

robust indeed.

- Hal Michaels, Halifax, Nova Scotia, 24/1/2010 11:49

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Click to rate __ Rating 537

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Once more the sky is falling global warming people have been proven to manipulate data and lie to keep their pet donkey walking along what ever path they want.

- Tom, aylesbury, 24/1/2010 11:43

Click to rate __ Rating 479

[Report abuse](#)

The real scandal here is with the BBC who report these blatant lies as facts then NEVER retract them when they are proved to be wrong.

- Martin, Ashford, 24/1/2010 11:13

Click to rate __ Rating 574

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Can we please recognize that this was not a mistake, this was a deliberate action to create the myth of man made global warming, something they have knew about and used as propaganda for ten years. That deliberate false statment brought to the IPCC's attention many times before by external scientists. Pachauri knows he is untouchable, that is why he was not a salaried employee with a contract at the IPCC.

The UN is an uncontrollable machine infiltrated by Pachauris at all levels within the various bodies.

- Jennifer, Doncaster, 24/1/2010 11:09

Click to rate __ Rating 565

[Report abuse](#)

Right - that's THE END of all the ACC lies for once and for all...

Got that Brown? Got that Cameron? Got that BBC?

- Rusty, Surrey, 24/1/2010 11:06

Click to rate __ Rating 350

[Report abuse](#)

Looks like its all falling apart for global warming - just hope the IPCC pays back the trillions of dollars its received and is prosecuted for misleading the world!

- Janet, Liverpool, 24/1/2010 10:45

Click to rate __ Rating 508

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EXHIBIT 7

EPA's Response to the Petitions to Reconsider, Vol. 2 (excerpts)



EPA's Response to the Petitions to Reconsider the Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act

Volume 2: Issues Raised by Petitioners on EPA's Use of IPCC

**U.S. Environmental Protection Agency
Office of Atmospheric Programs
Climate Change Division
Washington, D.C.**

of various climate change scientists were addressed in AR4. She was clearly trying to acknowledge and respond to their concerns, even to the point of reading blogs to better understand their arguments when there was no peer-reviewed literature articulating their points. In response, Jonathan Overpeck, Tim Osborn, and Keith Briffa discussed a number of options for presenting their data on normalized temperature anomalies: first extending the timeline to 1500 A.D. to address the concerns with data around 1450 A.D., then extending the timeline to the present day to provide even more context for these early data. They discussed and ultimately decided to modify the graphic to depict the relationship of the MWP to the 20th century because that approach would provide important context for understanding current temperature trends, it would be “looking at this issue from every angle. And, we’re letting others see the issue from every angle.” There is no evidence of bias in this decision. Their presentation of various options for the graphic demonstrates their commitment to considering alternative viewpoints and thoroughness in assessing the science. The e-mails speak for themselves and show no inappropriate behavior among these individuals. We disagree with the petitioner that these e-mails indicate that the scientists were trying to present science that is not neutral or were motivated by a desire to present a “strong case” rather than to present the best science. We further note that this graphic went through expert and governmental review and was deemed appropriate for inclusion in the IPCC chapter. The petitioner provided no additional evidence beyond the text of the e-mails to further justify this allegation.

Thus, these e-mails do nothing more than indicate that three scientists were trying to present a figure that was comprehensive and offered key contextual information on temperature trends over the past several centuries. There is nothing inappropriate or biased about that, and the petitioner has not provided evidence suggesting that there was. When examined in their full context, the e-mails do not indicate any wrongdoing by the three scientists or support the petitioner’s claims.

Comment (2-23):

In support of their argument that the IPCC is a politicized and biased organization, the Competitive Enterprise Institute provided a quote from the Environment Minister of India in which he responds to the incorrect IPCC conclusion of disappearing glaciers by announcing that India is forming its own independent climate change review panel that will not depend on IPCC reports. The Minister stated that “There is a fine line between climate science and climate evangelism. I am all for climate science but not for climate evangelism. I think people misused the IPCC report” (Indo-Asian News Service, 2010).

Response (2-23):

See Subsection 2.1.3 in this Volume of the RTP document for EPA’s responses regarding the validity of the IPCC’s Himalayan glacier projection and our conclusion that this error does not undermine the IPCC’s broader findings and the technical support for endangerment.

With respect to the implications of the statements from the Indian Environment Minister, Jairam Ramesh, they clearly show that he disagreed with the specific IPCC Himalayan glacier projection that has been identified as being an error. His statement indicates that he thought that the projection was inappropriately developed based on inconclusive science. As described in Subsection 2.1.3, the IPCC’s overall assessment of observed glacier loss, projected glacier loss,

and the impacts of glacier loss on water resources in the Himalayas was not compromised by this single faulty projection. Numerous studies cited by the IPCC document a general decline in Himalayan glacier mass, project substantial future declines, and discuss the impacts of these changes on water resources and society, which is consistent with the conclusions drawn by the IPCC.

The evidence provided by the petitioner appears to mischaracterize the Minister's position. The Minister did not make any statements that support the petitioner's allegation that the IPCC is biased or politicized. Rather, the Minister expressed his disapproval of the incorrect glacier projections and stated that India needed to perform its own research related to this issue and other climate change impacts in the country. Specifically, the Minister stated (Indo-Asian News Service, 2010):

I respect the IPCC. At the same time India is a large country... we can't depend only on IPCC. So we have launched the Indian Network on Comprehensive Climate Change Assessment... It's got 125 research institutions from across the country. We will have international collaborations. It's a kind of an Indian IPCC and not a rival to the IPCC. We will do our own assessment.

It is not uncommon for countries to undertake their own climate change assessments, and it is misleading for the petitioner to imply that the Minister's statements represent a lack of faith in the IPCC. Finally, even if the statements by the Minister were to be stretched and interpreted as a comment about the IPCC as a politicized organization, it would be the view of one representative of one country and would not represent the official position of the 194 countries that participate in the IPCC. The fact that another country chooses to complement the IPCC with another assessment process has no implications for the Endangerment Finding. For example, the United States has its own climate change science assessment process that is administered by the USGCRP, and this body has provided excellent and robust information.

Comment (2-24):

The Competitive Enterprise Institute and Ohio Coal Association argue that the IPCC is "not a scientific organization," that people in the organization realize it is not, and that the IPCC is a political "organization that reviews and reports science that support its goals." In support of their argument, the petitioner provided a quote from *The Guardian* (a UK newspaper) which in turn quoted Anton Imeson, a former IPCC Working Group II author:

The Nobel prize was for peace not science ... government employees will use it to negotiate changes and a redistribution of resources. It is not a scientific analysis of climate change... For the media, the IPCC assessments have become an icon for something they are not. To make sure that it does not happen again, the IPCC should change its name and become part of something else. The IPCC should have never allowed itself to be branded as a scientific organization.

Response (2-24):

The quote provided by the petitioner comes from a newspaper article in *The Guardian* (Adam and Goldenberg, 2010), not a scientific journal or a comprehensive review of the IPCC. Imeson

considered a range of studies, including those that disagree with the conclusions of the assessment literature.

2.2.3.4 Allegations That IPCC Lead Authors Forced Consensus and Suppressed Dissenting Views

Comment (2-27):

The Southeastern Legal Foundation, the State of Texas, Peabody Energy, the Competitive Enterprise Institute, and the Ohio Coal Association argue that the CRU e-mails (in particular an e-mail from Phil Jones to Michael Mann expressing their disapproval of two new studies authored by Stephen McIntyre and Ross McKittrick) reveal that the contents of the IPCC reports, in this case Chapter 3 of the AR4 Working Group I report (Trenberth et al., 2007), were altered to eliminate any suggestion of non-consensus on key issues. Petitioners claim that this occurred so as to support a specific policy agenda, and that dissenting views were not given appropriate attention and consideration. The petitioners also argue that a group of authors have actively tried to suppress external challenges to consensus.

Response (2-27):

Although the petitioners draw broad conclusions of unethical and biased conduct from the e-mail between Phil Jones and Michael Mann, this e-mail does not show that the two IPCC authors acted unethically, or that they took any actions to suppress dissenting views, as alleged by the petitioners. The e-mail at issue was sent on July 8, 2008, and states:

Mike,

Only have it in the pdf form. FYI ONLY - don't pass on. Relevant paras are the last 2 in section 4 on p13. As I said it is worded carefully due to Adrian knowing Eugenia for years. He knows they're wrong, but he succumbed to her almost pleading with him to tone it down as it might affect her proposals in the future ! I didn't say any of this, so be careful how you use it - if at all. Keep quiet also that you have the pdf. The attachment is a very good paper - I've been pushing Adrian over the last weeks to get it submitted to JGR or J. Climate. The main results are great for CRU and also for ERA-40. The basic message is clear - you have to put enough surface and sonde obs into a model to produce Reanalyses. The jumps when the data input change stand out so clearly. NCEP does many odd things also around sea ice and over snow and ice. The other paper by MM is just garbage - as you knew. De Freitas again. Pielke is also losing all credibility as well by replying to the mad Finn as well - frequently as I see it. I can't see either of these papers being in the next IPCC report. Kevin and I will keep them out somehow - even if we have to redefine what the peer-review literature is!

Cheers Phil²⁰

The e-mail shows that Phil Jones strongly disapproved of the quality of the two studies²¹ and that he did not deem them to be of sufficient quality and credibility for inclusion in an IPCC

²⁰ E-mail file 1089318616.txt, (July 8, 2008), Page 720, Line 46 of PDF version entitled: CRU Emails 1996-2009.pdf

²¹ The paper Jones refers to by "MM" was McKittrick and Michaels (2004). It is not clear what the second paper is, however it was possibly De Laat and Maurellis (2006).

assessment report. In addition, both of the papers were in fact included in the IPCC assessment report. The “MM” study (McKittrick and Michaels, 2004) is referenced in the IPCC chapter, and assuming that the second study Jones referred to is De Laat and Maurellis (2006), that was included as well. This disproves the allegations of the petitioners that this e-mail is evidence that dissenting views were suppressed or that the IPCC assessment report was biased by such efforts. For example, these two studies are discussed in Chapter 3 (Trenberth et al., 2007):

McKittrick and Michaels (2004) and De Laat and Maurellis (2006) attempted to demonstrate that geographical patterns of warming trends over land are strongly correlated with geographical patterns of industrial and socioeconomic development, implying that urbanization and related land surface changes have caused much of the observed warming.

Thus, the events surrounding the citation of the McKittrick and Michaels (2004) and De Laat and Maurellis (2006) studies provide stronger support for the proposition that the IPCC assessed and cited critical literature than for the petitioners’ view that these events demonstrate that the IPCC is biased.

The e-mail between Jones and Mann, which is the only evidence offered by petitioners to support this allegation, simply does not show that either 1) the contents of this chapter, let alone all of the IPCC assessment reports, were altered to eliminate a suggestion of nonconsensus, or 2) IPCC authors actively tried to suppress external challenges to consensus. It is not uncommon for scientists to disagree with the work of others, and this e-mail does not provide evidence that Phil Jones or any other IPCC author acted unethically or took actions to suppress dissenting views, notwithstanding the loose talk in the e-mail.

Our conclusion regarding this e-mail is consistent with the findings of the Independent Climate Change E-mails Review investigation, which concluded “that it is not uncommon for strongly opposed and robustly expressed positions to be taken up in heavily contested areas of science. We take the view that such behaviour does not in general threaten the integrity of peer review or publication.” The final report of the investigation also stated that the panel has “not found any direct evidence to support the allegation that members of CRU [in this case Phil Jones] misused their position on IPCC to seek to prevent the publication of opposing ideas”(Russell, 2010). On this issue, Brian Hoskins, one of three review editors for Chapter 3, provided statements to the Independent Climate Change E-mails Review that were summarized in the panel’s report as stating (Russell, 2010):

Hoskins confirmed that Las [lead authors], working individually and as small groups, were responsible for the collation and primary assessment of material relevant to the topics for which they were responsible. The CLAs [convening lead authors] led the plenary meetings of the writing team prior to production of each of the drafts, led the process of overall collation of the Chapter material and the production of the initial drafts of the First and Second Draft Reports and the Final Draft Report of the Chapter. These drafts were discussed and agreed during plenary meetings of the whole writing team.

There were a very large number of comments from reviewers, of which a majority were from a relatively small group. The Review Editors made sure that they were all given proper consideration, and that they were either responded to by a change in the text or by an adequate reason for omission that was recorded in the author responses to expert and governmental review comments. Hoskins, as a Review Editor, took part in the Chapter 3 plenary discussions and ensured that conflicting views were addressed.

Led by the two CLAs, Jones and Trenberth, the writing team for Chapter 3 was assiduous in dealing with comments. Hoskins was very impressed by Jones' attention to detail, and the rigor of the Chapter 3 process.

The levels of confidence and uncertainty reflected in the drafts were based on the consensus of a group of CLAs and LAs who were chosen for their expertise and experience in relevant fields. Irrespective of whether a paper is published in a peer reviewed journal, it is the responsibility of the whole team to assess whether a paper's conclusions are robust and to justify whether its arguments should carry weight in the assessment. These decisions for each draft were taken in plenary sessions of the whole team. Hoskins said that it is inconceivable that a paper making significant claims relevant to the work of IPCC and the Chapter 3 team would not be considered by the team as a whole. The basis for rejecting one of the papers that is a focus of the allegation is included in IPCC records. Decisions about the inclusion of the MM2004 [McKittrick and Michaels] paper would have been taken by the whole team. Jones' voice would have been one amongst many.

The petitioners do not present scientific evidence or argument showing that the IPCC assessment is inaccurate or that it does not appropriately reflect the degree of scientific consensus on the issues discussed. The petitioner's broad conclusion that this is the case is unsupported by evidence or arguments on the science and assessment literature itself. Finally, we note that the science regarding this issue was raised in the comment period for the Endangerment Finding and responded to in Response 2-29 of the RTC document. Response 2-29 states:

"In the case of de Laat and Maurellis (2006) and an earlier paper by McKittrick and Michaels (2004), IPCC (Trenberth et al., 2007) assessed these papers and noted that the locations of greatest socioeconomic development coincided with those most warmed by atmospheric circulation changes, which are not limited to urban areas but rather have large-scale coherence. When this is taken into account, IPCC concludes that the correlation of warming with industrial and socioeconomic development ceases to be statistically significant."

EXHIBIT 8

IPCC, Memorandum on the Role of the IPCC and Key Elements of the IPCC Assessment Process

GENEVA, 4 February 2010

The role of the IPCC and key elements of the IPCC assessment process

The IPCC is an intergovernmental body sponsored by UNEP and WMO. The main decision-making body is the “Panel” which meets at regular intervals in plenary sessions at the level of government representatives of all 194 IPCC member countries. Its role as defined in the “Principles Governing IPCC Work” is *“to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation. IPCC reports should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies. Review is an essential part of the IPCC process. Since the IPCC is an intergovernmental body, review of IPCC documents should involve both peer review by experts and review by governments.”*

The IPCC fulfills this role by preparing reports at regular intervals, including assessment reports, methodology reports and special reports. The drafting and review of these reports follows clear procedures. Key elements of the IPCC process and procedures include:

Development of the scope of a report in consultation between experts and governments and decision on the outlines by the Panel

- This step should ensure that relevant scientific developments as well as the information needs of policymakers are reflected in the upcoming reports.

Author teams that reflect a wide range of expertise and views and work on a voluntary basis

- Author teams for the chapters of IPCC reports should represent a range of views and expertise as well as appropriate geographical representation. The IPCC also aims for gender balance. This is achieved through a wide nomination and selection process, as is currently ongoing for the Fifth Assessment Report (AR5).
- More than 450 Lead Authors and more than 800 Contributing Authors (CAs) have contributed to the Fourth Assessment Report (AR4). They were selected from around 2000 nominations.
- All experts contributing to the report work for the IPCC on a voluntary basis and are compensated by the IPCC only for their travel expenses to the necessary meetings, including that of the Chair of the IPCC and all of the elected leadership.

A writing process based as far as possible on peer-reviewed and internationally available literature

- The authors will work on the basis of peer reviewed and internationally available literature, including manuscripts that can be made available for IPCC review and selected non-peer reviewed literature as necessary.
- Materials relevant to IPCC Reports, in particular, information about the experiences and practices of the private sector in mitigation and adaptation activities, are also found in sources that have not been published or peer-reviewed (e.g., industry journals, internal organisational publications, non-peer reviewed reports or working papers of research institutions, proceedings of workshops, etc.). A lot of relevant information appears also in

government reports and publications from international organizations. To make all references used in IPCC Reports easily accessible and to ensure that the IPCC process remains open and transparent, additional procedures have been agreed for the use of such sources, often referred to as “grey literature”.

- Authors who wish to include information from a non-published/non-peer-reviewed source, are requested to critically assess and review the quality and validity of each source before incorporating results into an IPCC Report.
- The Co-chairs have to collect and index non-publicly available sources as well as the accompanying information received from authors about each source and make copies available to reviewers upon request during the review process.
- The IPCC uses also expert meetings and workshops to support the assessment process.
- Conclusions in IPCC reports are based on multiple lines of evidence and a wide range of scientific technical literature.

A multi stage and transparent review process involving experts and governments

- The IPCC Review entails multiple stages aimed at ensuring that the best possible scientific and technical advice be included, so that the IPCC Reports represent the latest scientific, technical and socio-economic findings, and are as comprehensive as possible. Draft reports are circulated among independent experts from all relevant fields of expertise and all regions, and in a second stage to government reviewers as well. Experts can send comments on the draft text. It is a process with a very wide circulation, which in principle any scientific expert can join.
- Normally two Review Editors per chapter ensure that all substantive expert and government review comments are afforded appropriate consideration so that IPCC Reports provide a balanced and complete assessment of current information.
- To ensure objectivity and transparency, review comments are made available to reviewers on request during the IPCC review process. On completion of a Report all review comments and responses by authors are retained in an open archive (AR4 comments are linked from the IPCC website and respective Working Groups' websites¹) for a period of at least five years.
- In preparing the draft and final report, authors should clearly identify and describe different (possibly controversial) scientific, technical, and socio-economic views on a subject, together with the relevant arguments, particularly if they are relevant to the policy debate.

Approval, acceptance and adoption of IPCC reports and their summaries by the Panel

- The Summaries for Policy Makers (SPM), which summarize the key findings of each report, are prepared concurrently with the preparation of the main Reports and are subject to simultaneous review by both experts and governments. They are subject to a final line-by-line approval in a Plenary Session, which all IPCC member countries are invited to join. In case of Report prepared by one or two Working Groups this will be done at a Working Group or joint Working Group Session or a Panel Session - in the case of reports being prepared by all WGs or the TFI.
- Approval of the Summary for Policymakers signifies that it is consistent with the factual material contained in the full scientific, technical and socioeconomic assessment. During the Session, Coordinating Lead Authors may be asked to provide technical assistance in ensuring that consistency.
- The Synthesis Report (SYR) synthesizes and integrates materials contained within the IPCC Reports (Assessment and Special Reports) and addresses a broad range of policy-relevant but policy-neutral questions. The SYR SPM is approved line-by-line and the longer report adopted section by section to ensure consistency with the SPM and the underlying Reports.
- The *underlying* Reports (of Assessment, Special and Methodology Reports) are accepted at a Session of the Working Group or Panel. While they are not subject to line-by-line discussion and agreement, approval by member countries signifies that the material presents a comprehensive, objective and balanced view of the subject matter.

Consistent communication of uncertainties

¹ For WG I: <http://hcl.harvard.edu/collections/ipcc/index.html>

For WG II: http://www.ipcc-wg2.gov/publications/AR4/ar4review_access.html

For WG III: <http://www.ipcc-wg3.de/publications/assessment-reports/ar4/forth-assessment-review-comments>

- To assist Lead Authors of the Fourth Assessment Report in the consistent presentation of scientific uncertainties, uncertainty guidelines were prepared. They address approaches to developing expert judgments, evaluating uncertainties, and communicating uncertainty and confidence in findings that arise through the assessment process.
- Based on these guidelines, the AR4 authors assigned confidence levels to the major statements in the Summary for Policymakers. These range from very high to very low confidence.
- Authors also evaluated the likelihood, which refers to a probabilistic assessment of some well-defined outcome having occurred or occurring in the future, for certain outcomes in the Summary for Policymakers, with a range from *virtually certain* to *very unlikely*.

A budget based mainly on voluntary contributions from governments and in kind contributions from governments, research institutions and researchers

- The IPCC Budget is based on regular contributions from the two sponsoring organizations WMO and UNEP, which provide cash and one senior post in the IPCC Secretariat and regular contributions from the UNFCCC as agreed by the Parties. The largest share of contributions comes from governments on a voluntary basis.
- The contributions are managed under the IPCC Trust Fund. Annual expenditures are decided and reviewed by the Panel, consistent with the IPCC financial procedures and WMO Financial Regulations.
- Main items of expenditure are travel support for experts from developing countries and from countries with economies in transition (EIT), meeting costs, interpretation and translation, information and outreach activities and staff in the IPCC Secretariat.
- Large additional contributions to the work of the IPCC are provided by the governments who host Technical Support Units (TSUs) for IPCC Working Groups and the Task Force on National Greenhouse Gas Inventories (currently Switzerland, US, Germany and Japan).
- Further in-kind contributions are provided by countries hosting IPCC Sessions and meetings, hosting the Data Distribution Center and through their support for expert participation in IPCC work.
- Authors and elected members of the IPCC Bureau (currently 31 persons) work on a voluntary basis and do not receive any honoraria or compensation from the IPCC. The IPCC only provides travel costs for experts and members of the IPCC Bureau from developing countries and countries with Economies in Transition for participation in IPCC meetings or for giving presentations on behalf of the IPCC. A small contribution for administrative costs incurred is provided for Co-chairs (currently 5 persons) from developing countries.

EXHIBIT 9

History of the Climatic Research Unit

[Climatic Research Unit : About CRU](#)

History of the Climatic Research Unit

The Climatic Research Unit (CRU) was established in the School of Environmental Sciences (ENV) at the University of East Anglia (UEA) in Norwich in 1972. The contribution of the Founding Director, Professor Hubert H Lamb, cannot be overstated. Hubert Lamb's determination and vision can only be appreciated against the view, generally prevailing within the scientific establishment in the 1960s, that the climate for all practical purposes could be treated as constant. The weather changed from day-to-day, from week-to-week, and season-to-season. There was interannual variability, but over years (the perceived argument went) a constancy was reliably evident. It is now recognised that the climate is not constant, but changes on timescales which are of relevance to humanity and its social and economic systems. [Hubert Lamb](#), encouraged by the support of Keith Clayton and Brian Funnell, Deans of ENV around the time, made the brave decision in 1971 that his pioneering work on climate change would be best conducted at a university.

Many climatologists will now say that CRU's work in these early years played a major part in navigating the study of climate change out of an academic backwater and started to set the agenda for the major research effort in, and political preoccupation with, climate research since. The purpose of this brief history is to document some of these achievements by subject, in a loose chronological order. [A list of all the staff and students is given here.](#)

Hubert Lamb retired as Director in 1978. He was succeeded by Tom Wigley (to 1993), Trevor Davies (1993-1998), Jean Palutikof and Phil Jones (jointly from 1998 to 2004) and Phil Jones (to the present). Each has brought their own specialities to bear in guiding CRU through what have been generally good times as far as successful funding is concerned, but occasionally through fallow periods.

Since its inception in 1972 until 1994, the only scientist who had a guaranteed salary from ENV/UEA funding was the Director. Every other research scientist relied on 'soft money' - grants and contracts - to continue his or her work. Since 1994, the situation has improved and now three of the senior staff are fully funded by ENV/UEA and two others have part of their salaries paid. The fact that CRU has and has had a number of long-standing research staff is testimony to the quality and relevance of our work. Such longevity in a research centre, dependent principally on soft money, in the UK university system is probably unprecedented. The number of CRU research staff as of the end of July 2007 is 15 (including those fully funded by ENV/UEA).

The early priority of CRU was set against the backdrop of there having been little investigation before the 1960s of past climatic changes and variability, except by geologists and botanists, although there was an excess of theories. The objective of CRU, therefore, was "to establish the past record of climate over as much of the world as possible, as far back in time as was feasible, and in enough detail to recognise and establish the basic processes, interactions, and evolutions in the Earth's fluid envelopes and those involving the Earth's crust and its vegetation cover". The early efforts towards this objective were the interpretation of documentary historical records. This was painstaking and challenging work and progressed through the 1970s.

CRU Directors



Hubert Lamb



Tom Wigley



Trevor Davies

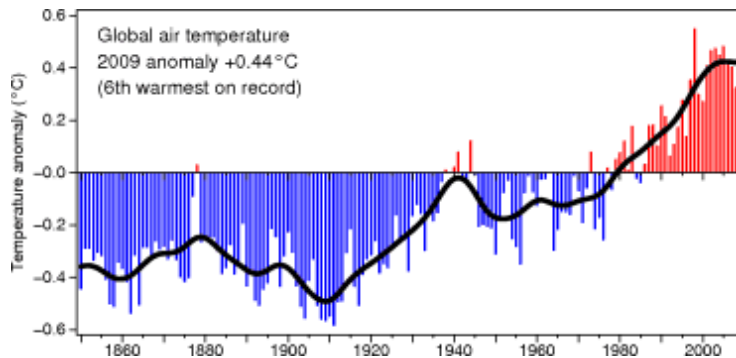


Jean Palutikof



Phil Jones

In 1979, CRU hosted a remarkable, international, interdisciplinary conference (Climate and History), a turning point for the future work on historical climatology and the influence of climate on human societies. This type of work still has an important place in CRU's research portfolio to the present day, although it has broadened to include the development and analysis of early instrumental records and the extension of important climate indicators and datasets as far back in time as possible. A second international conference again focussing on historical climate variations and their links with societal change, but with a view to future changes and interactions, was held in 1998. An almost complete [list of CRU publications is given here](#), including the volumes resulting from these two conferences.



The area of CRU's work that has probably had the largest international impact was started in 1978 and continues through to the present-day: the production of the world's land-based, gridded (currently using 5° by 5° latitude/longitude boxes) temperature data set. This involved many person-years of painstaking data collection, checking and homogenization. In 1986, this analysis was extended to the marine sector (in co-

operation with the Hadley Centre, Met Office from 1989), and so represented the first-ever synthesis of land and marine temperature data - i.e., the first truly global temperature record, demonstrating unequivocally that the globe has warmed by almost 0.8°C over the last 157 years. This work continues year-on-year to update and enhance the record and its publication is eagerly awaited around the world. The most recent innovation has been the development of a comprehensive set of error estimates at the grid-box and larger scales (see [Brohan et al. 2006](#) and [IPCC AR4 chapter 3](#)).

Besides the global temperature data set, there has been much CRU effort devoted to the compilation of a comprehensive, quality-controlled precipitation data base. This, together with CRU's high-resolution (0.5° by 0.5°) monthly datasets (for maximum and minimum temperature, precipitation, rainy day counts, vapour pressure, cloudiness and wind speed) for all the world's inhabited land areas, has provided many researchers, in the UK and overseas, with their basic data for a whole range of studies. It is likely that CRU ranks only behind [NCEP/NCAR](#), [ECMWF \(ERA-40\)](#) and [NCDC](#) as the acknowledged primary data source by climate scientists around the world.

The vast potential of tree rings to provide annually-resolved climate reconstructions over thousands of years has been exploited by the application of rigorous statistical methods to tree-ring data. In collaboration with a number of institutions throughout the world - in particular through a strong association with the [Institute of Forest, Snow and Landscape Research](#) in Birmensdorf, Switzerland - CRU is now regarded as one of the world's foremost exponents of dendroclimatology. On longer time scales, the first rigorous quantification of past climate from the distributions and assemblages of beetle remains was made. Understanding the past has always been a primary aim of CRU, and until recently was mainly only of academic interest. Placing the instrumental period in a longer context has provided renewed interest in proxy climate reconstruction. CRU was the first to develop a time series (based on tree-ring and other proxy climate data) of average Northern Hemisphere summer temperatures back 1000 years. This showed that the world is probably now at its warmest. Milder centuries were evident at the beginning of the millennium, with markedly cooler ones in the 17th and 19th centuries, but the average temperature for the period since 1975 is likely unprecedented during the past millennium. (see [IPCC AR4 chapter 6](#))

Another research topic explored in the early days of CRU was the Southern Oscillation and its connections to the climate around the globe. This was amongst the first work to be undertaken on this

phenomenon since its original identification by Sir Gilbert Walker in the 1920s, and presaged the later, enormous attention which would be paid to the El Niño Southern Oscillation (ENSO) phenomenon. Research here is still ongoing and has expanded to other major modes of atmospheric and ocean circulation variability (the Northern and Southern Annular Modes, North Atlantic Oscillation, North Pacific Oscillation, Pacific Decadal Oscillation and the Atlantic Multidecadal Oscillation). CRU's work in this area has extended many of the indices, assessed the influence (sometimes of a variable nature) of the phenomena on surface climate variability and evaluated how well the phenomena and their climate impacts are modelled by Global Climate Models.

As it became clearer, in the 1980s, that the world was warming, a question that was asked with increasing frequency was how much, if any, of the warming was a consequence of human activity? CRU had made an important contribution to the posing of that question, so was in an excellent position to attract some more research funding to address it. The UK Government became a strong supporter of climate research in the mid-1980s, following a meeting between Prime Minister Mrs Thatcher and a small number of climate researchers, which included Tom Wigley, the CRU director at the time. This and other meetings eventually led to the setting up of the [Hadley Centre for Climate Prediction and Research](#), within the Met Office. At the same time, other governments were also taking notice and wanted more information. As this need was not being met by international scientific bodies and institutions at the time, they set up the [Intergovernmental Panel on Climate Change](#) (IPCC). This was under the United Nations Framework (later the UN Framework Convention on Climate Change, UNFCCC) and led to assessments being produced in 1990, 1995, 2001 and 2007. CRU staff have been heavily involved in all four assessments, probably more than anywhere else relative to the size of an institution (see [IPCC AR4 Authors](#)). The most recent IPCC assessment report (in 2007) has stated - "*The warming of the climate system is unequivocal*".

In the late 1980s, CRU started to explore the pattern correlation "fingerprint" method of detection, a technique to assess how the observed pattern of climate change matches that which can be attributed to particular causes. This work culminated in 1995, when a team of researchers from American institutes and from CRU, using the computer simulations of climate change caused by increasing emissions of carbon dioxide, the most important greenhouse gas, and sulphate aerosols (developed by the Lawrence Livermore National Laboratory, USA), was able to detect the effects of these climate forcing factors in the climate observations. The results were in stark contrast to the consensus view expressed by IPCC in 1990, when it was stated that the effect of increased carbon dioxide concentrations could not yet be identified in the observed record. This work played a critical role in the conclusion reached by the 1995 assessment of the IPCC that "the balance of evidence suggests that there has been a discernible human influence on global climate". Subsequent IPCC reports have strengthened these statements (in 2001: "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities" and in 2007: "most of the observed increase in globally averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations") and led most governments, industries, multi-national companies and the majority of the public to accept that the climate is warming, and humans are part of the cause. Accepting the evidence is one thing, but not all governments appreciate the full scale of the problem yet.

CRU has also played a major role in attempts to predict future anthropogenic climate change, and some of its consequences. In the late 1970s, rapid advances were being made elsewhere in atmospheric climate modelling (using Global Climate Models, GCMs), but it would be many years before these could be coupled to ocean GCMs. CRU pioneered simpler models (Energy Balance Models, EBMs) and, unlike the computer-intensive GCMs, they allowed the consideration of the consequences of a wider range of future emission scenarios and an assessment of the uncertainties due to parameters such as the climate sensitivity. Even though the GCMs have now improved in scope and speed, these simpler models are still valuable for interpolating between, or extrapolating beyond, the results of GCMs. CRU's work with these

models led directly to the global-mean temperature projections given by the IPCC in 1990 and to corresponding projections of sea-level rise.

In 1992, CRU conducted a comprehensive integrated assessment of the climate projection problem, linking an EBM (now called [MAGICC](#)) and ice-melt models with models for translating greenhouse gas emissions to atmospheric concentrations and sulphur dioxide emissions that could be used to drive MAGICC. This work by CRU was the first attempt to consider the full spectrum of anthropogenic influences on climate in an internally consistent way. This methodology has improved, but the same basic approach is still used and remains a vital tool used by the IPCC in the construction of future climate projections, as it is able to cover a much wider range of the uncertainties in greenhouse gas and aerosol scenarios than the more computationally expensive GCMs. The dramatic increases in computer power over the last 30 years have mainly been used to increase the spatial and vertical resolution of GCMs and to simulate many more aspects of the climate system (e.g., interactive atmospheric chemistry, interactive biosphere, runoff routing). Earth System Models or Global Environmental Models (as GCMs are sometimes called) require the largest and fastest computers in the world. These resources are best allocated to improving the comprehensiveness of the models, as opposed to running extensive scenario combinations for IPCC reports every few years. MAGICC and other similar developments around the world, therefore, continue to fill an important niche.

CRU researchers have also pioneered several approaches to the construction of regional climate change scenarios which can be used in climate impact assessments, environmental planning and climate policy debates. These approaches included some of the first analogue scenarios and the development of techniques for linking results from simple and complex climate models. In the 1990s, CRU incorporated model-based scenarios into integrated assessments of climate change undertaken for the UK, European and US governments. This work has led to the creation of several scenario software applications which are widely used by the research communities. This scenario work has also been incorporated into IPCC reports.

Much scenario work is dependent on translating the broad-scale climate information produced by GCMs and their regional counterparts (RCMs) to a space- or time-scale which is of relevance for impact assessment (e.g., catchment or station scale and day-to-day weather). CRU pioneered some of the first work on this crucial issue of "downscaling", both from a statistical (using observed relationships between space- and time-scales) and dynamical (directly through RCMs) approach and was among the first to thoroughly compare the two approaches. Scenarios are becoming more and more detailed, and to incorporate all aspects of uncertainty (emissions, model parameterization, etc.) and different modelling frameworks (also called structural uncertainty), the next, emerging, generation is largely based on probability density functions. The UK is leading the way in these endeavours, but comprehensive education of the impacts community in the use and interpretation of probability-based information is required. CRU is taking the lead here with probability-based projections based on adapting weather generators to provide daily data (see [CRANIUM project](#)) within the next set of national scenarios ([UKCIP08](#)).

This field has also led to much work in the climate impacts field, which has become gradually more extensive to support the discussion of mitigation and adaptation options. This moved the agenda from the scientific determination of the global warming problem to how to solve the problem. In the late 1990s, the UK Research Councils recognized the need for a centre to address these issues. CRU, ENV and other groups across the UK were successful with their bid, and the [Tyndall Centre for Climate Change Research](#) was born in 2000. The Tyndall Centre focuses on solutions to the problem of climate change, while CRU continues to work on all aspects of climate science. CRU and Tyndall work together on some projects, but their specific aims and agendas are different. The growing practical applicability of CRU work is nonetheless reflected in the increasing range of academic users, stakeholders, decision makers

and professional bodies with which CRU is involved, as well as the range of impacts sectors covered. The latter include agriculture, water, health, energy and, most recently, the built environment. These aspects of CRU work in the UK are also facilitated by strong links with the [UK Climate Impacts Programme](#) (UKCIP) which was set up in 1997 - based at the University of Oxford.

From 1992-2007, CRU co-ordinated or played a key role in the Climate Impacts LINK Project, whose purpose is to disseminate the results of current climate simulations and future climate projections from the Hadley Centre's computer models to research groups in the UK and overseas, who are concerned with attempting to assess the impacts of climate change. The objectives of the LINK project are to ensure that all such groups are aware of the nature of such results, that they cannot be used uncritically, and, most importantly, that the same standard climate data sets are used as input to the many impact assessments that have been undertaken. This latter objective has helped to make the results of different impact assessments comparable, enabling a large part of the full range of potential uncertainties to be incorporated into the UKCIP08 framework of probability-based projections. A measure of the success of the LINK project in making consistent sets of past and future climate information available to non-experts, together with appropriate education and advice, is that the majority of studies to date addressing impacts of climate change around the world have used data from Hadley Centre climate models. The LINK project became the mould for data dissemination from climate modelling centres and it eventually led to the establishment by the IPCC of the [Data Distribution Centre](#) (DDC). Both projects are now led by the [British Atmospheric Data Centre](#) (BADC), but CRU is still involved.

A main thrust of the Unit's research programme since the early 1980s has, therefore, been global warming: the human contribution, the future climate response, and possible impacts of future climate change, with an increasing emphasis on adaptation to these impacts. But this was not to the exclusion of other research, much of it of commercial relevance. A few examples follow. From the late 1970s through to the collapse of oil prices in the late 1980s, CRU received a series of contracts from BP to provide data and advice concerning their exploration operations in the Arctic marginal seas. Working closely with BP's Cold Regions Group, CRU staff developed a set of detailed sea-ice atlases, covering estimates of data quality and climate variability as well as standard climatological means, and a series of reports on specific issues, such as navigation capabilities through the Canadian Archipelago. Assessment of the wind energy resource over the UK led to the development of predictive schemes to assess the potential power production at candidate wind turbine sites. Research on predicting canopy wetness as a vector for disease in cocoa plantations has been of special interest to Brazilian cocoa producers. Advice from CRU has been sought on far-future climate states in relation to the long-term safety of low- and intermediate-level radioactive waste storage sites. On shorter-term timescales, work on extreme events with implications for nuclear power station operation has been undertaken. Perhaps, not surprisingly, the insurance and re-insurance industries have been a regular sponsor of research with studies evaluating the risk of hurricane landfall on the Gulf and Atlantic coasts of the US, the impacts of severe storms in Europe and the characteristic of the typhoon risk over Japan. Former public utilities, such as the Central Electricity Generating Board (and latterly National Power) commissioned work from CRU on acid rain, wind energy, and surface ozone. Work has also been undertaken for Friends of the Earth and Greenpeace.

Returning to the beginning, Hubert Lamb's work during the early 1970s on historic North Sea storm surges contributed in no small part to the implementation of plans for a flood barrier on the River Thames, drawn up after the disastrous East Coast floods of 1953. The number of times the Thames Barrier has been closed since its completion - increasingly so in recent years because, as Lamb predicted, sea level has risen - testifies to the value of this research. Hubert Lamb's other ground-breaking research (much of it summarised in the two volumes of his landmark book *Climate: Present, Past and Future*, which appeared during the 1970s) is still widely cited in science articles today.

Today, CRU is still dependent upon research grant income to maintain the size and breadth of our

research and student communities. The European Commission of the European Union (EU) provides the largest fraction of our research income under the Environment and Climate Change Programme. Since the mid-1990s, CRU has co-ordinated 9 EU research projects and been a partner on 16 others within the 4th, 5th and 6th [Framework Programmes](#). Although EU funding is very important, we also endeavour to maintain the diverse pattern of funding reflected by the research described in this "history of CRU" and in the list of Acknowledgements below.

Since its inception in 1972, [over 40 students have been awarded PhD degrees](#), and the rate of awards has dramatically grown in the last 10 years. Today, CRU has a thriving student community of 11 PhD students (July 2007). CRU also runs a NERC-recognized [Master of Science degree programme on Climate Change](#). For the past 10 years, this degree attracted between 6 and 10 students per year, but the last two academic years (2005/06 to 2006/07) have seen an upsurge to 22 students per year. This is a strong endorsement of the growing importance of the subject and of our reputation.

A number of CRU staff have been awarded medals, certificates or fellowships from the Royal Meteorological Society, the European Geosciences Union, the American Meteorological Society, the American Geophysical Union and the Leverhulme Trust. Over the last 35 years also, several staff have been on the editorial boards of a number of major climatic journals ([International Journal of Climatology](#), [Climatic Change](#), [Weather](#), [Atmospheric Science Letters](#), [Journal of Climate](#), [The Holocene](#), [Boreas](#), [Climate Research](#), [Theoretical and Applied Climatology](#)).

A research unit this size doesn't run itself. The Directors and Research Staff over the years have been supported by a number of administrative, secretarial and other support staff, although this number has fallen in the last decade due to changes in working practices, organisation and information technology. This technology, however, doesn't manage or maintain itself. CRU foresaw at the birth of personal computers that a permanent staff member was vital to keep everyone going and keep them up-to-date. In the early days this was difficult to justify on research grants, but Mike Salmon is now on the ENV support staff and manages CRU computers and in a large part of ENV. He also manages our web site - 'which as ever reigns supreme' according to the *New Scientist*.

Acknowledgements

This list is not fully exhaustive, but we would like to acknowledge the support of the following funders (in alphabetical order):

British Council, British Petroleum, Broom's Barn Sugar Beet Research Centre, Central Electricity Generating Board, Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Commercial Union, Commission of European Communities (CEC, often referred to now as EU), Council for the Central Laboratory of the Research Councils (CCLRC), Department of Energy, Department of the Environment (DETR, now DEFRA), Department of Health, Department of Trade and Industry (DTI), Eastern Electricity, Engineering and Physical Sciences Research Council (EPSRC), Environment Agency, Forestry Commission, Greenpeace International, International Institute of Environmental Development (IIED), Irish Electricity Supply Board, KFA Germany, Leverhulme Trust, Ministry of Agriculture, Fisheries and Food (MAFF), National Power, National Rivers Authority, Natural Environmental Research Council (NERC), Norwich Union, Nuclear Installations Inspectorate, Overseas Development Administration (ODA), Reinsurance Underwriters and Syndicates, Royal Society, Scientific Consultants, Science and Engineering Research Council (SERC), Scottish and Northern Ireland Forum for Environmental Research, Shell, Stockholm Environment Agency, Sultanate of Oman, Tate and Lyle, UK Met. Office, UK

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Nirex Ltd., United Nations Environment Plan (UNEP), United States Department of Energy, United States Environmental Protection Agency, Wolfson Foundation and the World Wildlife Fund for Nature (WWF).

EXHIBIT 10

**Petition of WildEarth
Guardians to U.S. Department
of the Interior (Nov. 23, 2009)**



November 23, 2009

**BY CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

Ken Salazar
United States Secretary of the Interior
Department of the Interior
1849 C Street, NW
Washington D.C. 20240

Re: Petition to Recertify the Powder River Basin as a Coal Production Region in Accordance With Federal Coal Leasing Regulations and Address Global Warming Impacts of Coal Leasing; Petition to Require Coal Companies to Pay Carbon Fee for New Leases in Order to Establish Global Warming Impact Fund.

Dear Secretary Salazar:

Pursuant to the Administrative Procedure Act (“APA”), 5 U.S.C. § 553(e) and Department of Interior regulations, 43 C.F.R. § 14.2, WildEarth Guardians hereby petitions the Secretary of the Interior to recertify the Powder River Basin of northeastern Wyoming and southeastern Montana as a coal production region in accordance with 43 C.F.R. § 3400.5 and ensure that upon recertification, leasing regulations at 43 C.F.R. § 3420, *et seq.*, are fully and properly followed. In doing so, we request the Secretary of the Interior ensure that the global warming impacts of coal leasing in the Powder River Basin are fully addressed in accordance with leasing regulations at 43 C.F.R. § 3420, *et seq.* To this end, we further petition the Secretary of the Interior to establish a carbon fee for new coal leases and lease interest transfers pursuant to the Federal Land Policy and Management Act (“FLPMA”), 43 U.S.C. § 1734(b).

WildEarth Guardians is a nonprofit, public interest organization dedicated to protecting and restoring the wildlife, wild places, and wild rivers of the American West. Through its Climate and Energy Program, WildEarth Guardians advocates for replacing fossil fuels with clean, renewable energy to safeguard public health, the environment, and the Earth’s climate.

Attached to this petition is a report prepared by WildEarth Guardians documenting and describing the shortcomings of the current federal coal leasing program in the Powder River Basin. Put simply, the current process of leasing has diminished competition and prevented the Bureau of Land Management (“BLM”) from fully analyzing and addressing the environmental impacts—in particular the global warming impacts—of coal leasing in the Powder River Basin. This is all due to the BLM’s 1990 decision to “decertify” the Powder River Coal Production

Region, which has allowed the agency to utilize a streamlined leasing process driven by coal companies and dismissive of regional environmental concerns. *See* 55 Fed. Reg. 784-785 (January 9, 1990).

It is questionable whether the 1990 decertification of the Powder River Basin was appropriate at the time. However, there is no question that it is inappropriate today. The region not only produces more coal than any other region of the United States, but is a leading contributor to nationwide greenhouse gas emissions. In 2008, the region produced 42% of all coal in the U.S.—more than any other region of the country. As the largest producer of coal in the U.S., coal mining in the Powder River Basin is therefore responsible for more greenhouse gas emissions than any other direct activity. Based on 2007 data, coal mining in the region led to the release of 877,103,673 tons (795,695,068 metric tons) of carbon dioxide, 13% of the U.S. total and 40% of all carbon dioxide released by coal-fired power plants in the country.

These impacts are projected to intensify. Twelve new coal leases have been proposed by the BLM, which would collectively mine up to 5.8 billion tons of coal—as much coal as has been mined from the region in the last 20 years. Together, these proposals threaten to lead to the release of more than 10.6 billion tons (9.63 billion metric tons) of carbon dioxide. The BLM intends to imminently begin approving these coal leases.

The BLM has asserted that the 1990 “decertification” was needed to spur interest in coal leasing in the Powder River Basin. This assertion is not supported by the record of that decision. In response to a March 2009 Freedom of Information Act request submitted to both the Montana and Wyoming BLM offices by WildEarth Guardians seeking all records supporting the 1989 decision by the Regional Coal Team to decertify the Powder River Coal Production Region, we received no records indicating that coal leasing interest was waning, that decertification would actually lead to increased leasing interest, or any other information suggesting that the Powder River Basin was no longer producing coal. In fact, it appears that the rationale for the “decertification” had nothing to do with production capacity or demand for coal; at the time, the region produced 15% of all coal in the U.S. and demand was increasing

What is apparent is that the BLM appears to have decertified the Powder River Coal Production Region so as to be able to utilize the “Lease by Application” process set forth at 43 C.F.R. § 3425. The “Lease by Application” process allows coal companies, rather than the BLM, to delineate lease boundaries and undermines the ability of the BLM to analyze and address the environmental impacts of coal leasing on a regional scale.

According to the BLM, the “Lease by Application” process was simply “deemed more appropriate” in order to facilitate expansion of existing coal mines. This rationale is not allowed by federal regulation. Indeed, although BLM may have discretion to “change” a coal production region or alter boundaries, the regulations are clear that coal production regions are to be used to identify, rank, analyze, select, and schedule lease tracts (i.e., activity planning) in accordance with 43 C.F.R. § 3420.3-1. To this end, the only time the BLM would be allowed to “decertify” a coal production region is if activity planning was inappropriate, such as in areas that were determined to be unacceptable for further consideration for leasing through any land use

planning prepared consistent with 43 C.F.R. § 3420.1-4. The BLM has never made such a determination.

Furthermore, the “Lease by Application” process is only to be used where there is an “emergency need for unleased coal” or in areas “outside coal production regions.” *See* 43 C.F.R. § 3425.0-2. It is a streamlined process meant to facilitate leasing in areas that are not producing coal, or where a genuine emergency need for unleased coal exists. Federal regulations do not allow the “Lease by Application” process to be used to facilitate expansion of existing mines. The BLM nevertheless pushed ahead with decertification of the Powder River Basin in 1990, enabling the agency to utilize the streamlined “Lease by Application” process simply to facilitate expansion of existing mines.

Importantly, the decertification of the Powder River Coal Production Region is preventing the BLM from fully analyzing and addressing the environmental impacts—in particular the global warming impacts—of coal leasing in the Powder River Basin. Under the “Lease by Application” process, environmental considerations play little, if any, role in coal leasing. Not only is the BLM prohibited from limiting coal leasing in the region based on environmental considerations, but the agency is not allowed to delineate lease boundaries that take into account environmental impacts. Although the BLM has admitted that coal from the Powder River Basin contributes to 13% of the nation’s carbon dioxide emissions, the agency is unable to limit leasing or otherwise consider alternatives that reduce the global warming impacts of coal leasing on a regional scale in the Powder River Basin.

This petition specifically requests that the Secretary of the Interior issue a notice in the Federal Register that the Powder River Basin is recertified as a coal production region. The Secretary of the Interior, through the Bureau of Land Management, is authorized to change coal production regions, or alter coal production region boundaries, through publication of a notice of change in the Federal Register in accordance with 43 C.F.R. § 3400.5. We request the Secretary undertake such an action to recertify the Powder River Coal Production Region.

We further request that the Secretary of the Interior ensure that upon recertification, leasing regulations at 43 C.F.R. § 3420, *et seq.*, are fully and properly followed by the BLM. These regulations require that the regional impacts of coal leasing be analyzed and addressed. Further, these regulations require that lease boundaries and the regional leasing schedule be based on a consideration of environmental concerns. To this end, we petition the Secretary of the Interior to ensure the BLM fully addresses the global warming impacts of coal leasing in the Powder River Basin in accordance with leasing regulations at 43 C.F.R. § 3420, *et seq.*

In addressing the global warming impacts of coal leasing in the Powder River Basin in accordance with 43 C.F.R. § 3420, *et seq.*, the BLM will not only have an affirmative duty to analyze the global warming impacts of coal leasing in the Powder River Basin, but to minimize such impacts. In doing so, we request that the Secretary of the Interior ensure the BLM reduces greenhouse gas emissions associated with coal leasing in the Powder River Basin.

The adoption of such a goal is squarely supported by President Barack Obama. On October 5, 2009, President Obama called on all federal agencies to “measure, report, and reduce

their greenhouse gas emissions from direct and indirect activities.” *See* Executive Order No. 13514. President Obama’s Executive Order directed federal agencies to establish a “percentage reduction target” for reducing direct and indirect greenhouse gas emissions by June 2010. This Executive Order came on the heels of your September 14, 2009 Secretarial Order, which called for the development of a “unified greenhouse gas emission reduction program” among Department of Interior agencies. *See* Secretarial Order No. 3289.

In furtherance of the need to reduce greenhouse gas emissions, The BLM should establish a carbon fee for new coal leases to create a Global Warming Impact Fund. The carbon fee should be established pursuant to FLPMA as a reasonable charge to reimburse the BLM for the costs of addressing the global warming impacts of coal leasing. FLPMA provides the Secretary of the Interior with authority to “require a deposit of any payments intended to reimburse the United States for reasonable costs with respect to applications,” including coal lease application. *See* 43 U.S.C. § 1734(b). Such payments are “authorized to be appropriated and made available until expended” by FLPMA. *Id.* Funds from the Global Warming Impact Fund should reimburse the BLM for renewable energy development, habitat restoration, and other efforts to address the impacts of global warming stemming from coal leasing in the Powder River Basin.

In the long-term, the goal of the Secretary of Interior should be to reduce greenhouse gases by promoting renewable energy development in the Powder River Basin and beyond. As the report attached to this petition recommends, the Department of the Interior should report on the renewable energy potential of the Powder River Basin and with the guidance of this report, develop and implement a plan to promote the expeditious development of renewable energy in the Powder River Basin.

We appreciate your time and attention to this petition and the need to address greenhouse gas emissions associated with coal mining in the Powder River Basin of northeastern Wyoming and southeastern Montana. If you have any questions, concerns, or would like to discuss the issues raised in this petition further, please contact me at the information below. Thank you.

Sincerely,

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cc: Nancy Sutley
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White House Council on Environmental Quality
722 Jackson Place, NW

Washington, D.C. 20006

Lisa Jackson
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

EXHIBIT 11

EPA's Response to Comments on the Endangerment Finding, Vol. 3 (excerpts)



Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act:

EPA's Response to Public Comments

Volume 3: Attribution of Observed Climate Change

3.0 Attribution of Observed Climate Change to Increase in Greenhouse Gas (GHG) Concentrations

Comment (3-1):

A commenter (3747.1) argues that the information EPA used as basis for the Proposed Findings does not meet EPA's information quality requirements because the Technical Support Document (TSD) does not differentiate between anthropogenic and non-anthropogenic climate forcing variables.

Response (3-1):

Please see Volume 1 of this Response to Comments document for EPA's general response to the information quality concerns submitted during the public comment process. In addition, please see previous responses in this section regarding EPA's consideration of the science on the attribution of observed climate change to increases in GHG concentrations and other substances with radiative forcing effects.

EPA appreciates the complexities of the issues raised by the commenter, however, we disagree with the comment that the TSD does not establish a reasonable baseline by differentiating between anthropogenic and non-anthropogenic climate forcing variables. Please see the Introduction and Sections 4 and 5 of the TSD for our discussion of this topic. Our treatment of this attribution issue is consistent with EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by the Environmental Protection Agency*. We note that the *Guidelines* encourage risk assessments to analyze and consider 'real world situations.' EPA's approach to and description of anthropogenic and non-anthropogenic climate forcing variables is therefore consistent with the *Guidelines* because the TSD describes the radiative forcing effects of both variables and includes an entire section on the attribution of observed climate change to anthropogenic greenhouse gas emissions at the global and continental scale. Furthermore, the Introduction of the TSD describes this approach, therefore ensuring transparency of methods employed.

Comment (3-2):

Several commenters state that specific aspects of the attribution evidence summarized in the TSD do not support the Administrator's endangerment finding.

Response (3-2):

The specific issues that underlie these comments are addressed in the responses throughout this volume, and other volumes of the Response to Comments document. With regard to the commenters' conclusion that the current science does not support an endangerment finding with respect to attribution, we disagree based on the scientific evidence before the Administrator. See the Findings, Section IV.B, "The Air Pollution is Reasonably Anticipated to Endanger Both Public Health and Welfare," for details on how the Administrator weighed the scientific evidence underlying her endangerment determination in general, and with regard to the evidence of attribution in particular.

3.1 Degree of Anthropogenic Climate Influence

Comment (3-3):

Numerous commenters (e.g., 0214, 0247, 0286, 0434, 0525, 0534, 0546, 0583, 0714.1, 1312, 2895, 3427.1, 3497.1, 3722R85, 4092, 7037) argue that anthropogenic greenhouse emissions have no effect on the climate. A second large group of commenters (e.g., 0400, 0499, 0736, 2210.4, 2818, 2933, 4003, 3427.1, 3440.1, 3450.1, 3553.1, 3596.1, 3915) do not explicitly rule out the possibility of an

anthropogenic influence on climate but state that it is likely to be minimal or insignificant, or that the current level of scientific understanding about climate and the carbon cycle involves too many uncertainties for the observed changes to be attributed to anthropogenic emissions with any degree of confidence.

Response (3-3):

We reviewed the arguments by the commenters that anthropogenic GHG emissions have minimal or no influence on the climate. While uncertainties exist, we disagree that anthropogenic GHG emissions have little to no effect on climate or that scientific understanding is inadequate for attributing climate change to human causes. We find these comments to be inconsistent with the assessment literature, which is summarized in Section III of the TSD. Studies to detect climate change and attribute its causes using patterns of observed temperature change show clear evidence of anthropogenic influence. On the basis of these studies, the Intergovernmental Panel on Climate Change (IPCC), the U.S. Climate Change Science Program (CCSP) and the U.S. Global Change Research Program (USGCRP) reports have reached high-confidence conclusions that anthropogenic GHG emissions and warming of the climate system are causally linked. The 2007 IPCC Fourth Assessment Report concluded the following about the linkage between anthropogenic GHG emissions and the observed warming: "Most of the observed increase in global average temperatures since the mid-20th century is very likely [where very likely signifies a 90-99% probability the statement is true] due to the observed increase in anthropogenic GHG concentrations." In 2009, the USGCRP reached an even stronger conclusion, unequivocally stating: "The global warming of the past 50 years is due primarily to human-induced increases in heat-trapping gases." Both of these findings are included in the TSD.

The IPCC, CCSP and USGCRP have also concluded that there is evidence of anthropogenic influence in other parts of the climate system, including ocean heat content, precipitation, and wind patterns. Comments pertaining to the degree to which changes in these parts of the climate system can be attributed to the observed increase in the atmospheric GHG concentration are covered in other responses within this section of the Response to Comments document.

As the TSD describes, the attribution of observed climate change to anthropogenic activities is based on multiple lines of evidence. The first line of evidence arises from our basic physical understanding of the effects of changing concentrations of GHGs, natural factors, and other human impacts on the climate system. The second line of evidence arises from indirect, historical estimates of past climate changes that suggest that the changes in global surface temperature over the last several decades are unusual (Karl et al., 2009). The third line of evidence arises from the use of computer-based climate models to simulate the likely patterns of response of the climate system to different forcing mechanisms (both natural and anthropogenic). We received many comments on each of these lines of evidence. See our responses regarding how GHGs trap heat in Section 3.2.2; our responses related to indirect estimates of climate change over the last 2,000 years in Volume 2; our response related to the carbon cycle in response 3-21 and Volume 2; and our responses related to the consistency between observed changes in climate and computer model simulations in both this Volume and Volume 4.

Comment (3-4):

Numerous commenters (e.g., 2253, 3205.1, 3330, 3432.1, 3569.1, 10394, 10499) posit the lack of correlation between global surface and satellite-derived temperature trends and GHG changes calls into question any cause and effect relationship. Specifically, they note global GHG emissions have dramatically risen since 2000 and yet there has not been a concomitant increase in global temperature. Some commenters point to other (prior) short periods of no temperature change or cooling to demonstrate this lack of direct correlation. Another commenter (3722) states that CO₂ concentrations do not correlate causatively with temperature records, presenting a quote by Professor Philander (Philander, 1998) that "in

contrast to the steady rise in the atmospheric concentration of carbon dioxide...temperatures have fluctuated erratically.”

Response (3-4):

We reviewed the arguments by the commenters that there is no correlation, and no cause-and-effect relationship, between GHG concentrations and global temperature trends. Climate science research and assessments have clearly established the relationship between warming and anthropogenic GHG emissions. However, the relationship is complex and non-linear. As discussed in the IPCC, CCSP, and USGCRP assessment reports, and summarized in the TSD, elevated atmospheric levels of GHGs are not the only determinant of changes in temperature at the surface and in the troposphere; they act in addition to aerosols, land albedo changes, volcanoes, solar changes, and internal variability. As such, examination of the relationship of shorter intervals (e.g., five to 10 years) can provide limited insight, and drawing conclusions from short time-scales is of limited value. Directly comparing global GHG emissions with global temperatures on decadal or shorter time-scales must consider all plausible variations and other existing non-linear inter-relationships. Both the IPCC and the TSD note that “difficulties remain in attributing temperature changes on smaller than continental scales and over time scales of less than 50 years,” and that with limited exceptions attribution at these scales has not yet been established. Hegerl et al. (2007) state:

Averaging over smaller regions reduces the natural variability less than does averaging over large regions, making it more difficult to distinguish between changes expected from different external forcings, or between external forcing and variability. In addition, temperature changes associated with some modes of variability are poorly simulated by models in some regions and seasons. Furthermore, the small-scale details of external forcing, and the response simulated by models are less credible than large-scale features.

From a recent study cited by the USGCRP, it is true (for some datasets) if a linear trend is fitted to annual global surface temperature data for the period 1998 to 2008, there is no real trend, even though temperatures remain well above the long-term average (Easterling and Wehner, 2009). Climate over the 21st century can and likely will produce periods of a decade or two where the globally averaged surface air temperature shows no trend or even slight cooling in the presence of longer-term warming. We note there are other 10-year periods in the temperature record that when extracted show no trend even though these periods are embedded within a longer period showing substantial overall warming (Easterling and Wehner, 2009). Therefore, it is clear that temperatures do not rise monotonically despite the continuing increase of GHG concentrations. Observations over such short periods examined in isolation may be misleading in the interpretation of the longer-term trend in temperatures.

Over longer time periods and larger geographic scales, the attribution of recent change in part to CO₂ and other GHGs is clear. See Hegerl et al. (2007) and Karl et al. (2009) and the summaries of those two assessment reports in Section 5 of the TSD for discussions of the specific observed changes that have been attributed to increased GHG concentrations, and the evidence for and confidence in those attributions.

Therefore, we disagree with the commenters’ assertion that there is not a cause-and-effect relationship between GHG concentrations and global temperature trends.

Comment (3-5):

Several commenters (e.g., 0169, 3432.1) argue that because the observed warming has occurred in Northern Hemisphere and not the Southern Hemisphere, the warming is not global and inconsistent with anthropogenic attribution.

observation-based studies agree with models. The product of “Evidence” and “Consensus” factors give the LOSU rank. These ranks are high, medium, medium-low, low or very low. Ranks of very low are not evaluated.

Similarly, Forster et al. discusses in detail the rationale for summing multiple forcings together to develop a probability density function for a net effect of all forcings. The discussion notes that the procedure used followed the example of Boucher and Haywood (2001), giving individual RF mechanisms equal weighting “even though the level of scientific understanding differs between forcing mechanisms,” along with several other issues that would introduce further uncertainties. However, the IPCC states (and EPA concurs) that “Despite these caveats ... it remains extremely likely that the combined anthropogenic RF is both positive and substantial” (Forster et al., 2007).

3.2 Alternative Explanations of Observed Changes

Comment (3-23):

A very large number of commenters (e.g., 0230, 0245, 0315, 0368, 0400, 0435, 0521, 0630, 0639.1, 0657, 0659, 0700.1, 0716.1, 1217.1, 1309.1, 1309.1, 1468, 1519, 1544, 1613.1, 1924, 2888.1, 2929, 2992, 3136.1, 3160, 3160.1, 3205.1, 3281.1, 3281.1, 3440.1, 3446.1, 3446.2, 3535.1, 3535.2, 3596.3, 3602.1, 3627.2, 3707.1, 3722, 3722, 3722R13, 3722R24, 3722R49, 3722R51, 3722R55, 3722R85, 3729.1, 3769.1, 4003, 4206, 4244, 4395, 4632R22, 4632R48, 6712, 7025, 7026, 7037) argue that natural factors provide a sufficient explanation for most or all recent climate change. These commenters state that natural processes either are or could be the primary driver of the observed changes in climate discussed in the Proposed Findings and the April TSD, and they posit specific alternative drivers other than anthropogenic GHG emissions. Some commenters focus solely on natural external forcings (e.g., solar output), others solely on natural modes of internal variability (e.g., the El Niño-Southern Oscillation [ENSO]), and some suggest that climate change could be the result of interactions between the two.

Response (3-23):

The claim that natural internal variability or known natural external forcings can explain most (more than half) of the observed global warming of the past 50 years is inconsistent with the assessment literature and the vast body of science it represents. Based on analyses of widespread temperature increases throughout the climate system and changes in other climate variables, the IPCC has reached the following conclusions about external climate forcing: “It is *extremely unlikely* (<5%) that the global pattern of warming during the past half century can be explained without external forcing, and *very unlikely* that it is due to known natural external causes alone” (Hegerl et al., 2007). With respect to internal variability, the IPCC reports the following: “The simultaneous increase in energy content of all the major components of the climate system as well as the magnitude and pattern of warming within and across the different components supports the conclusion that the cause of the [20th century] warming is *extremely unlikely* (<5%) to be the result of internal processes” (Hegerl et al., 2007). As noted in the TSD, the observed warming can only be reproduced with models that contain both natural and anthropogenic forcings (IPCC, 2007d), and the warming of the past half century has taken place at a time when known natural forcing factors alone (solar activity and volcanoes) would likely have produced cooling, not warming (Hegerl et al., 2007). See also other responses in this volume for EPA’s responses to comments on specific alternative warming mechanisms.

The TSD appropriately summarizes this information by stating that empirical associations have been reported between solar-modulated cosmic ray ionization of the atmosphere and global average low-level cloud cover, but evidence for a systematic indirect solar effect remains ambiguous, and by noting that the lack of a proven physical mechanism and the plausibility of other causal factors make the association between galactic cosmic ray-induced changes in aerosol and cloud formation controversial (Forster et al., 2007). For our responses to additional comments on cosmic rays, see response 3-36.

Thus, the TSD comprehensively reviews the topic of solar activity and its effects on climate and its summary of the current state of the science as reflected in the underlying assessment literature is accurate and sound.

Comment (3-25):

Some commenters (3136.1, 3411.2, 3627.2, 3729.1, 4003, 4632R31) argue that modes of interannual variation in oceanic temperature and circulation such as the Pacific Decadal Oscillation (PDO), the El Niño-Southern Oscillation (ENSO), and the Atlantic Multidecadal Oscillation (AMO) could be the proximate cause of most or all recent climate changes. Commenter 3729.1, for example, argues that the oceans “act as the flywheel of the climate system, providing the mechanisms to bring about the changes” and states: “with decadal scale smoothing the ocean multidecadal indices and U.S. temperatures correlate with an r-squared of 0.85.” Commenter 4003 includes with their comment a document authored by Alan Carlin that states the following: “By far the best single explanation for global temperature fluctuations appears to be variations in the PDO/AMO/ENSO.” A document included with comment 3411.2, a chapter by Joseph D’Aleo from the “Supplementary Analysis of the Independent Summary for Policymakers,” published by the Fraser Institute, states: “When you combine the two indices [the PDO and AMO], you can explain much of the temperature variation of the past 110 years in US annual mean temperatures.”

One commenter (4632) submitted a peer-reviewed study (Tsonis et al., 2007) that suggests that synchronous states between four climate indices (PDO, ENSO, the North Atlantic Oscillation, and the North Pacific Oscillation) grow in strength and then abruptly shift to a new climate state, and that interactions between these indices could explain much of the recent climate change. Commenter 3722 also submitted a peer-reviewed study pertinent to the relative influence of natural variability: Stott et al., (2001).

Response (3-25):

Claims that ENSO, PDO, AMO, and other known modes of internal climate variability can explain all or most of the changes in climate that have occurred over the past century are inconsistent with the assessment literature, and commenters did not provide compelling evidence that the assessment literature has reached fundamentally flawed conclusions.

Although ENSO and other teleconnections (a fixed spatial pattern with an associated index time series showing the evolution of its amplitude and change) influence climate over interannual and multi-decadal time scales, and fluctuations in these phenomena can account for much of the interannual variability in the circulation and surface climate (as supported by the assessment literature), these phenomena cannot, by themselves, explain most of the changes in climate that have occurred over the past half-century, including in particular the long-term warming trend clearly evident in the temperature record, as claimed by some commenters.

Karl et al. (2006) note that while changes arising from internally generated variations in the atmosphere-ocean-land-ice/snow climate system, such as equatorial sea-surface temperatures associated with ENSO, can influence surface and atmospheric temperature substantially, climate models indicate that global-

mean unforced variations on multidecadal timescales are likely to be smaller than the 20th century global-mean increase in surface temperature. In addition, the IPCC reports that global mean and hemispheric-scale temperatures on multi-decadal are largely controlled by external forcing, noting that “many observed changes in surface and free atmospheric temperature, ocean temperature and sea ice extent, and some large-scale changes in the atmospheric circulation over the 20th century are distinct from internal variability and consistent with the expected response to anthropogenic forcing” (Hegerl et al., 2007).

With respect to projections of future change in relation to natural variability, the TSD (April 2009 and final) notes that some of the most challenging aspects of understanding and projecting regional climate changes relate to possible changes in the circulation of the atmosphere and the oceans, and their patterns of variability. However, the TSD also included the IPCC’s conclusions that recent advances in regional-scale modeling lead to higher confidence in projected patterns of warming and other regional-scale features, including changes in wind patterns, precipitation, and some aspects of extremes of ice. The IPCC has reported that changes in natural patterns such as ENSO themselves might be related to climate change (Bindoff et al., 2007) and that the question of whether observed changes in ENSO behavior are physically linked to global climate change is “a research question of great importance” (Trenberth et al., 2007).

We note that commenter 4632 provided a recent peer-reviewed reference paper (Swanson and Tsonis, 2009) of relevance to the interplay between internal variability and external forcing. One of the paper’s main arguments is that climate shifts due to couplings between modes of climate variability have not only played a key role in recent climate change but could lead global mean temperatures to remain near current levels for an extended period of several decades. In light of the magnitude of expected GHG forcing, we find it highly unlikely that temperatures will remain near current levels for decades—and it bears mentioning that Swanson and Tsonis state: “[I]t is purely speculative to presume that the global mean temperature will remain near current levels for an extended period of time.”

It is important to note that Swanson and Tsonis (2009) do not interpret their findings in the same way the commenters have. In fact, they say:

“Finally, it is vital to note that there is no comfort to be gained by having a climate with a significant degree of internal variability, even if it results in a near-term cessation of global warming. It is straightforward to argue that a climate with significant internal variability is a climate that is very sensitive to applied anthropogenic radiative anomalies [cf. Roe, 2009]. If the role of internal variability in the climate system is as large as this analysis would seem to suggest, warming over the 21st century may well be larger than that predicted by the current generation of models, given the propensity of these models to underestimate climate internal variability [Kravtsov and Spannagle, 2008].”

Thus, the conclusion they derive is that their findings could imply more, not less, severe climate effects in the future.

Tsonis et al., (2007) do not discuss the relative role of anthropogenic warming in as direct a manner as Swanson and Tsonis but do state that the climate shift they find was triggered by synchronous states in the PDO, ENSO, the North Atlantic Oscillation, and the North Pacific Oscillation “may be superimposed on an anthropogenic warming trend.”

The principal conclusion of the Stott et al. (2001) paper submitted by commenter 3722 is highly consistent with the assessment literature conclusions on this topic. The authors state: “All the results presented here support the conclusions of T99 that anthropogenic factors are largely responsible for the warming in near-surface temperature observed since 1945.”

Comment (3-51):

One commenter (3013) mentions Mars and states that even given the lower atmospheric pressure, his calculation shows that it has twice as much CO₂ as Earth, and further claims that the National Aeronautics and Space Administration (NASA) found that the even with this high CO₂ concentration, the atmosphere of Mars does not retain heat.

Response (3-51):

The commenter did not provide any evidence for his claim that NASA has found that the atmosphere of Mars does not retain heat. Mars does have an atmosphere that is mainly carbon dioxide, but because of the low atmospheric pressure, it is only 16 times the quantity of carbon dioxide on Earth. At the same time, it receives less than 45% as much sunlight, so the increased radiative forcing from the CO₂ is not sufficient to make up for the decrease in solar insolation. Thus, the commenter's claim that the atmosphere of Mars does not retain heat is not consistent with the scientific literature.

3.2.4 CO₂ and Past Global Warming Episodes

Comment (3-52):

A large number of commenters (e.g., 0169, 0373.1, 0401, 0455, 0482.1, 0591, 0639.1, 0661, 0664, 0700.1, 0921, 1017.1, 1309.1, 1312, 1519, 1616.1, 1961, 2666, 2759, 2890.1, 2952.1, 2980, 3013, 3497.1, 3596.1, 3679.1, 3722, 3769.1, 3722R87, 4003, 4206, 4632R48, 5858, 6712, 7025, 10197) argue that atmospheric CO₂ concentrations were not the cause of past periods of global warming and are therefore not the cause of the current period of warming.

Numerous commenters (e.g., 0153, 0169, 0373.2, 0455, 0482.1, 0525, 0534, 0591, 0639.1, 0661, 0664, 1309.1, 1312, 1519, 2666, 2759, 2890.1, 2952.1, 2980, 3013, 3497.1, 3596.1, 3679.1, 3722, 3769.1, 4003, 3722R87, 4632R48, 9799.1, 10197) similarly state that increased CO₂ concentrations lag temperature change and that atmospheric CO₂ concentrations did not drive past periods of climate change but rather were an effect of temperature increases caused by other mechanisms. A document written by Alan Carlin and provided by commenter 4003, for example, stated: "Logic demands that cause must precede effect. Increases in air temperature drive increases in atmospheric CO₂ concentration, and not vice versa."

One commenter (3596.1) stated, "Studies identify periods of time when CO₂ levels were two to four times higher than the current level (Pagani et al., 2005), and these carbon dioxide spikes followed increases in temperature by hundreds or thousands of years. This contradicts EPA's prime assertion that carbon dioxide and the other specified greenhouse gases drive warming."

Response (3-52):

Although the assessment literature (see, for example, Jansen et al., 2007) indicates that the primary initiator of past periods of warming over at least the past 3 million years was orbital forcing, which refers to changes in the seasonal and latitudinal distribution of incoming solar radiation linked to regular variations in the Earth's orbit around the sun. CO₂ and GHGs were an important amplifier of these past periods of global warming. As stated in Jansen et al., "It is *very likely* that glacial-interglacial CO₂ variations have strongly amplified climate variations, but it is *unlikely* that CO₂ variations have triggered the end of glacial periods. Antarctic temperature started to rise several centuries before atmospheric CO₂ during past glacial terminations." Jansen et al. note that the forcing from GHGs during the last glacial maximum was 2.8 W/m² lower than the preindustrial era, compared to 3.2 W/m² of cooling from reflective ice sheets, and about 1 W/m² of cooling from dust, and 1 W/m² of cooling from vegetation changes. Therefore, GHGs were a significant contributor to the temperature difference between glacial

maxima and interglacials. The reason why CO₂ can be an initiator in present times when it was only an amplifier previously is that previously CO₂ concentrations changed only in response to climatic changes, but in the current period, CO₂ concentrations are changing due to human emissions. CO₂ serves as both a cause and an effect. Therefore, we disagree that CO₂ and other GHGs cannot be the cause of the current period of warming. Indeed, projected concentrations of GHGs may contribute as much forcing by the end of the century as the total difference in forcing between glacial and interglacial periods from all causes combined.

In order to clarify the relationship between GHGs and temperature over geologic time, we have added a text box to Section 5 of the TSD. It states the following in regard to temperature changes over the past million years in relation to CO₂ concentrations:

According to the IPCC (Jansen et al., 2007): "The ice core record indicates that GHGs co-varied with Antarctic temperature over glacial-interglacial time scales, suggesting a close link between natural atmospheric GHG concentrations and temperature." Evidence strongly suggests that the timings of the glacial-interglacial cycles are paced by the variations in the orbit of the earth; however, the large response of the climate system implies a strong amplification of the initial orbital forcing (Jansen et al., 2007). Jansen et al. (2007) conclude: "It is *very likely* that glacial-interglacial CO₂ variations have strongly amplified climate variations, but it *unlikely* that CO₂ variations have triggered the end of glacial periods." Antarctic temperatures started to rise several centuries before atmospheric CO₂ during past glacial terminations. CO₂ (and other GHG) changes over glacial to interglacial transitions therefore contribute to, but do not initiate, the temperature changes seen.

Regarding the reference to Pagani et al. (2005): The abstract of Pagani et al. (2005) states: "Our results demonstrate that pCO₂ ranged between 1000 to 1500 parts per million by volume in the middle to late Eocene, then decreased in several steps during the Oligocene, and reached modern levels by the latest Oligocene. The fall in pCO₂ likely allowed for a critical expansion of ice sheets on Antarctica..." Therefore, Pagani et al. are effectively stating that historically, high levels of CO₂ lead to sufficient warming to prevent Antarctic ice sheets from forming. This contradicts the implication of the commenter that CO₂ cannot drive warming. Neither the underlying assessment literature nor the TSD's summary of that literature concludes that carbon dioxide initiated, for example, the glacial-interglacial cycles, but rather that the science clearly shows that CO₂ served as a positive feedback during that period.

Comment (3-53):

A number of commenters (e.g., 0401, 0921, 1017.1, 2750, 4206) argue that the concentration of CO₂ in the atmosphere and the Earth's temperature are not currently and never have been correlated, and many of these commenters provided graphs in support of that argument. Commenter 0373.2, for example, provided a graph that, according to the commenter, shows that there is "absolutely no correlation between CO₂ concentration in the atmosphere and the Earth's temperature."

Commenter 3596.1 argues that "global temperatures and atmospheric CO₂ concentrations have not been associated over geologic time." The commenter cites a study (Rothman, 2002) that, according to the commenter, shows that for the majority of the last half of a billion years atmospheric CO₂ concentrations have fluctuated between two and four time present value and stated that at this scale there is no correlation between increased CO₂ and increased temperature. The commenter stated that EPA should address the geologic temperature record, which, according to the commenter, seems to suggest that a direct correlation between CO₂ and global temperature may not exist.

Response (3-53):

We firmly disagree that atmospheric CO₂ concentrations and the Earth's temperature do not show correlations. The extensive evidence supporting our conclusion that recent (1950 to present) CO₂ concentrations are causally linked to the observed temperature record is discussed in Section 3.1 of this volume of our Response to Comment document. EPA's responses addressing the correlation between CO₂ and temperature over geologic time are addressed in the response 3-52.

We note that several commenters provided graphs they claimed show that CO₂ and temperature were never correlated in the distant past. The origins of these graphs were generally unclear and no underlying data were provided. This issue has been extensively addressed in the assessment literature, and the commenters have not made a compelling case that atmospheric CO₂ concentrations do not affect the Earth's temperature. The provided reference of Rothman (2002) is not consistent with the reconstructions in the assessment literature that are based on multiple independent proxies. Royer et al. (2004) assessed Rothman's methodology and found that the proxy method used by Rothman did not properly account for interactions of the proxy with terrestrial matter from rivers, seawater temperatures, or oxygen concentrations, all of which contribute to the proxy signal.

Comment (3-54):

Several commenters (e.g., 0339, 3440.1, 7026) note that CO₂ concentrations in the distant past have at times been much higher than at present. Commenter 0639.1, for example, stated: "There have been ice ages when carbon dioxide content has been high in the thousands of part per million." Commenter 0661 stated that the current concentration of CO₂ is "dwarfed by not only peaks, but by long term concentrations as high as 7000 ppm, which did not cause an end to the Earth".

One commenter (0541) notes that CO₂ was high during previous a ice age (the late Ordovician) and that therefore it cannot lead to warming; another commenter (3440.1) said that CO₂ was high during the Cambrian and Triassic when calcite and aragonite corals formed and therefore corals can survive acidification; and another (0639.1) asked if raising CO₂ by 100 ppm caused 1 degree warming, why 5000 ppm concentrations in the past didn't cause 40 degrees of warming and kill everything. Commenter 2914 argued that higher CO₂ levels existed in the past and the Earth has survived dramatic changes in atmospheric composition such as the Precambrian appearance of oxygen, demonstrating that it is unlikely that the world will end.

One commenter (11454.1) provides a quote from Heaven & Earth (Plimer, 2009) on historical CO₂ concentrations: "The current CO₂ content of the atmosphere is the lowest it has been for thousands of millions of years and life (including human life) has thrived at times when CO₂ has been significantly higher." Another commenter (3394.1) objected that the statement that CO₂ concentrations exceed the natural range for the past 650,000 years is not supported by the cited Chapter 2 of Working Group 1.

Response (3-54):

Although GHG concentrations in the distant past have substantially exceeded current levels, the existence of high GHG concentrations in the very distant past does not demonstrate that there are not negative consequences of high concentrations in the present, as addressed in the assessment literature. First, the current atmospheric concentrations of CO₂ and CH₄ very likely exceed by far the natural range of at least the last 650,000 years (Jansen et al., 2009), and at least 800,000 years for CO₂ specifically (Karl et al., 2009) (see responses on historical CO₂ concentrations in Volume 2) meaning that concentrations as high as the present may not have existed during the time in which anatomically modern humans have existed (in contrast to the quote from Plimer, for which no evidence was provided). Second, as a consequence of these elevated concentrations, the combined rate of increase in positive radiative forcing due to CO₂, CH₄, and N₂O is very likely unprecedented in at least the past 16,000 years (Jansen et al., 2007). Third, as

EXHIBIT 12

Hugh G. Gauch, Jr., *Scientific
Method in Practice* (excerpts)

SCIENTIFIC METHOD IN PRACTICE

Hugh G. Gauch, Jr.

Cornell University



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This book
to a wise
my dear C
Jonathan

ambiguous words or phrases interpreted differently in its premises and conclusion: A plane is a carpenter's tool; a Boeing 747 is a plane; so a Boeing 747 is a carpenter's tool (Davis 1986:58). The fallacy of amphiboly involves a confusing statement with multiple meanings due to faulty grammar or punctuation: "On campus last night, Professor Merkin gave a factual report on students' sexual activity in the library; therefore we may assume that not all student activity in the library is intellectual in nature" (Parry and Hacker 1991:427).

(4) False Dilemmas. A false dilemma mentions fewer alternatives than actually exist, often only two (Hurley 1994:157–158). In the false dilemma "A or else B; not A; therefore B," the logical form is valid, but the first premise "A or else B" is false because, in a particular case, there exist additional alternatives, such as "C," "D," "A and B," or "C or B." For example, "Either apply nitrogen fertilizer or get yellowish plants" is a false dilemma for many reasons, including the possibilities that a particular soil already has adequate nitrogen without adding fertilizer, or that a virus causes yellowish plants despite adequate fertilizer.

A dishonest variant on the false dilemma is the straw-man argument (Cederblom and Paulsen 1986:104–105). The logical form is "A or else B; not A; therefore B," where A represents an opponent's position and B our own position. The premise "not A" is supported, however, by attacking the opponent's weakest evidence or a simplistic, straw-man representation of the opponent's reasons. If we are honestly trying to test our own position B, then the opponent's position A must be represented by its strongest case. Only if A fails at its best is the premise "not A" established with honesty and strength. Indeed, when you see persons attack a straw man, you do well to suspect that they feared to tackle the real man.

A subtle variant on the false dilemma is the argument from ignorance (*argumentum ad ignorantiam*) (Parry and Hacker 1991:477–479). This fallacy attempts to drive opponents to accept my argument unless they can find a better argument to the contrary. For example, an environmentalist might say "We cannot prove that this pesticide is safe, so we must assume that it is dangerous and outlaw its use." There may or may not be some other good arguments against this pesticide's use, but an argument from ignorance is not a good reason. Similarly, scientists sometimes confuse failure to reject a hypothesis with proof of a hypothesis. The implicit dilemma in an appeal to ignorance is "Give me a better argument or else accept my argument," but the unmentioned third option is to admit current inability to construct a better argument while still either rejecting the offered argument or suspending judgment.

On balance, however, ignorance can provide a legitimate basis for rational actions. For example, precisely because I am ignorant about whether or not

I will be in a car accident tomorrow, it is rational for me to buy car insurance today. Known possibilities as well as known certainties can motivate actions.

Of course, the opposite problem of false dilemmas, namely, believing that we have more choices at our disposal than reality actually offers, is equally common if not even more common. Some dilemmas are false, but others are real! Discerning which dilemmas are false and which are real is vital for logical, realistic thinking.

(5) Circular Reasoning. A circular argument, also called "begging the question," assumes what it intends to prove, amounting to arguing " $p; \therefore p$." Of course, presented that obviously, anyone would reject such stupid reasoning. But by lengthening the argument before closing the circle, and by saying the same thing in different words, circular reasoning can look plausible. So " $p; \therefore p$ " will not convince, but " $q \vee r; s; t \rightarrow (s \vee p); p; \sim r \vee s; u \equiv r; \therefore p$ " might. Likewise, "Whatever is less dense than water will float, because whatever is less dense than water will float" sounds stupid, but "Whatever is less dense than water will float, because such objects won't sink in water" might pass (Cederblom and Paulsen 1986:109). Anyone lacking imagination regarding how to dress up circular reasoning in 101 ways may sit at Aristotle's feet (Parry and Hacker 1991:443-457). Circular reasoning ranks among the most common logical blunders. As always, logical blunders are most enticing to listeners who already like and believe the conclusion.

(6) Genetic Fallacies. A genetic fallacy, also called an *ad hominem* argument (meaning literally "to the man"), attacks one's opponent rather than debating the issue (Hurley 1994:120-123). For example, a scientist might seek to discredit a research report by saying that the researcher is at a small college, rather than refuting the report's data or logic. An *ad hominem* attack is irrational because an argument's merit depends on its content, not on who says it. The *ad hominem* fallacy appeals to prejudices rather than reasons. The intent is to discredit an argument or conclusion by discrediting its proponent.

Imagine that we are third parties to a scientific dispute between Jones and Smith. Jones stoops to an attack saying that Smith's grandmother smokes cigars. How should we react to this? Well, if this is the worst that Jones can find against Smith, we may interpret this irrelevant attack as presumptive evidence that Smith's scientific theory has something going for it! Smith's theory may well merit an honest hearing and careful evaluation. In such a case, it may be unwise to rely on Jones's account of Smith's theory, but rather Smith's own report should be studied.

On balance, however, some situations justify inspecting a scientist's training and motivations, so it could be wrong to forego such an inspection automatically on the grounds that it would constitute an *ad hominem* attack. Particularly when a scientist's conclusion is uncertain or false, personal factors can be relevant. For example, an explanation for someone believing

EXHIBIT 13

**CRR, et al., Comments on
EPA's Proposed
Endangerment Finding
(June 22, 2009) (excerpts)**

HOLLAND & HART



Paul D. Phillips
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June 22, 2009

VIA OVERNIGHT MAIL & HAND DELIVERY

U.S. Environmental Protection Agency
EPA Docket Center (EPA/DC), Mailcode 6102T
Attn: Docket ID No. EPA-HQ-OAR-2009-0171
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Re: Coalition Comments on EPA's Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases, 74 Fed. Reg. 18886-18910 (April 24, 2009): Docket ID No. EPA-HQ-OAR-2009-0171

Dear Sir/Madam:

These Comments are being filed by Holland & Hart on behalf of a Coalition of companies and trade associations involved in energy, mining, and beef production in the Western United States, consisting of Great Northern Project Development, L.P., Questar Corporation, Solvay Chemicals, Inc., Ballard Petroleum Holdings, LLC, General Chemical, FMC Corporation, OCI Chemical Corporation, Searles Valley Minerals Operations Inc., the Industrial Minerals Association – North America (IMA-NA), and the National Cattlemen's Beef Association (NCBA) (collectively, the Coalition), on EPA's proposed Endangerment and Cause or Contribute Findings, 74 Fed. Reg. 18886-18901 (April 24, 2009).

These Comments include Exhibit 1, Biographies of Principal Scientists Cited in Coalition Comments; and Exhibit 2, References and Additional Sources Incorporated by Reference into Coalition Comments. All of the studies, books, publications, and other documents cited in the Comments are readily available, and are hereby incorporated in their entirety into these Comments. We are submitting with the overnight mail set of the Comments a CD containing all of the references cited (except those in the form of published books); and hand-delivering to the EPA Docket Center a separate full set of the Comments, Exhibits, and hard copies of all documents cited, including published books, organized in tabbed binders corresponding to the list of References in Exhibit 2.

Sincerely yours,

Paul D. Phillips
Robert T. Connery
James A. Holtkamp
of Holland & Hart LLP

PDP:dc
Enclosures
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**BEFORE THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY**

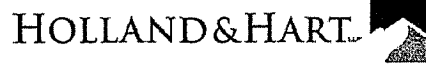
**IN THE MATTER OF EPA'S PROPOSED FINDING OF ENDANGERMENT
FROM ANTHROPOGENIC GREENHOUSE GASES
TO PUBLIC HEALTH AND WELFARE
74 FED. REG. 18886-18910 (APRIL 24, 2009)**

COALITION COMMENTS ON EPA'S PROPOSED)	
ENDANGERMENT FINDING FOR)	DOCKET NO.
ANTHROPOGENIC GREENHOUSE GASES)	EPA-HQ-OAR-2009-0171
UNDER § 202(a) OF THE CLEAN AIR ACT)	

**PREPARED ON BEHALF OF THE COALITION
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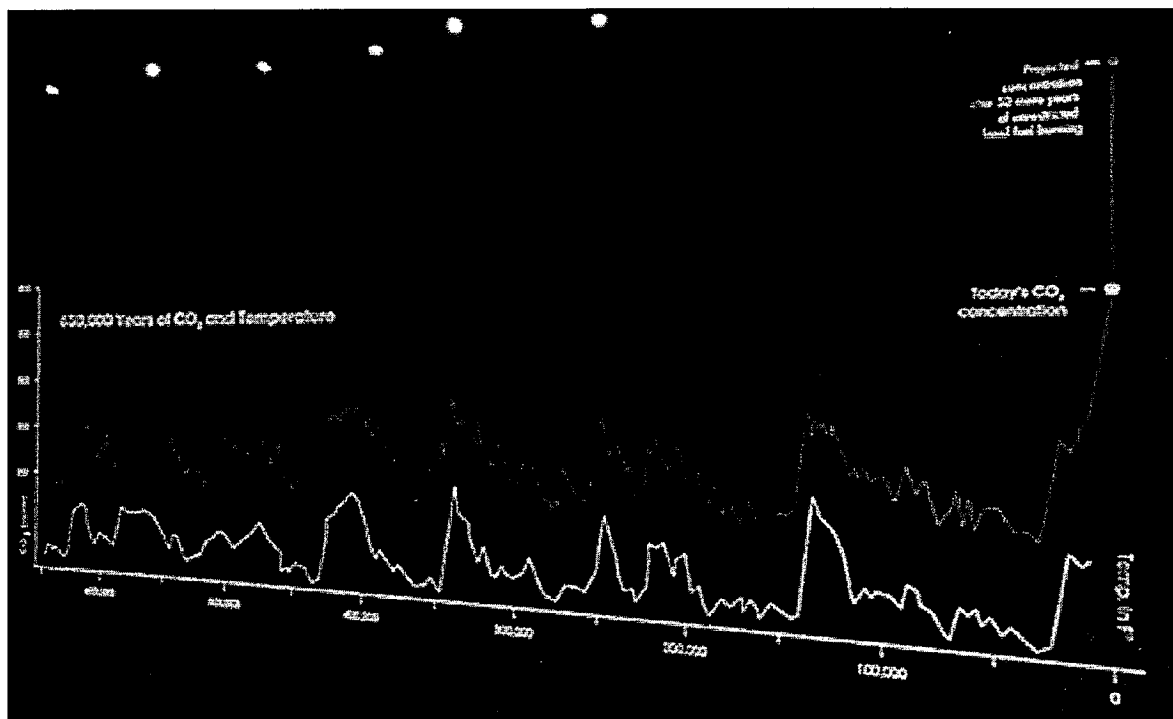
DATED: JUNE 23, 2009



C. CO₂ Concentrations Do Not Correlate Causatively With Temperature Records.

The work of Dr. Akasofu on natural variability discussed above is one example of the lack of correlation between CO₂ and global warming, especially in the Arctic. As Professor Philander notes: “in contrast to the steady rise in the atmospheric concentrations of carbon dioxide [from approximately 315ppm in 1960 to approximately 360ppm in 1990] . . . temperatures have fluctuated erratically.” (Philander 1998: 200).

Figure 4



(*An Inconvenient Truth* 2006). Figure 4 shows the graph put forth by former Vice-President Al Gore in his film "*An Inconvenient Truth*" to demonstrate that CO₂ and temperature rise and fall together. The title of the graph in light blue text at the top left reads: "650,000 Years of CO₂ and Temperatures." The bottom blue line is "Temp in F°" labeled at the bottom right, while the top red line shows CO₂ concentrations. The top yellow dot on the red line at the right of the graph is labeled "Projected concentration after 50 more years of unrestricted fossil fuel burning," while the middle yellow dot on the red line reads: "Today's CO₂ concentration." As discussed below, when viewed at high resolution (i.e. enlarged and "decompressed") the graph shows that CO₂ concentration "lags behind the temperature by typically several hundred to a thousand years," rather than preceding the temperature change. (Solomon 2008: 95).

The hypothesis that human-caused GHGs are responsible for dangerous global warming rests almost entirely on establishing a causative correlation between CO₂, to which EPA attributes 94% of greenhouse gas emissions (74 Fed. Reg. 18908), and dangerous warming. Perhaps the most famous invocation of this "correlation" to support the causative role of CO₂ is in Al Gore's film *An Inconvenient Truth*, which famously displays a graphic that purports to demonstrate the cause and effect relationship between CO₂ concentrations in the atmosphere and resulting temperature changes over the last 650,000 years. (*An Inconvenient Truth* 2006). Vice-President Gore is not alone. The IPCC states "Most of the observed increase in global average temperatures since the mid-20th century is **very likely** [i.e., a 90-99% probability of occurrence according to the IPCC] due to the observed increase in anthropogenic greenhouse gas concentrations." (IPCC 2007(c): 10).



Do these assertions of CO₂ “causation or contribution” withstand scientific scrutiny? Professor Shaviv is an Israeli astrophysicist, whose work has contributed to the understanding that the solar system is not stationary, but moves through our galaxy encountering large variations in cosmic flux. Here is what Professor Shaviv has to say:

[T]his graph [Figure 4 in these Comments] doesn't prove at all that CO₂ has any effect on the global temperature. All it says is that there is some equilibrium between dissolved CO₂ and atmospheric CO₂, an equilibrium that depends on the temperature. Of course, the temperature itself can depend on a dozen different factors, including CO₂, but **just the CO₂/temperature correlation by itself doesn't tell you the strength of the CO₂ → ΔT [change in temperature] link. It doesn't even tell you the sign.**

Think for example on a closed Coke bottle. It has coke [sic] with dissolved CO₂ and it has air with gaseous CO₂. Just like Earth, most of the CO₂ is in the dissolved form. If you warm the coke bottle, the coke cannot hold as much CO₂, so it releases a little and increases the partial pressure of the gaseous CO₂, enough to force the rest of the dissolved CO₂ to stay dissolved. Since there is much more dissolved CO₂ than gaseous CO₂, the amount released from the coke is relatively small.

Of course, the comparison can go only so far. The mechanisms governing CO₂ in the oceans are much more complicated such that: the equilibrium depends on the amount of biological activity, on the complicated chemical reactions in the oceans, and many more interactions I am probably not aware of. . . The bottom line is that the equilibrium is quite complicated to calculate. . . .

The main evidence proving that CO₂ does not control the climate, but at most can play a second fiddle by just amplifying the variations already present, is the lags. **In all cases where there is a good enough resolution, one finds that the CO₂ lags behind the temperature by typically several hundred to a thousand years. Namely, the basic climate driver that controls the temperature cannot be that of CO₂. That driver, whatever it is, affects the climate equilibrium, and the temperature changes accordingly. Once the oceans adjust (on a time scale of decades to centuries), the CO₂ equilibrium changes as well. The changed CO₂ can further affect the temperature, *but the CO₂/temperature correlation cannot be used to say almost anything about the strength of this link.***

(Shaviv 2007, available at <http://www.sciencebits.com/icecoretruth>) (emphasis added).

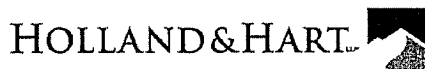
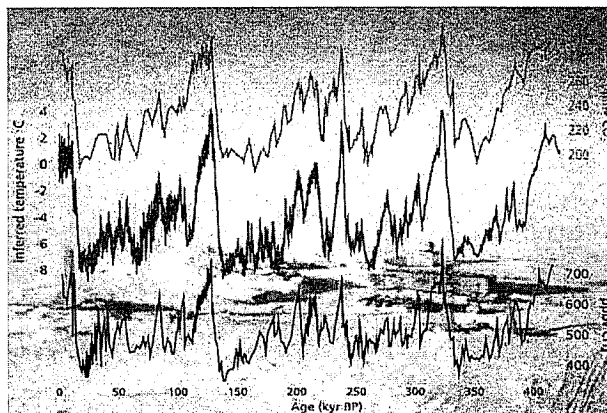


Figure 5

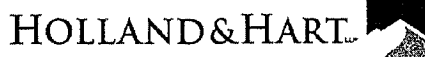


Atmospheric carbon dioxide, temperature and methane levels for the last 420,000 years as reconstructed from the Vostok ice core, Antarctica (after Petit et al. 1999). Note the remarkable coincidence of timing of variations in atmospheric temperature (middle curve) and the two greenhouse gases. In terms of cause and effect, however, it is apparent at higher resolution that the changes in temperature precede the changes in carbon dioxide by about 800 years (e.g. Mudelsee, 2001). (Carter 2007: 63).

Figure 5 above is a graph similar to that of former Vice-President Gore's, covering a 420,000 year period of time, showing two greenhouse gases (CO₂ and methane (CH₄)), along with temperature change over that period. As noted in the caption: "it is apparent at higher resolution that the changes in temperature *precede* the changes in carbon dioxide by about 800 years (e.g. Mudelsee, 2001)." (Carter 2007: 63). An example displaying the data on a shorter time scale is shown in Figure 1 of these Comments.

As noted in the caption to Figure 1 of these Comments, there is "a lack of correspondence," between the greenhouse gases and temperature change at this scale, consonant with Dr. Akasofu's demonstration described above in Section II.B.1. Thus, correlation is lacking in both long and short scales, with the only consistent lag structure being that referred to by Dr. Carter and Dr. Shaviv; namely, the several hundred years between temperature peaks that **precede** CO₂ peaks. The larger uncertainty with respect to CO₂ and temperature change is covered in Section II.D.1. below, which demonstrates that it is possible to manipulate the data to show warming or cooling simply by picking different end-points in time.

In layman's language, Drs. Shaviv and Carter are observing that Al Gore's now famous graph compresses hundreds of thousands of years into such a small space that they do not show whether the CO₂ increases occur before or after the temperature increases. When the graphs are examined closely at higher resolution; i.e., magnified to the point where they show whether the CO₂ increase precedes or follows the temperature increase, they illustrate that the temperature increases generally **precede** the CO₂ increases by about 800 years (Carter 2007) or, as Dr. Shaviv states: "one finds that the CO₂ lags behind the temperature by typically several hundred to a thousand years." (Shaviv 2007).



Thus, Gore's most fundamental conclusion, that CO₂ drives temperatures, is not supported by the evidence in the graph itself. It is not only "profoundly uncertain," it is also a misrepresentation of the underlying data, and contrary to the scientific analyses of Drs. Carter and Shaviv.

The work of Dr. Akasofu on natural variability discussed above is a very dramatic example of the lack of causative correlation between CO₂ and warming, especially in the Arctic. Dr. Akasofu has spoken directly on the significance of the lack of causation (shown dramatically in Figure 1 of these Comments). Commenting on the lack of causation between the dramatic Arctic temperature changes and CO₂, Dr. Akasofu stated:

Once we 'take seriously' the Arctic data, then the very dramatic rise in temperature (more than 1.6 degrees) from 1920 to 1940, and the subsequent almost equally drastic fall in temperature from 1940 to the mid-1970s, causes serious problems for the CO₂ thesis.

(Solomon 2008: 76-77, citing telephone and email exchanges with Dr. Akasofu). As demonstrated above, Dr. Akasofu noted that the increase in Arctic temperatures from 1975 to 1998 is less than the increase in Arctic temperature observed between 1920 to 1940, and therefore within "natural variation" in the Arctic for this period. Dr. Akasofu continues:

Thus, the large fluctuation between 1920 and 1975 can be considered to be a natural change. . . . Contrary to the statement by the UN's Intergovernmental Panel on Climate Change in its 2007 Report, it is not possible to say with any confidence that the rise after 1975 is mostly caused by the greenhouse effect.

(Solomon 2008: 78, citing telephone and email exchanges with Dr. Akasofu). The IPCC's assertions that CO₂ concentration and "average global temperature" are causatively correlated during the twentieth century, primarily and likely due to humans, is simply contrary to the weight of scientific evidence. EPA has not examined or weighed this compelling scientific evidence.

D. Scientific Evidence, Including Information Not Addressed by EPA, Shows That the Earth Might Be Warming or Cooling.

1. Detailed Review of the Earth's Temperature Record Shows That Whether The Earth is Warming or Cooling Depends Entirely on The Period Chosen, Creating Profound Scientific Uncertainty.

For any temperature dataset, the answer to the question, "Is global temperature rising or falling?" depends on the chosen time interval under consideration.

EXHIBIT 14

IPCC 4th Assessment Report, Chapter 1 (excerpts)

1

Historical Overview of Climate Change Science

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This chapter should be cited as:

Le Treut, H., R. Somerville, U. Cubasch, Y. Ding, C. Mauritzen, A. Mokssit, T. Peterson and M. Prather, 2007: Historical Overview of Climate Change. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Frequently Asked Question 1.1

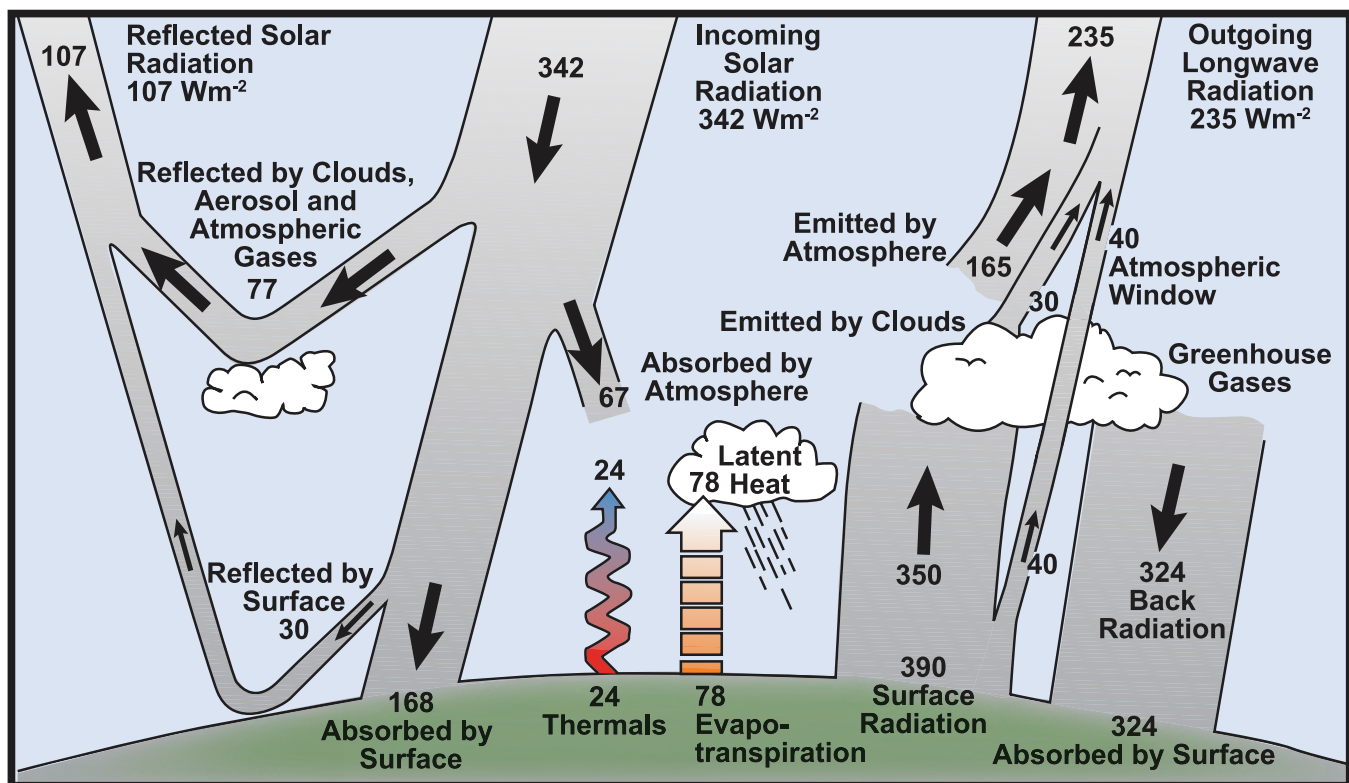
What Factors Determine Earth's Climate?

The climate system is a complex, interactive system consisting of the atmosphere, land surface, snow and ice, oceans and other bodies of water, and living things. The atmospheric component of the climate system most obviously characterises climate; climate is often defined as 'average weather'. Climate is usually described in terms of the mean and variability of temperature, precipitation and wind over a period of time, ranging from months to millions of years (the classical period is 30 years). The climate system evolves in time under the influence of its own internal dynamics and due to changes in external factors that affect climate (called 'forcings'). External forcings include natural phenomena such as volcanic eruptions and solar variations, as well as human-induced changes in atmospheric composition. Solar radiation powers the climate system. There are three fundamental ways to change the radiation balance of the Earth: 1) by changing the incoming solar radiation (e.g., by changes in Earth's orbit or in the Sun itself); 2) by changing the fraction of solar radiation that is reflected (called

'albedo'; e.g., by changes in cloud cover, atmospheric particles or vegetation); and 3) by altering the longwave radiation from Earth back towards space (e.g., by changing greenhouse gas concentrations). Climate, in turn, responds directly to such changes, as well as indirectly, through a variety of feedback mechanisms.

The amount of energy reaching the top of Earth's atmosphere each second on a surface area of one square metre facing the Sun during daytime is about 1,370 Watts, and the amount of energy per square metre per second averaged over the entire planet is one-quarter of this (see Figure 1). About 30% of the sunlight that reaches the top of the atmosphere is reflected back to space. Roughly two-thirds of this reflectivity is due to clouds and small particles in the atmosphere known as 'aerosols'. Light-coloured areas of Earth's surface – mainly snow, ice and deserts – reflect the remaining one-third of the sunlight. The most dramatic change in aerosol-produced reflectivity comes when major volcanic eruptions eject material very high into the atmosphere. Rain typically

(continued)



FAQ 1.1, Figure 1. Estimate of the Earth's annual and global mean energy balance. Over the long term, the amount of incoming solar radiation absorbed by the Earth and atmosphere is balanced by the Earth and atmosphere releasing the same amount of outgoing longwave radiation. About half of the incoming solar radiation is absorbed by the Earth's surface. This energy is transferred to the atmosphere by warming the air in contact with the surface (thermals), by evapotranspiration and by longwave radiation that is absorbed by clouds and greenhouse gases. The atmosphere in turn radiates longwave energy back to Earth as well as out to space. Source: Kiehl and Trenberth (1997).

clears aerosols out of the atmosphere in a week or two, but when material from a violent volcanic eruption is projected far above the highest cloud, these aerosols typically influence the climate for about a year or two before falling into the troposphere and being carried to the surface by precipitation. Major volcanic eruptions can thus cause a drop in mean global surface temperature of about half a degree celsius that can last for months or even years. Some man-made aerosols also significantly reflect sunlight.

The energy that is not reflected back to space is absorbed by the Earth's surface and atmosphere. This amount is approximately 240 Watts per square metre (W m^{-2}). To balance the incoming energy, the Earth itself must radiate, on average, the same amount of energy back to space. The Earth does this by emitting outgoing longwave radiation. Everything on Earth emits longwave radiation continuously. That is the heat energy one feels radiating out from a fire; the warmer an object, the more heat energy it radiates. To emit 240 W m^{-2} , a surface would have to have a temperature of around -19°C . This is much colder than the conditions that actually exist at the Earth's surface (the global mean surface temperature is about 14°C). Instead, the necessary -19°C is found at an altitude about 5 km above the surface.

The reason the Earth's surface is this warm is the presence of greenhouse gases, which act as a partial blanket for the longwave radiation coming from the surface. This blanketing is known as the natural greenhouse effect. The most important greenhouse gases are water vapour and carbon dioxide. The two most abundant constituents of the atmosphere – nitrogen and oxygen – have no such effect. Clouds, on the other hand, do exert a blanketing effect similar to that of the greenhouse gases; however, this effect is offset by their reflectivity, such that on average, clouds tend to have a cooling effect on climate (although locally one can feel the warming effect: cloudy nights tend to remain warmer than clear nights because the clouds radiate longwave energy back down to the surface). Human activities intensify the blanketing effect through the release of greenhouse gases. For instance, the amount of carbon dioxide in the atmosphere has increased by about 35% in the industrial era, and this increase is known to be due to human activities, primarily the combustion of fossil fuels and removal of forests. Thus, humankind has dramatically altered the chemical composition of the global atmosphere with substantial implications for climate.

Because the Earth is a sphere, more solar energy arrives for a given surface area in the tropics than at higher latitudes, where

sunlight strikes the atmosphere at a lower angle. Energy is transported from the equatorial areas to higher latitudes via atmospheric and oceanic circulations, including storm systems. Energy is also required to evaporate water from the sea or land surface, and this energy, called latent heat, is released when water vapour condenses in clouds (see Figure 1). Atmospheric circulation is primarily driven by the release of this latent heat. Atmospheric circulation in turn drives much of the ocean circulation through the action of winds on the surface waters of the ocean, and through changes in the ocean's surface temperature and salinity through precipitation and evaporation.

Due to the rotation of the Earth, the atmospheric circulation patterns tend to be more east-west than north-south. Embedded in the mid-latitude westerly winds are large-scale weather systems that act to transport heat toward the poles. These weather systems are the familiar migrating low- and high-pressure systems and their associated cold and warm fronts. Because of land-ocean temperature contrasts and obstacles such as mountain ranges and ice sheets, the circulation system's planetary-scale atmospheric waves tend to be geographically anchored by continents and mountains although their amplitude can change with time. Because of the wave patterns, a particularly cold winter over North America may be associated with a particularly warm winter elsewhere in the hemisphere. Changes in various aspects of the climate system, such as the size of ice sheets, the type and distribution of vegetation or the temperature of the atmosphere or ocean will influence the large-scale circulation features of the atmosphere and oceans.

There are many feedback mechanisms in the climate system that can either amplify ('positive feedback') or diminish ('negative feedback') the effects of a change in climate forcing. For example, as rising concentrations of greenhouse gases warm Earth's climate, snow and ice begin to melt. This melting reveals darker land and water surfaces that were beneath the snow and ice, and these darker surfaces absorb more of the Sun's heat, causing more warming, which causes more melting, and so on, in a self-reinforcing cycle. This feedback loop, known as the 'ice-albedo feedback', amplifies the initial warming caused by rising levels of greenhouse gases. Detecting, understanding and accurately quantifying climate feedbacks have been the focus of a great deal of research by scientists unravelling the complexities of Earth's climate.

EXHIBIT 15

IPCC 4th Assessment Report, Chapter 2 (excerpts)

2

Changes in Atmospheric Constituents and in Radiative Forcing

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Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: Changes in Atmospheric Constituents and in Radiative Forcing. *In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Table 2.11. Uncertainty assessment of forcing agents discussed in this chapter. Evidence for the forcing is given a grade (A to C), with A implying strong evidence and C insufficient evidence. The degree of consensus among forcing estimates is given a 1, 2 or 3 grade, where grade 1 implies a good deal of consensus and grade 3 implies an insufficient consensus. From these two factors, a level of scientific understanding is determined (LOSU). Uncertainties are in approximate order of importance with first-order uncertainties listed first.

	Evidence	Consensus	LOSU	Certainties	Uncertainties	Basis of RF range
LLGHGs	A	1	High	Past and present concentrations; spectroscopy	Pre-industrial concentrations of some species; vertical profile in stratosphere; spectroscopic strength of minor gases	Uncertainty assessment of measured trends from different observed data sets and differences between radiative transfer models
Stratospheric ozone	A	2	Medium	Measured trends and its vertical profile since 1980; cooling of stratosphere; spectroscopy	Changes prior to 1970; trends near tropopause; effect of recent trends	Range of model results weighted to calculations employing trustworthy observed ozone trend data
Tropospheric ozone	A	2	Medium	Present-day concentration at surface and some knowledge of vertical and spatial structure of concentrations and emissions; spectroscopy	Pre-industrial values and role of changes in lightning; vertical structure of trends near tropopause; aspects of emissions and chemistry	Range of published model results, upper bound increased to account for anthropogenic trend in lightning
Stratospheric water vapour from CH ₄	A	3	Low	Global trends since 1990; CH ₄ contribution to trend; spectroscopy	Global trends prior to 1990; radiative transfer in climate models; CTM models of CH ₄ oxidation	Range based on uncertainties in CH ₄ contribution to trend and published RF estimates
Direct aerosol	A	2 to 3	Medium to Low	Ground-based and satellite observations; some source regions and modelling	Emission sources and their history vertical structure of aerosol, optical properties, mixing and separation from natural background aerosol	Range of published model results with allowances made for comparisons with satellite data
Cloud albedo effect (all aerosols)	B	3	Low	Observed in case studies – e.g., ship tracks; GCMs model an effect	Lack of direct observational evidence of a global forcing	Range of published model results and published results where models have been constrained by satellite data
Surface albedo (land use)	A	2 to 3	Medium to Low	Some quantification of deforestation and desertification	Separation of anthropogenic changes from natural	Based on range of published estimates and published uncertainty analyses
Surface albedo (BC aerosol on snow)	B	3	Low	Estimates of BC aerosol on snow; some model studies suggest link	Separation of anthropogenic changes from natural; mixing of snow and BC aerosol; quantification of RF	Estimates based on a few published model studies
Persistent linear Contrails	A	3	Low	Cirrus radiative and microphysical properties; aviation emissions; contrail coverage in certain regions	Global contrail coverage and optical properties	Best estimate based on recent work and range from published model results

Table 2.11 (continued)

	Evidence	Consensus	LOSU	Certainties	Uncertainties	Basis of RF range
Solar irradiance	B	3	Low	Measurements over last 25 years; proxy indicators of solar activity	Relationship between proxy data and total solar irradiance; indirect ozone effects	Range from available reconstructions of solar irradiance and their qualitative assessment
Volcanic aerosol	A	3	Low	Observed aerosol changes from Mt. Pinatubo and El Chichón; proxy data for past eruptions; radiative effect of volcanic aerosol	Stratospheric aerosol concentrations from pre-1980 eruptions; atmospheric feedbacks	Past reconstructions/estimates of explosive volcanoes and observations of Mt. Pinatubo aerosol
Stratospheric water vapour from causes other than CH ₄ oxidation	C	3	Very Low	Empirical and simple model studies suggest link; spectroscopy	Other causes of water vapour trends poorly understood	Not given
Tropospheric water vapour from irrigation	C	3	Very Low	Process understood; spectroscopy; some regional information	Global injection poorly quantified	Not given
Aviation-induced cirrus	C	3	Very Low	Cirrus radiative and microphysical properties; aviation emissions; contrail coverage in certain regions	Transformation of contrails to cirrus; aviation's effect on cirrus clouds	Not given
Cosmic rays	C	3	Very Low	Some empirical evidence and some observations as well as microphysical models suggest link to clouds	General lack/doubt regarding physical mechanism; dependence on correlation studies	Not given
Other surface effects	C	3	Very Low	Some model studies suggest link and some evidence of relevant processes	Quantification of RF and interpretation of results in forcing feedback context difficult	Not given

EXHIBIT 16

EPA's Response to Comments on the Endangerment Finding, Vol. 4 (excerpts)



Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act:

EPA's Response to Public Comments

Volume 4: Validity of Future Projections

The claims that insufficient model initialization data exists, and that there are no appropriate boundary conditions, are related to the issue of the differences between weather and climate. A climate model usually divides the globe up into a large number of grid cells. Each cell has at any given point in time a temperature, wind direction, precipitation, gas composition, and other characteristics. The model then uses physics routines to determine how the characteristics of these grid cells would change for the next time step in the model (often several minutes of “model time”). The behavior of these grid cells defines the weather in the model—heat waves, storms, etc. Therefore, grid-by-grid data would be very important for near-term weather predictions. Indeed, the limitations of the initialization data (initial boundary conditions) and the resolution of the model are key factors in determining how far into the future a weather model can make accurate forecasts. On the other hand, 100-year climate projections are relatively insensitive to small changes in initial conditions. For purposes of predicting that June will be warmer than December, one does not necessarily need to know the exact atmospheric conditions of every square inch on the planet. For purposes of predicting the climate response (the average weather) to CO₂ concentrations, it is also not necessary to perfectly initialize the model. Indeed, most climate models are “spun-up” from time periods long before the present day, rather than being initialized to match current conditions; this “spin-up” is done to make sure that the model is in a state that is stable and self-consistent, which is more important than whether the model weather on the 5th of June matches the real-world weather on the 5th of June. Therefore, we find that these objections do not weaken the conclusions of the assessment literature as summarized in the TSD.

Comment (4-3):

Many commenters argue that models do not capture a number of important processes. For example, commenters list processes such as clouds, dust, chemistry, and biological systems (0195,0546,3722), “Asian brown cloud” (3330.1), black carbon (3316.1,3596.1), historical albedo changes (0639.1), soil moisture (3596.1), various non-GHG anthropogenic forcings such as land use change and heat islands (3222.1), solar activity (2895), cosmic radiation (0650), and increased evaporation (1606.1) (which the commenter notes has not been seen because of global dimming). One commenter cites Wild (2005b) and Stanhill and Cohen (2009) when stating that “[c]urrent models do not consider the observed solar ‘dimming’ and post-1985 ‘brightening.’” Commenter (3722) states that EPA failed to consider soils and vegetation in the carbon cycle, citing Dyson (1999) as stating that it makes no sense to consider the atmosphere and ocean alone.

One commenter (3316.1) quotes the Scientific Alliance as stating that “it is sobering to note that the last IPCC Assessment Report, published just two years ago, makes no mention of the significant effect of soot.”

Response (4-3):

We have reviewed the assessment literature in light of these comments and the referenced materials, and we conclude that commenters are incorrect. In fact, the models do include the most essential climate-related processes. Many or most models include the effects of black carbon, global dimming, and other aerosol issues (including the atmospheric brown cloud), atmospheric chemistry, biological ecosystem uptake, natural variability on various timescales, land use change and historical albedo changes, and soil moisture and evaporation. These are all addressed in detail by the IPCC (Randall et al., 2007) and CCSP (2008c), which detail many of the newer advances in modeling terrestrial systems, aerosol indirect effects, and other properties. Figure 1.2 of Le Treut et al. (2007) and Figure 1.1 of CCSP (2008c) show graphical depictions of the evolution of climate models, showing that modern models now include chemistry, sulfates, precipitation, volcanic activity, land surface albedo, non-sulfate aerosols, rivers, interactive vegetation, sea ice, the carbon cycle, and overturning ocean circulation. Randall et al. note that carbon cycle dynamics now include soil carbon cycle, and devote a section to soil moisture feedbacks.

Global dimming refers to the reduction of sunlight reaching the surface, in large part due to increased aerosol emissions during the mid to late 20th century. This dimming has consequences for vertical temperature distributions, evaporation, ecosystem growth, and other climatic variables. Dimming in particular was addressed in terms of observational studies by the IPCC in Trenberth et al. (2007). Both submitted references (Wild, 2005b; Stanhill and Cohen, 2009) are also observational studies and are consistent with the IPCC treatment of these observations in that both studies show that dimming has reduced after 1990 (the Wild study was included in Trenberth et al.), though there is disagreement between the two studies in the urban bias of the dimming, with Stanhill and Cohen showing that in Israel the evidence is consistent with a more broad-based dimming. Any model that includes aerosols (which is nearly all of them) also includes the basic physics that lead to “dimming” and “brightening.” There are, however, continued uncertainties about historical and projected aerosol emissions, and those uncertainties are summarized in Section 6 of the TSD.

Clouds are difficult to model computationally because the physics involved in cloud formation occurs at scales smaller than the resolution of most climate models. Therefore, clouds are represented by parameterizations in global climate models rather than being calculated explicitly. Because cloud responses to climatic change are important for both the trapping and reflection of energy, we recognize that clouds contribute to uncertainties in model-based results. For this reason, the TSD summarizes the uncertainties involved in estimating the indirect albedo effect (see Section 4[a]), some regional changes in precipitation (see Section 6[b]), and issues involving cloud representation (see Section 6[b]).

With regards to the IPCC Assessment Report not mentioning soot, we note that soot and black carbon are both addressed at length in Forster et al. (2007). See also the response on black carbon in Volume 3 on commenters attributing recent temperature change to black carbon instead of GHGs.

Historical patterns of solar activity are also included in the models. For EPA’s responses to issues involving the influence of cosmic radiation on climate, please refer to Volume 3 of this Response to Comments document.

Comment (4-4):

One commenter (3769.1) objects to the lack of inclusion in climate models of water vapor dimers, citing Paynter et al. (2007). The commenter states that “their atmospheric absorption of incoming solar radiation in the near infrared ... may lead to a negative climate feedback as WV [water vapor] concentration increases in the lower troposphere.”

Response (4-4):

In response to this comment, we reviewed the literature on water vapor dimers, and we conclude that the explicit inclusion in models of water vapor dimers is not likely to materially change any conclusions from the assessment literature regarding climate feedbacks. Water vapor dimers (WD) are phenomena that occur at high concentrations of water vapor when pairs of water molecules interact in ways that can change their light absorption properties. Therefore, the absorption properties of water in the atmosphere may be dependent on this effect. Some studies suggest that inclusion of this behavior can lead to an increase in atmospheric absorption of sunlight by a couple of percent (Chýlek and Geldart, 1997) compared to a modeled situation without water dimers.

We do not find in the literature (including the referenced paper by Paynter et al., which was a laboratory measurement of the dimer absorption spectra and included no statements about implications for climate feedbacks) any support for the commenter’s assertion that WD are likely to lead to negative climate feedbacks, much less sufficient negative feedback to materially change projections of climate change.

substantially affect the likelihood of extreme temperature, droughts, and short-term precipitation extremes over North America (Gutowski et al., 2008).

Please refer to Volume 3 for EPA's responses to comments on temperature attribution for Alaska in relation to the PDO as well as responses regarding attribution for Antarctic temperature trends, and Volume 2 for EPA's responses to comments on the existing temperature trends in Alaska, the Arctic, and the Antarctic.

Comment (4-16):

A number of commenters (e.g., 0650, 2057, 2890.1, 3291.1, 3679.1, 3722) note that cloud modeling is important for accurate representation of the climate system and precipitation calculations, and yet that it is an area with a lot of uncertainty. Several commenters quote the IPCC—for example, one commenter (3291.1) provides the statement by the IPCC that “[s]ignificant uncertainties, in particular, are associated with the representation of clouds, and in the resulting cloud response to climate change. Consequently, models continue to display a substantial range of global temperature change in response to specified greenhouse gas forcing.”

Response (4-16):

We agree that cloud modeling is important for accurately representing climate system and is subject to significant uncertainties. The TSD summarizes the findings of the assessment literature on this issue and acknowledges the uncertainties, as discussed in the assessment literature, involved in modeling clouds and precipitation. For example, in Section 6(b), the TSD states, following Meehl et al., 2007):

Models have proven to be extremely important tools for simulating and understanding climate, and there is considerable confidence that they are able to provide credible quantitative estimates of future climate change, particularly at larger scales. Models continue to have significant limitations, such as in their representation of clouds, which lead to uncertainties in the magnitude and timing, as well as regional details, of predicted climate change. Nevertheless, over several decades of model development, they have consistently provided a robust and unambiguous picture of significant climate warming in response to increasing greenhouse gases.

The TSD also addresses the confidence and limitations involved in predicting precipitation referencing both IPCC (2007d) and CCSP (2008c). We note that the conclusions in the scientific literature are that the findings are robust despite these uncertainties. A detailed analysis of uncertainties associated with cloud modeling and their relationship to overall model results is found in Randall et al. (2007), among other underlying references for the TSD. Indeed, the statement in Randall et al. (2007) directly after the quote provided by commenter (3291.1) is: “Despite such uncertainties, however, models are unanimous in their prediction of substantial climate warming under greenhouse gas increases, and this warming is of a magnitude consistent with independent estimates derived from other sources, such as from observed climate changes and past climate reconstructions.”

Comment (4-17):

A number of commenters (e.g., 0400, 0499, 3215.1, 3340, 3596.1,) object to positive feedbacks in climate models. One commenter (0400) states that there has been no runaway climate change in the past despite large changes in CO₂ and claims therefore that there must be strong negative feedbacks in the system. A

Ocean, north of 20°N. During a “warm,” or “positive,” phase, the west Pacific becomes cool and part of the eastern ocean warms; during a “cool,” or “negative,” phase, the opposite pattern occurs.

EXHIBIT 18

EPA Technical Support Document for Endangerment Finding (excerpts)

Technical Support Document for

Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act

December 7, 2009



Climate Change Division, Office of Atmospheric Programs
U.S. Environmental Protection Agency
Washington, DC

2(c) Historic and Current Global Greenhouse Gas Concentrations

Greenhouse gas concentrations in the atmosphere vary over very long time scales in response to natural influences such as geologic activity and temperature change associated with ice age cycles, but ice core data show nearly constant concentrations of CO₂, CH₄ and N₂O over more than 10,000 years prior to the Industrial Revolution. However, since the Industrial Revolution, anthropogenic GHG emissions have resulted in substantial increases in the concentrations of GHGs in the atmosphere (IPCC, 2007d; NRC, 2001a).

Carbon Dioxide (CO₂)

Carbon dioxide concentrations have increased substantially from pre-industrial levels (Figure 2.4). The long-term trends in the CO₂ concentrations are as follows (NOAA, 2009c; Forster et al., 2007; Karl et al., 2009):

- The CO₂ concentration has increased about 38% from a pre-industrial value of about 280 parts per million (ppm) to 385 ppm (which is about 0.039% of the atmosphere by volume) in 2008¹⁸.
- The present atmospheric concentration of CO₂ exceeds by far the natural range over the last 800,000 years (172 to 300 ppm) as determined from ice cores (Karl et al., 2009).
- The annual CO₂ concentration growth rate¹⁹ has been larger since 2000 (2000-2008 average: 1.9 ppm per year), than it was over the previous 20 years (1980-1999 average: 1.5 ppm per year) or since the beginning of continuous direct atmospheric measurements at Mauna Loa (1959–1999 average: 1.3 ppm per year) although there is year-to-year variability.

Almost all of the increase in the CO₂ concentration during the Industrial Era is due to anthropogenic emissions (Forster et al., 2007). Since the 1980s, about half of the anthropogenic emissions have been taken up by the terrestrial biosphere and the oceans, but observations demonstrate that these processes cannot remove all of the extra flux due to human activities. Historically, about half of the anthropogenic emissions have remained in the atmosphere. There is year-to-year variability in the fraction of fossil fuel emissions remaining in the atmosphere due to changes in land-atmosphere fluxes associated with El Niño Southern Oscillation (ENSO²⁰) and events such as the eruption of Pinatubo (Forster et al., 2007). The rate of emission of CO₂ currently exceeds its rate of removal, and the slow and incomplete removal implies that small to moderate reductions in its emissions would not result in stabilization of CO₂ concentrations but rather would only reduce the rate of its growth in coming decades (Meehl et al., 2007).

¹⁸ The 2008 value is preliminary.

¹⁹ The estimated uncertainty in the global annual mean growth rate at marine surface sites is 0.1010 ppm/yr, in the Mauna Loa growth rate it is 0.11 ppm/yr. The 2000-2008 average rate of change at Mauna Loa is 2.0 ppm/yr.

²⁰ ENSO describes the full range of the Southern Oscillation (a see-saw of atmospheric mass or pressure between the Pacific and Indo-Australian areas) that includes both sea surface temperature (SST) increases as well as SST decreases when compared to a long-term average. It has sometimes been used by scientists to relate only to the broader view of El Niño or the warm events, the warming of SSTs in the central and eastern equatorial Pacific. The acronym, ENSO, is composed of El Niño-Southern Oscillation, where El Niño is the oceanic component of the phenomenon, and the Southern Oscillation is the atmospheric component.

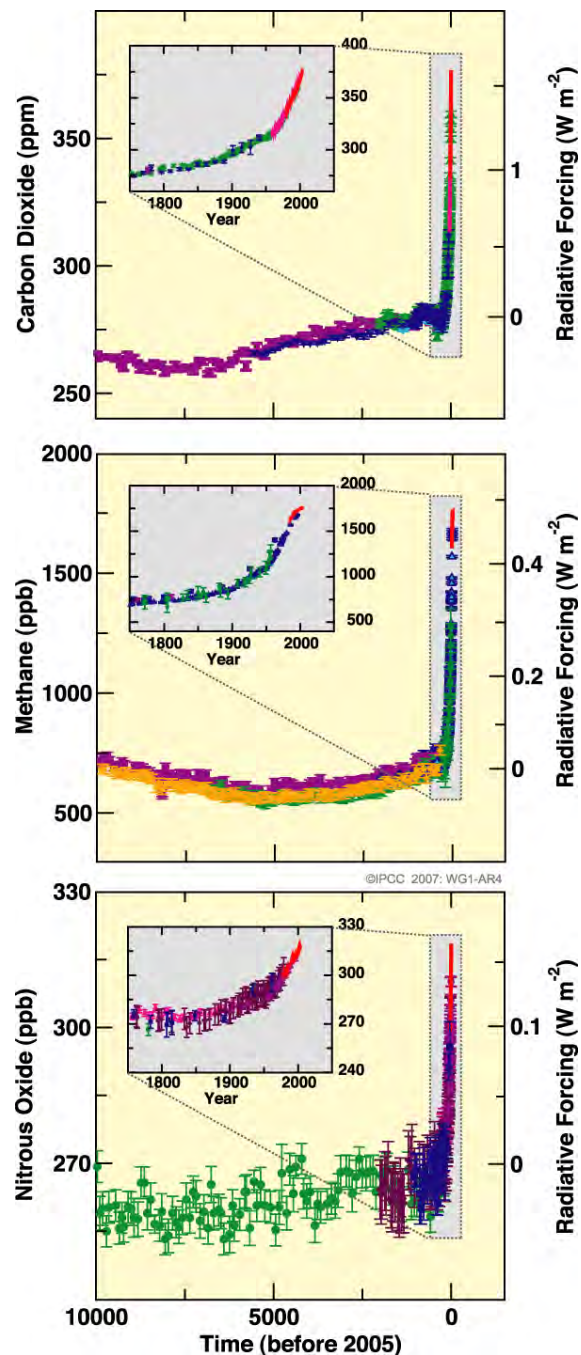
Methane (CH_4)

Methane concentrations have also risen substantially (Figure 2.4). The following trends in atmospheric methane have been observed according to the NOAA *State of the Climate* reports for 2007 and 2008 and IPCC (Horvitz, 2008; Peterson and Baringer, 2009; Forster et al., 2007):

- The global atmospheric concentration of methane has increased from a pre-industrial value of about 715 parts per billion (ppb) to 1732 ppb in the early 1990s, and was 1782 ppb in 2007—a 149% increase from pre-industrial levels.
- The atmospheric concentration of methane in 2007 exceeds by far the natural range of the last 650,000 years (320 to 790 ppb) as determined from ice cores (Jansen et al., 2007).
- Growth rates declined between the early 1990s and mid-2000s. The reasons for the decrease in the atmospheric CH_4 growth rate and the implications for future changes in its atmospheric burden are not well understood but are clearly related to the imbalances between CH_4 sources and sinks.

The methane concentration grew 7.5 ppb between 2006 and 2007, driven by increased emissions in both the Arctic and tropical regions likely caused by high temperatures and precipitation in wetland regions, particularly in the Arctic. Analysis of carbon monoxide measurements suggests little contribution from enhanced biomass burning. Methane concentrations grew again in 2008, with most of the increase driven by the tropics, the first consecutive year-to-year increases since 1998. The observed increase in methane concentration is very likely due to anthropogenic activities, predominantly agriculture and fossil fuel use, but relative contributions from different source types are not well determined (Forster et al., 2007).

Figure 2.4: Atmospheric Concentrations of Carbon Dioxide, Methane and Nitrous Oxide over the Last 10,000 Years



Source: IPCC (2007d). Atmospheric concentrations of carbon dioxide, methane and nitrous oxide over the last 10,000 years (large panels) and since 1750 (inset panels). Measurements are shown from ice cores (symbols with different colors for different studies) and atmospheric samples (red lines). The corresponding radiative forcings (discussed in Section 2(e)) are shown on the right-hand axes of the large panels.

Nitrous Oxide (N₂O)

The N₂O concentration has increased 23% from its pre-industrial value of 262 ppb (Figure 2.4) to 322 ppb in 2007 (Peterson and Baringer, 2009). The concentration has increased linearly by about 0.8 ppb yr⁻¹ over the past few decades and is due primarily to human activities, particularly agriculture and associated land-use change (Forster et al., 2007). Ice core data show that the present atmospheric concentration of N₂O exceeds levels measured in the ice core record of the past 650,000 years, with sufficient resolution to exclude a peak similar to the present for at least the past 16,000 years with very high confidence (Jansen et al., 2007).

Fluorinated Gases

The industrial fluorinated gases that serve as substitutes for chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), such as HFCs, PFCs, and SF₆, have relatively low atmospheric concentrations. Concentrations of many of these gases increased by large factors (between 1.3 and 4.3) between 1998 and 2005. These gases are almost entirely anthropogenic in origin, although CF₄, which contributes 20% of the total forcing due to anthropogenic increases in these gases, has a natural source that accounts for about one-half of its current atmospheric content (Forster et al., 2007).

Ozone-depleting substances covered by the Montreal Protocol

Chlorofluorocarbons and HCFCs are GHGs that are entirely anthropogenic in origin. Emissions of these gases have decreased due to their phase-out under the Montreal Protocol, and the atmospheric concentrations of CFC-11 and CFC-113 are now decreasing due to natural removal processes (Forster et al., 2007). Ice core and in situ data confirm that industrial sources are the cause of observed atmospheric increases in CFCs and HCFCs (Forster et al., 2007).

Ozone (O₃)

Due to its short atmospheric life time, tropospheric ozone concentrations exhibit large spatial and temporal variability. Changes in tropospheric ozone also occur due to changes in transport of ozone across the tropopause (Forster et al., 2007). Relative to the other GHGs, there is less confidence in reproducing the changes in ozone associated with large changes in emissions or climate, and in the simulation of observed long-term trends in ozone concentrations over the 20th century (Forster et al., 2007).

Aerosols (Sulfates, Nitrates, Black Carbon, and Organic Carbon Aerosols)

On a global basis, aerosol mass derives predominantly from natural sources, mainly sea salt and dust. However, anthropogenic (manmade) aerosols, arising primarily from a variety of combustion sources, can dominate concentrations in and downwind of highly populated and industrialized regions and in areas of intense agricultural burning (CCSP, 2009a). Aerosol optical density trends observed in the satellite and surface-based data records suggest that since the mid-1990s, the amount of anthropogenic aerosol has decreased over North America and Europe, but has increased over parts of east and south Asia; on average, the atmospheric concentration of low-latitude smoke particles has increased, consistent with changes in emissions (CCSP, 2009a). Ice core data from Greenland and Northern Hemisphere mid-latitudes show a *very likely* rapid post-industrial era increase in sulfate concentrations above the preindustrial background, though in recent years, SO₂ emissions have decreased globally and in many regions of the Northern Hemisphere. In general, the concentration, composition, and distribution of aerosols in the paleoclimate record are not as well known as the long-lived GHGs (Jansen et al., 2007).

EXHIBIT 19

IPCC 4th Assessment Report, Chapter 7 (excerpts)

7

Couplings Between Changes in the Climate System and Biogeochemistry

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Review Editors:

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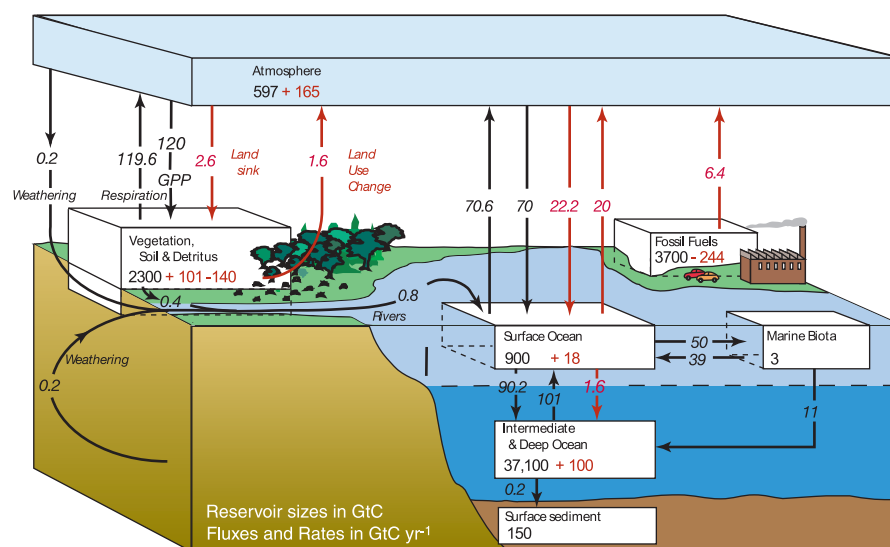


Figure 7.3. The global carbon cycle for the 1990s, showing the main annual fluxes in GtC yr⁻¹: pre-industrial 'natural' fluxes in black and 'anthropogenic' fluxes in red (modified from Sarmiento and Gruber, 2006, with changes in pool sizes from Sabine et al., 2004a). The net terrestrial loss of -39 GtC is inferred from cumulative fossil fuel emissions minus atmospheric increase minus ocean storage. The loss of -140 GtC from the 'vegetation, soil and detritus' compartment represents the cumulative emissions from land use change (Houghton, 2003), and requires a terrestrial biosphere sink of 101 GtC (in Sabine et al., given only as ranges of -140 to -80 GtC and 61 to 141 GtC, respectively; other uncertainties given in their Table 1). Net anthropogenic exchanges with the atmosphere are from Column 5 'AR4' in Table 7.1. Gross fluxes generally have uncertainties of more than ±20% but fractional amounts have been retained to achieve overall balance when including estimates in fractions of GtC yr⁻¹ for riverine transport, weathering, deep ocean burial, etc. 'GPP' is annual gross (terrestrial) primary production. Atmospheric carbon content and all cumulative fluxes since 1750 are as of end 1994.

change (primarily deforestation) (Table 7.1). Almost 45% of combined anthropogenic CO₂ emissions (fossil fuel plus land use) have remained in the atmosphere. Oceans are estimated to have taken up approximately 30% (about 118 ± 19 GtC: Sabine et al., 2004a; Figure 7.3), an amount that can be accounted for by increased atmospheric concentration of CO₂ without any change in ocean circulation or biology. Terrestrial ecosystems have taken up the rest through growth of replacement vegetation on cleared land, land management practices and the fertilizing effects of elevated CO₂ and N deposition (see Section 7.3.3).

Because CO₂ does not limit photosynthesis significantly in the ocean, the biological pump does not take up and store anthropogenic carbon directly. Rather, marine biological cycling of carbon may undergo changes due to high CO₂ concentrations, via feedbacks in response to a changing climate. The speed with which anthropogenic CO₂ is taken up effectively by the ocean, however, depends on how quickly surface waters are transported and mixed into the intermediate and deep layers of the ocean. A considerable amount of anthropogenic CO₂ can be buffered or neutralized by dissolution of CaCO₃ from surface sediments in the deep sea, but this process requires many thousands of years.

The increase in the atmospheric CO₂ concentration relative to the emissions from fossil fuels and cement production only is defined here as the 'airborne fraction'.² Land emissions, although significant, are not included in this definition due to the difficulty of quantifying their contribution, and to the complication that much land emission from logging and clearing of forests may be compensated a few years later by

uptake associated with regrowth. The 'airborne fraction of total emissions' is thus defined as the atmospheric CO₂ increase as a fraction of total anthropogenic CO₂ emissions, including the net land use fluxes. The airborne fraction varies from year to year mainly due to the effect of interannual variability in land uptake (see Section 7.3.2).

7.3.1.3 New Developments in Knowledge of the Carbon Cycle Since the Third Assessment Report

Sections 7.3.2 to 7.3.5 describe where knowledge and understanding have advanced significantly since the Third Assessment Report (TAR). In particular, the budget of anthropogenic CO₂ (shown by the red fluxes in Figure 7.3) can be calculated with improved accuracy. In the ocean, newly available high-quality data on the ocean carbon system have been used to construct robust estimates of the cumulative ocean burden of anthropogenic carbon (Sabine et al., 2004a) and associated changes in the carbonate system (Feely et al., 2004). The pH in the surface ocean is decreasing, indicating the need to understand both its interaction with a changing climate and the potential impact on organisms in the ocean (e.g., Orr et al., 2005; Royal Society, 2005). On land, there is a better understanding of the contribution to the buildup of CO₂ in the atmosphere since 1750 associated with land use and of how the land surface and the terrestrial biosphere interact with a changing climate. Globally, inverse techniques used to infer the magnitude and location of major fluxes in the global carbon

² This definition follows the usage of C. Keeling, distinct from that of Oeschger et al. (1980).

EXHIBIT 20

**Wall Street Journal,
“A Glorious Mess”
(Apr. 12, 2008)**

[Databases selected:](#) Wall Street Journal

THE WALL STREET JOURNAL. 'A Glorious Mess'

Wall Street Journal. (Eastern edition). New York, N.Y.: Apr 12, 2008. pg. A.8

Abstract (Summary)

The venerable Michigan Democrat had the candor to point out that if climate change is really the transcendent challenge his party says it is, then Congress should bother to pass legislation, not outsource policy to the Environmental Protection Agency.

Full Text (537 words)

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Usually Congressional subcommittee hearings are as routine and tedious as they sound, but John Dingell managed to enliven one on Thursday. The venerable Michigan Democrat had the candor to point out that if climate change is really the transcendent challenge his party says it is, then Congress should bother to pass legislation, not outsource policy to the Environmental Protection Agency.

For months, the little tyrants of the global warming caucus -- Barbara Boxer, Henry Waxman, Ed Markey -- have been trying to force the EPA into declaring that carbon dioxide is a dangerous pollutant under current clean air laws, which could result in a cap-and-trade program by regulatory decree. Such posturing allows Democrats to display crocodile outrage and take credit for "leadership" on a popular goal, while shifting the blame for the costs of achieving it onto the EPA. In the bargain, it insulates them from political consequences and avoids the grubby business of actually crafting some global warming "solution."

The charade is too much for Mr. Dingell, the Chairman of the powerful House Energy and Commerce Committee. Diverging from his prepared remarks, he said it was leading to "a glorious mess" and called the liberal bluff: "As a matter of national policy, it seems to me to be insane that we would be talking about leaving this kind of judgment, which everybody tells us has to be addressed with great immediacy, to a long and complex process of regulatory action."

If the conclusion on CO₂ is desperately self-evident for the EPA, Mr. Dingell suggested, then the same should be true for the Democratic majority -- even more so. Regulating carbon involves "inherently political decisions that should be made by the Congress. It should not fall to EPA by default."

Mr. Dingell also made a useful point about "the wonderful complexity" that would result assuming his colleagues got their way. If CO₂ is regulated like a conventional pollutant under the 1970 Clean Air Act, it would trigger an economy-wide cascade of new rules and mandates. Just about everything that emits carbon would be affected, including cars, factories and power plants, but also farms, schools, hospitals, restaurants, office buildings, etc. Mr. Dingell was perhaps overstating his case when he said it had "the potential for shutting down or slowing down virtually all industry and all economic activity and growth," but not by much.

Mr. Dingell sardonically emphasized that he supports regulating greenhouse-gas emissions in a "comprehensive, exhaustive, thoughtful and intelligent way." But if he was only indulging what he views as a political inevitability, he also knows that the costs will fall disproportionately on some constituencies over others, most notably his blue-collar voters. His indiscretion underscored the separation between Democratic blandishments about painless global warming controls and the economic reality.

This isn't the first time that Mr. Dingell has had some fun with the politics of global warming and drawn the wrath of

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Nancy Pelosi and the rest of the green Democrats to be more truthful about their environmental artifices. He may be one of Congress's last honest liberals.

(See related letter: "Letters to the Editor: We Are All CO2 Emitters" -- WSJ April 18, 2008)

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EXHIBIT 21

Declaration of Charles H. Kerr

**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondents.

No. 09-1322 and consolidated
cases

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1073 and consolidated
cases

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1092 and consolidated
cases

SOUTHEASTERN LEGAL
FOUNDATION, ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1131 and consolidated
cases

**Declaration of Charles H. Kerr, Chairman of the Board, Great Northern
Project Development, L.P.**

I, Charles H. Kerr, swear or affirm under penalty of perjury, the following:

1. I am Chairman of the Board of GNPD, Inc., the general partner of Great Northern Project Development, L.P. (collectively, "GNPD"), petitioner in the above-captioned case, and I have firsthand knowledge of the facts set forth herein.

2. I am more than twenty-one (21) years of age and I am competent to make this affidavit.

3. I have been with GNPD since its inception in 2001. I served as GNPD's President and Chief Executive Officer from 2004 to 2009, and became Chairman of the Board in 2009.

4. GNPD is a member of the Coalition for Responsible Regulation, Inc.

5. GNPD is a privately-held company formed to pursue the development, construction, and operation of energy projects. GNPD is currently developing a coal-to-electricity project in South Heart, North Dakota ("South Heart Project") through its subsidiary, South Heart Development LLC ("South Heart Development"). South Heart Development LLC and Allied Syngas Corporation each have a 50 percent ownership share in South Heart Coal LLC, which owns the mine that will produce the coal for the South Heart Project, and South Heart Energy Development LLC ("South Heart Energy"), which will own and operate the South Heart Project plant.

6. The South Heart Project originally was developed as a direct combustion, circulating fluidized bed facility that would economically produce steam at a high temperature and pressure in order to generate electricity. However, as a direct result of the uncertainties surrounding regulation of greenhouse gases ("GHG"), South Heart Development concluded that it would be difficult, if not impossible, to

obtain power sales contracts, the requisite financing and to successfully permit a coal-to-electricity facility that did not include provisions for CO₂ emission reduction. As a result, South Heart Development investigated alternative technologies capable of reducing CO₂ emissions and concluded that the most viable option for the South Heart Project was to pursue development of a coal gasification plant.

7. Coal gasification technology, through a chemical reaction, converts coal into a synthetic gas ("syngas", a gaseous mixture of carbon monoxide and hydrogen), which is then burned in combustion turbines to generate electricity. Coal gasification plants like the one considered for the South Heart Project use advanced gas cleanup technologies to remove various pollutants from the syngas before it is combusted, which could include the removal of the majority of the CO₂ released during the gasification process (which is the current South Heart Project design). Such plants can also control the composition of the product syngas by increasing hydrogen content to further reduce its carbon content post combustion.

8. Unlike conventional plants, coal gasification plants are configured in such a way that it is technically possible on a commercial scale to capture a high purity carbon dioxide stream. This CO₂ stream would include CO₂ released during gasification plus other carbon compounds removed from the syngas before it is combusted. Removing those other carbon compounds from the pre-

combustion syngas is costly and is not necessary to the operation of a gasification plant, but doing so would independently reduce carbon dioxide emissions resulting from the combustion of the syngas. By contrast, the configuration of conventional direct fired coal-to-electricity plants allows the capture of CO₂ only from the post-combustion flue gas. CO₂ in the flue gas is much more dilute and is currently not feasible to capture on a commercial scale. South Heart Development believes that adoption of a gasification design would place the project in the best position to comply with carbon regulations and future Best Available Control Technology (“BACT”) standards, but this is not certain because the specific requirements for BACT standards for electricity generating units have not yet been established. Gasification plants have high capital costs and perform at lower thermal efficiencies that require more fuel than conventional plants that directly combust coal. An additional cost of switching to gasification technology for the South Heart Project would be the requirement to preprocess the coal to lower its moisture content and increase its Btu content to make it suitable for gasification. As a result, gasification plants are substantially more expensive and complicated to develop than conventional plants. The cost and complexity rise higher still in gasification plants with each additional amount of carbon removed from the pre-combustion syngas.

9. The uncertainties surrounding the regulation of GHGs are irreparably harming South Heart Development by delaying the South Heart Project, increasing the costs of planning the project, and potentially forcing South Heart Development to the more expensive gasification design with unknown carbon capture requirements. The project's financial prospects would worsen if the facility were required to capture and permanently sequester carbon dioxide. The harm to South Heart Development increases each day that the project is delayed. A conventional design is likely economic to construct and operate in the absence of carbon regulations but given the uncertainties surrounding the regulation of GHGs, perception by customers and lenders that GHG reduction is necessary, GNPD believes a conventional plant cannot currently be built, financed or permitted. Nonetheless, South Heart Development has invested substantial sums in this project and in order to protect and potentially extract value from its investment to date, concludes it is currently prudent to continue pursuing the project while South Heart Development attempts to discern what regulatory requirements it will face.

10. EPA's issuance of the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) ("Endangerment Finding"), and the regulations that EPA has promulgated as a result of the Endangerment Finding, threaten to require reductions in carbon dioxide emissions for any coal-fired facility, potentially

through carbon capture and sequestration. Currently, the only commercially demonstrated technology capable of carbon capture in an electrical generation unit requires gasification as a prerequisite. South Heart Development's investigation of gasification technology demonstrated that the additional costs of gasification without carbon capture and permanent CO₂ sequestration makes it commercially disadvantaged to conventional plants. A *requirement* to reduce carbon emissions through carbon capture and permanent sequestration or some other means would worsen the economic prospects of the South Heart Project, especially if those requirements involved retrofitting the facility after construction. As a result, EPA's regulations substantially threaten the viability of South Heart Development and its coal-to-electricity project.

11. Upon issuance of the Endangerment Finding, EPA moved forward with regulating emissions of GHG from motor vehicles. On May 7, 2010, EPA and the National Highway Traffic Safety Administration ("NHTSA") issued vehicle GHG emission standards and average fuel economy standards for light-duty vehicles. 75 Fed. Reg. 25,324 (May 7, 2010). EPA maintains that this action triggered regulation of GHG under other provisions of the Clean Air Act, specifically stationary source permitting under the Prevention of Significant Deterioration ("PSD") and Title V programs. When the stationary source provisions are triggered, the statutory text would require all sources that emit more than 100 tons

per year of carbon dioxide equivalent to apply for a Title V operating permit. New sources that emit more than 100 tons per year or 250 tons per year of carbon dioxide equivalent (depending on the source category), and existing sources that undertake major modifications that are projected to increase emissions of GHG by any amount, would be required by statute to go through the PSD permitting process. The South Heart Project, as currently configured, would exceed these thresholds.

12. EPA's Tailoring Rule will phase in the statutory thresholds for triggering stationary source permitting for GHG. Pursuant to the Tailoring Rule, beginning in January 2011, new or modified sources that must undergo PSD permitting for pollutants other than greenhouse gases, but also will increase emissions of GHG by 75,000 tons per year of carbon dioxide equivalent, will trigger PSD permitting for GHG. As of July 1, 2011, sources with the potential to emit 100,000 tons per year of carbon dioxide equivalent will be considered major sources subject to PSD review, and major modifications at existing sources resulting in net GHG emissions increases of 75,000 tons per year of carbon dioxide equivalent will be subject to PSD review. Title V permitting for GHG also will be phased in as follows: between January and July 2011, only those sources that must apply for, renew, or revise their permits for pollutants other than GHG must incorporate GHG-specific requirements into their permits, and after July 2011,

sources that emit more than 100,000 tons per year of carbon dioxide equivalent will be required to obtain a Title V permit. EPA states in the Tailoring Rule that it will undertake another rulemaking that will take effect by July 1, 2013 that may lower these thresholds for PSD and Title V applicability. I am aware that the Tailoring Rule and its increased major source thresholds are being challenged. I am also aware that the Endangerment Finding, which is the underlying foundation upon which EPA is embarking on GHG regulation and rule making, is also being challenged.

13. The uncertainty of the challenge to the Endangerment Finding, the regulation of stationary sources of GHG, the uncertainty surrounding how PSD permitting will be implemented, and the uncertainty surrounding what the Best Available Control Technology will be for the South Heart Project have resulted in, and continue to cause, significant delays, increased costs that cannot be recouped and difficulty generating investment in and customers for electricity generated by the project.

14. The uncertainty surrounding how PSD permitting for GHG will be implemented by states is causing on-going and irreparable harm to South Heart Development. Under the statutory thresholds and pursuant to EPA's Tailoring Rule, the South Heart Project's potential GHG emissions trigger applicability of PSD and Title V permitting requirements specific to GHG. South Heart Energy

has initiated the process of preparing its PSD permit application for submission to the North Dakota Department of Health and originally planned to submit that application in 2010. However, the uncertainty surrounding the scope and implementation of EPA's GHG regulations and North Dakota's implementation of PSD permitting for GHG has delayed preparation of the permit application and increased planning costs.

15. As part of its PSD permit application, South Heart Energy will be required to analyze carbon dioxide emissions control in a BACT analysis and consider GHG emissions for Title V permitting. A BACT analysis could lead to the establishment of CO₂ emission control requirements and emission limits that would apply to the South Heart Project. Because BACT is a moving target, South Heart Energy has been unable to conform the project to a standard set of rules and regulations. For example, it is unclear whether sequestration will be considered BACT or how carbon sequestration will be treated under PSD permitting. Depending on the structure of any future sequestration rules, South Heart Development may or may not be allowed to recover some carbon capture costs by selling CO₂ to oil and gas producers for use in enhanced oil recovery. In fact, South Heart Development has determined that a gasification plant that is designed with carbon capture and permanent sequestration is currently uneconomic. This uncertain regulatory environment has made it impossible for South Heart

Development to (i) lock in a firm engineering design for equipment specifications, cost analysis and emissions profile modeling, and (ii) secure contracts from CO₂ off-takers needed to transfer custody and control of the CO₂ to be sequestered. If BACT is determined to require carbon capture and permanent sequestration, it will likely result in cancellation of the South Heart Project.

16. The process of PSD and Title V permitting for emissions of carbon dioxide from the South Heart Project, including the BACT demonstration and expected permit challenges by environmental groups, is resulting in substantial delays and adding costs to the project development budget. One-half of all additional costs are absorbed by GNPD. In the face of continued uncertainty and a potential requirement to capture and permanently sequester CO₂, GNPD is prudently reconsidering the financial and physical viability of the South Heart Project.

17. In addition to project development costs, the uncertainties surrounding whether the South Heart Project can be successfully permitted is causing South Heart Development's potential customers to withhold commitments to the project. South Heart Development cannot finalize contracts for long-term base load generation that customers will need, starting in the next four to six years, with the uncertainty surrounding the time it will take to address the complexities of GHG permitting for the project. The inability to generate additional interest in the

purchase of the project's electric power output also could result in cancellation of the project.

18. The threat of GHG regulation is also causing South Heart Development's potential lenders to withhold commitments to finance the construction of the Project. Inability to secure financing will, at the very least, substantially delay and potentially cause the cancellation of the South Heart Project.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 15, 2010.



Charles H. Kerr

EXHIBIT 22

Declaration of Michael R. Peelish

**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondents.

No. 09-1322 and consolidated
cases

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1073 and consolidated
cases

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1092 and consolidated
cases

SOUTHEASTERN LEGAL
FOUNDATION, ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1131 and consolidated
cases

**DECLARATION OF MICHAEL R. PEELISH, EXECUTIVE VICE
PRESIDENT AND CHIEF SUSTAINABILITY OFFICER,
ALPHA NATURAL RESOURCES, INC.**

I, Michael R. Peelish, swear or affirm under penalty of perjury the
following:

1. I am Executive Vice President and Chief Sustainability Officer at Alpha
Natural Resources, Inc. (“Alpha Natural Resources”), Petitioner in the above-
captioned case, and I have firsthand knowledge of the facts set forth herein.

2. I am more than twenty-one (21) years of age and I am competent to make this declaration.

3. Alpha Natural Resources is a major supplier of thermal coal to electric utilities and manufacturing industries across the country, and a leading producer and exporter of metallurgical coal used in the steelmaking process. Alpha Natural Resources operates 60 mines and 14 coal preparation plants in Virginia, West Virginia, Kentucky, Pennsylvania, and Wyoming, and employs 6,200 individuals throughout the United States.

4. Alpha Natural Resources is a member of the Coalition for Responsible Regulation, Inc.

5. Alpha Natural Resources controls approximately 1.6 billion tons of coal reserves in the eastern United States, and approximately 700 million tons of coal reserves, through either fee title or federal lease, in Wyoming's Powder River Basin. In 2009, Alpha Natural Resources sold 47.2 million tons of coal. Of this total, approximately 39 million tons was steam coal, including approximately 38 million tons used for electricity generation and approximately 900,000 tons sold for industrial boilers. Alpha Natural Resources sold 8.13 million tons of eastern metallurgic coal in 2009 for use in steelmaking.

6. EPA's issuance of the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg.

66,496 (Dec. 15, 2009) (“Endangerment Finding”), and the regulations that EPA has promulgated as a result of the Endangerment Finding, are threatening substantial and irreparable economic harm to coal producers like Alpha Natural Resources, which produce primarily steam coal for use in the generation of electricity.

7. Upon issuance of the Endangerment Finding, EPA moved forward with regulating emissions of greenhouse gases from motor vehicles. On May 7, 2010, EPA and the National Highway Traffic Safety Administration (“NHTSA”) issued vehicle greenhouse gas emission standards and average fuel economy standards for light-duty vehicles. 75 Fed. Reg. 25,324 (May 7, 2010). EPA maintains that this action triggered regulation of GHG under other provisions of the Clean Air Act, specifically stationary source permitting under the Prevention of Significant Deterioration (“PSD”) and Title V programs. When the stationary source provisions are triggered, the statutory text would require all sources that emit more than 100 tons per year of carbon dioxide equivalent to apply for a Title V operating permit. New sources that emit more than 100 tons per year or 250 tons per year of carbon dioxide equivalent (depending on the source category), and sources that undertake major modifications at existing sources that are projected to increase emissions of greenhouse gases by any amount, would be required by statute to go through the PSD permitting process. *Id.*

8. EPA proposes in its Tailoring Rule to phase-in the statutory thresholds for triggering stationary source permitting for GHG. Pursuant to the Tailoring Rule, beginning in January 2011, new or modified sources that must undergo PSD permitting for pollutants other than greenhouse gases, but will also increase emissions of greenhouse gases by 75,000 tons per year of carbon dioxide equivalent, will trigger PSD permitting for greenhouse gases. As of July 1, 2011, sources with the potential to emit 100,000 tons per year of carbon dioxide equivalent will be considered major sources subject to PSD review, and major modifications resulting in net greenhouse gas emissions increases of 75,000 tons per year of carbon dioxide equivalent will be subject to PSD review. Title V permitting for greenhouse gases also will be phased in as follows: between January and July 2011, only those sources that must apply for, renew, or revise their permits for pollutants other than greenhouse gases must incorporate greenhouse gas applicable requirements into their permits, and after July 2011, sources that emit more than 100,000 tons per year of carbon dioxide equivalent will be required to obtain a Title V permit. EPA states in the Tailoring Rule that it will undertake another rulemaking that will take effect by July 1, 2013, that may lower these thresholds for PSD and Title V applicability. I am aware that the Tailoring Rule and the increased thresholds are being challenged.

9. The thermal coal dryers located at two of Alpha Natural Resources' facilities will emit more than 25,000 tons per year of carbon dioxide equivalent in 2011 and therefore would be subject to the statutory thresholds for Title V and PSD permitting. Neither of these facilities is currently subject to Title V or PSD requirements.

10. Even though 25,000 tons per year is less than the initial thresholds found in the Tailoring Rule, the suite of GHG regulations issued by the EPA creates substantial uncertainty for companies such as Alpha Natural Resources that emit 25,000 tons per year or even 100 tons per year of carbon dioxide equivalent. Alpha Natural Resources faces the prospect of potentially inconsistent regulation by the states, the prospect of lower emissions thresholds under the upcoming July 1, 2013 modifications to the Tailoring Rule, and the prospect that the Tailoring Rule will not withstand judicial review. This uncertainty irreparably harms Alpha Natural Resources' ability to plan for physical or operational changes at its coal preparation plants.

11. The Endangerment Finding and the associated regulation also is substantially affecting Alpha Natural Resource's profitability outlook for domestic steam coal production. The combustion of coal, by its very nature, results in the emission of substantial amounts of carbon dioxide. EPA's conclusions that greenhouse gases "may reasonably be anticipated both to endanger public health

and to endanger public welfare,” 74 Fed. Reg. at 66,497, affects the perception of coal as a viable long-term source of electricity and makes coal a less desirable commodity. Moreover, the uncertainty surrounding the regulation of stationary sources of greenhouse gases is having a substantial impact on demand for coal, particularly steam coal for electricity generation.

12. I am aware that a number of our utility customers are switching units to natural gas, dropping planned expansions, or shutting down coal-fired facilities altogether as a result of, in large part, costs associated with the pending regulation of greenhouse gases. Electric utilities and independent power producers that are adding capacity are being pressured by EPA’s regulations, and by the uncertainty arising from those regulations, to design and construct electric generating units that do not use coal. New electric generating units will remain in service for decades, effectively locking in the lower demand for coal. Our coal stockpiles are as high as they’ve ever been, and I expect this trend to continue. Indeed, our 2010 production forecast for utility customers is down. A further reduction in the demand of coal from utility customers reasonably can be expected to result in decreased revenues that cannot be remedied in future years, thereby causing irreparable harm to Alpha Natural Resources.

13. Alpha Natural Resources’ mining operations also use substantial amounts of electricity, which Alpha Natural Resources purchases from local power

producers. Alpha Natural Resources purchases on average a total of 860,707,186 kilowatt hours of electricity annually, which comprises approximately seven percent of its operating costs.

14. In light of the substantial amount of electricity that Alpha Natural Resources uses in its operations, any increase in the costs of electricity resulting from the regulation of greenhouse gases emitted from coal-fired electric generation units will increase Alpha Natural Resources' operating costs, thereby inflicting harm on Alpha Natural Resources.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 13, 2010.


Michael R. Peelish

EXHIBIT 23

**Petition of Humane Society of
the U.S., et al. to EPA
(Sept. 21, 2009)**

BEFORE THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

THE HUMANE SOCIETY OF THE UNITED STATES, ASSOCIATION
OF IRRITATED RESIDENTS, CENTER ON RACE, POVERTY AND
THE ENVIRONMENT, CLEAN AIR TASK FORCE, DAIRY
EDUCATION ALLIANCE, EL COMITÉ PARA EL BIENESTAR DE
EARLIMART, ENVIRONMENTAL INTEGRITY PROJECT, FRIENDS
OF THE EARTH, AND WATERKEEPER ALLIANCE

Petitioners.

v.

LISA P. JACKSON, ADMINISTRATOR,
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

**PETITION TO LIST CONCENTRATED ANIMAL FEEDING
OPERATIONS UNDER CLEAN AIR ACT SECTION 111(B)(1)(A)
OF THE CLEAN AIR ACT, AND TO PROMULGATE
STANDARDS OF PERFORMANCE UNDER CLEAN AIR ACT
SECTIONS 111(B)(1)(B) AND 111(D).**

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I. INTRODUCTION

The Humane Society of the United States, Association of Irrigated Residents, Center on Race, Poverty and the Environment, Clean Air Task Force, Dairy Education Alliance, El Comité para el Bienestar de Earlimart, Environmental Integrity Project, Friends of the Earth, and Waterkeeper Alliance (the Coalition) hereby petitions the United States Environmental Protection Agency (EPA) to use its authority under Clean Air Act (CAA) section 111, 42 U.S.C. § 7411, to list concentrated animal feeding operations (CAFOs) as a category of sources under CAA section 111(b)(1)(A), to promulgate standards of performance for new CAFOs under CAA section 111(b)(1)(B), and to prescribe regulations for state performance standards for existing CAFOs under CAA section 111(d).

Over the last several decades, increasing numbers of animals are being raised in fewer, but larger, operations, in which animals are intensively confined in small spaces such as battery cages, veal and gestation crates, and other warehouse-like conditions.¹ The increased waste and emissions associated with this production method result in air pollution that contributes to climate change,² causes serious public health concerns, and harms the environment.³ The Food and Agriculture Organization of the United Nations (FAO) deemed the livestock sector “one of the top two or three most significant contributors

¹ RL KELLOGG RL, ET AL, USDA NATURAL RES. CONSERVATION SERV., MANURE NUTRIENTS RELATIVE TO THE CAPACITY OF CROPLAND AND PASTURELAND TO ASSIMILATE NUTRIENTS: SPATIAL AND TEMPORAL TRENDS FOR THE UNITED STATES (2000), *available at* www.nrcs.usda.gov/technical/NRI/pubs/mannttr.pdf; *see also* U.S. Environmental Protection Agency (EPA) Emission Stand. Div., Office of Air Quality Planning and Stand., Emissions From Animal Feeding Operations, Preliminary draft report xi (Aug. 15, 2001), *available at* www.epa.gov/ttn/chief/ap42/ch09/draft/draftanimalfeed.pdf [hereinafter U.S. EPA Emissions from AFOs].

² See H. Steinfeld et al., U.N. Food & Agric. Org., Livestock's Long Shadow: Environmental Issues and Options 272 (2006), *available at* <http://www.fao.org/docrep/010/a0701e/a0701e00.htm> [hereinafter FAO Livestock's Long Shadow].

³ American Public Health Association. 2003. Precautionary moratorium on new concentrated animal feed operations. Policy Number 2003-7. www.apha.org/advocacy/policy/policysearch/default.htm?id=1243.

to the most serious environmental problems, at every scale from local to global.”⁴ This same report found that animal agriculture was responsible for contributing to greenhouse gas emissions more than even the transport sector.⁵ Pollution from farm animal production is only continuing to increase, making emissions from farm animal production some of the nation’s largest anthropogenic sources of pollution.⁶

Despite clear evidence that factory farms contribute significantly to anthropogenic emissions of methane, nitrous oxide, hydrogen sulfide, and ammonia, the EPA does not require CAFOs to meet any testing, performance, or emission standards under the Clean Air Act. Given available evidence, however, it is unreasonable for the EPA Administrator not to find immediately that air emissions from CAFOs cause and contribute significantly to air pollution that is reasonably anticipated to endanger public health and welfare. Because CAFOs emit significant amounts of these pollutants, all of which have been shown to have negative effects on human and animal health and on welfare (including adverse effects on climate and the environment in the United States), the Administrator must promulgate nationwide standards of performance to minimize the impacts from new existing CAFOs, and standardize the currently developing patchwork of state and local regulation of existing CAFOs.

The Coalition has a vital interest in reducing emissions of the major pollutants from CAFOs to improve human health, reduce suffering in farm animals, protect habitats for wildlife, reduce pollution problems that keep our members from enjoying wildlife, and reduce the effects of climate change and other pollution problems.

⁴ FAO Livestock’s Long Shadow at xx.

⁵ *Id.* at 272.

⁶ Nat’l Risk Mgmt Research Laboratory, Review of Emission Factors and Methodologies to Estimate Ammonia Emissions From Animal Waste Handling 1 (2002), *available at* <http://www.epa.gov/ORD/NRMRL/Pubs/600R02017/600R02017.pdf>.

Listing CAFOs under section 111, and promulgating strong national air emissions performance standards for new and existing CAFOs will have an immediate positive impact on public health, climate, animal health, and environmental integrity. Numerous scientific surveys, including the U.S. Inventory Report adopted by the EPA, establish that CAFOs meet the standards for regulation under section 111 of the Clean Air because they cause or contribute significantly to air pollution which endangers public health and welfare. 42 U.S.C. § 7411(b)(1)(A). Moreover, as set forth herein, CAFOs are a significant source of short-term climate forcing air pollutants – setting performance standards for these pollutants will yield immediate positive climate benefits. CAFOs also contribute significantly to other air pollution that has direct adverse impacts on public health, and animal welfare. Promulgating new source performance standards will create a strong incentive for new CAFOs to use production methods that protect public health and welfare and will allow enforcement by the government or private citizens when factory farms violate those emissions limits. In addition, U.S. EPA must act to immediately prescribe regulations for states to set performance standards for existing CAFOs.

The threat to public health and welfare caused by the greenhouse gases and other air pollutants emitted by CAFOs necessitates an immediate determination that CAFOs cause or contribute significantly to the air pollution that endangers public health and welfare, the listing of the CAFO industry, and its regulation by EPA under CAA section 111. It is unreasonable, therefore, for the Administrator not to list CAFOs under section 111(b)(1)(A), as an industry requiring regulations under CAA sections 111(b)(1)(B) and (d), that reflect the “degree of emission limitation achievable through the best system of emissions reduction that has been adequately demonstrated”. 42 U.S.C. §§ 7411(a)(1), (b), (d).

Accordingly, for the reasons discussed herein and in the accompanying record materials, The Coalition respectfully requests the EPA, pursuant to section 553(e) of the Administrative Procedure Act, 5 U.S.C. § 553(e), to undertake a rulemaking that:

1. finds that the air pollutants hydrogen sulfide and ammonia constitute air pollution that endangers U.S. public health or welfare;
2. announces the Administrator's judgment that emissions of methane, nitrous oxide, hydrogen sulfide, ammonia, volatile organic compounds, and particulate matter from CAFOs contribute significantly to air pollution that is reasonably anticipated to endanger public health and welfare;
3. lists CAFOs as a category of stationary sources pursuant to Section 111(b), of the Clean Air Act, 42 U.S.C. § 7411(b); and
4. promulgates for CAFOs performance standards for air emissions of methane, nitrous oxide, hydrogen sulfide, ammonia, volatile organic compounds, and particulate matter from new and existing CAFOs pursuant to the authority of sections 111(b) and 111(d) of the Clean Air Act, 42 U.S.C. §§ 7411(b), (d).

II. INTERESTS OF THE PETITIONERS

The Coalition is a group of international, national, and regional organizations whose missions all include advocating against practices that result in unhealthy levels of pollutants being discharged from industrial animal agriculture. Together the Coalition members have millions of members and constituents who are concerned about the pollution from industrial animal agriculture. Members and constituents of the Coalition are affected by the impacts of climate change and other pollution problems caused by CAFOs. These millions of members have a strong personal interest in protecting their own health as well as in conserving and ensuring the safety of animals affected by climate change. The Coalition files this petition on behalf of itself and its adversely affected members and constituents.

The Humane Society of the United States (the HSUS) is a national and international non-profit charitable organization that promotes the protection of all animals.

The HSUS maintains its headquarters in Washington, D.C., and has offices, affiliates, or staff in 25 states, the District of Columbia, and five foreign countries.⁷ Through its policy, legislative, litigation, and grass-roots activities, The HSUS has become the nation's largest and most effective animal protection organization, with more than 10.5 million members and constituents. The HSUS actively advocates against practices that harm all animals, including practices that result in unhealthy levels of pollutants being discharged into farm animal and wildlife habitats. Members of The HSUS in the Lathrop, California community have recently teamed up with The HSUS to bring a suit against a large chicken CAFO that emits toxic levels of ammonia into their neighborhood.

The Association of Irrigated Residents (AIR) is an unincorporated association with members residing in Kings, Tulare, Kern, Fresno, and Stanislaus counties, all of which are located in the San Joaquin Valley air basin in California. AIR's organizational purpose is to advocate for air quality and environmental health in the San Joaquin Valley.

Established in 1999 after a pesticide accident, El Comité para el Bienestar de Earlimart is an unincorporated association dedicated to protecting environmental health and advocating for air quality and reducing pesticide use in the San Joaquin Valley. El Comité's members reside in Earlimart, California. El Comité has been active in educating community members on pesticide and air pollution regulations and how to report violations. However, a more important goal for El Comité is empowering community residents to fight the low-level, day-to-day pollution whose cumulative effect is more significant than the larger, more visible accidents.

⁷ AL, AR, AZ, CA, FL, GA, IL, IN, KS, KY, LA, RI, MN, NC, NJ, NY, OH, OK, OR, PA, RI, TN, TX, VA, WA, Canada, Indonesia, Australia, United Kingdom, and Costa Rica.

Clean Air Task Force (CATF) is a national non-profit organization dedicated to restoring clean air and healthy environments, including securing advances against climate change through scientific research, public education, and legal advocacy. Our efforts include advocacy aimed not only at securing CO₂ emissions reductions, but also mitigating the climate change impacts associated with major sources of climate forcing air pollutants such as methane. As set forth in this petition, concentrated animal production activities are significant sources of climate forcing air pollution causing significant public health and environmental impacts, and therefore fall squarely within the universe of sources for which CATF seeks emissions reductions.

The Center on Race, Poverty & the Environment is a non-profit organization that provides legal and technical assistance to the grassroots movement for environmental justice. The Center has offices in San Francisco and Delano, California.

The Dairy Education Alliance (DEA) is a national coalition of farmers, grass-roots activists, environmentalists, scientists, public interest lawyers and economists from around the country working collaboratively to tackle the environmental, social and economic problems associated with industrial-sized dairy operations (CAFOs). The DEA currently has member organizations from over 10 states. Some of our member organizations include: Amargosa Citizens for the Environment (NV); Advocates for the West (ID); Center on Race, Poverty and the Environment (CA); Community Association for Restoration of the Environment (WA); Environmentally Concerned Citizens of South Central Michigan (MI); Family Farms for the Future (MO); Idaho Concerned Area Residents for the Environment (ID); Idaho Rural Council (ID); Neighbors United for the Finger Lakes (NY); Northwest Environmental Defense Center (OR); Socially Responsible Agricultural Project; and the Western Environmental Law Center. The DEA's goal is to ensure that dairy CAFOs operate

in a socially responsible way, to hold the industry accountable, and to educate the public, elected officials, and government regulators about the serious environmental and economic damage being caused by industrial-sized dairies.

The Environmental Integrity Project (EIP) is a nonpartisan, nonprofit organization established in March of 2002 by former EPA enforcement attorneys to advocate for more effective enforcement of environmental laws. EIP's three objectives are to provide an objective analysis of how the failure to enforce or implement environmental laws increases pollution and affects the public's health, to hold federal and state agencies, as well as individual corporations, accountable for failing to enforce or comply with environmental laws, and to help local communities in key states obtain the protection of environmental laws. EIP's enforcement work in the Midwestern United States focuses on greater regulation of air and water pollution from Concentrated Animal Feeding Operations (CAFO's). EIP strives to empower local communities affected by CAFOs and to hold CAFOs accountable for harm to the environment.

Friends of the Earth, Inc. (FoE) is an environmental advocacy organization founded in 1969 and incorporated in the District of Columbia. FoE has offices in Washington, D.C. and San Francisco, C.A., with approximately 30,000 members across the nation. FoE's mission is to protect the planet from environmental degradation; preserve biological, cultural and ethnic diversity, and to empower citizens to affect the quality of their environment and their lives. The health and environmental interests of FoE, and its members, are impacted by the pollution created by concentrated animal feeding operations.

Waterkeeper Alliance (Waterkeeper) is an international nonprofit organization representing the interests of 182 member watershed groups. Waterkeeper, along with each of its member groups, is dedicated to the preservation and protection of waterbodies and

their neighboring communities. Aligned with this mission, Waterkeeper is concerned with the impacts of concentrated animal production on public health and the environment, and it seeks to reduce these impacts by actively advocating for the control of animal waste pollution, reduction of pollution runoff, and promotion of sustainable agriculture.

III. LEGAL BACKGROUND

A. The Clean Air Act

The CAA is the major federal statute regulating air quality and air pollution. The Act was enacted “to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare and the productive capacity of its population.” 42 U.S.C. § 7401(b)(1). The EPA is the agency charged with the Act’s mission and the national leader for the federal air programs and the delegating authority to state programs.

1. Section 111: New Source Performance Standards

In 1970, Congress amended the Act to include nationwide uniform emission standards for categories of stationary sources to complement national ambient air quality standards and prevent new pollution problems. 42 U.S.C. § 7411. Section 111 addresses air pollution problems that endanger public health and welfare, and are common to an industry. Section 111 performance standards apply regardless of a region’s ambient air quality and are triggered when a new source is constructed or an existing source undergoes a major modification. The Act requires the EPA Administrator to set and revise “a list of categories of stationary sources” that “cause[], or contribute[] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.” 42 U.S.C. § 7411(b)(1)(A). Section 111 further requires the Administrator to set standards of performance for new sources in a listed category within one year of listing, 42 U.S.C. §

7411(b)(1)(B), and to prescribe regulations for existing sources in a listed category, 42 U.S.C. § 7411(d). Performance standards under section 111 are to “reflect[] the degree of emission limitation achievable through the application of the best system of emissions reductions which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.” *Lignite Energy Council v. U.S. E.P.A.*, 198 F.3d 930, 932 (C.A.D.C., 1999); 42 U.S.C. § 7411(a)(1).⁸

2. Section 302: Definitions

A stationary source is defined as “any building, structure, facility, or installation which emits or may emit an air pollutant.” 42 U.S.C. § 7411(a)(3). In determining what meets the standard for listing for a category of sources in section 111, the Act defines several terms to guide its decision making. 42 U.S.C. § 7602. An “air pollutant” is broadly defined as “any air pollution agent or combination of such agents, including any physical, chemical, biological...substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant...” 42 U.S.C. § 7602(g). To determine whether a particular air pollutant meets the endangerment standard required by section 111, the Administrator takes into account its effect on public health and welfare. While “public health” is not defined in the CAA, the legislative history defines the term broadly. *See American Lung Ass'n v. E.P.A.*, 134 F.3d 388, 388 (D.C. Cir. 1998). The Act clarifies welfare and states that “[a]ll language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on

⁸ This technology requirement is known as “best demonstrated technology.”

personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants.” 42 U.S.C. § 7602(h). This sweeping definition guides and supports the Administrator’s ability to list and regulate new and existing CAFOs under CAA section 111 as shown herein.

IV. FACTUAL BACKGROUND

There is no dispute that CAFOs produce and emit gases and particulates into the ambient air caused by their intensive animal production, waste storage, and disposal practices. Many of the gases and particulates produced from CAFOs have been incontrovertibly linked to several health and environmental harms. Notable among the effects of these gases and particulates are climate change, risks to human and animal respiratory health, haze, ecosystem acidification and eutrophication, and odors.

A. Climate Change

The role of human activities in climate change is no longer in question.⁹ The Intergovernmental Panel on Climate Change’s (IPCC’s) Fourth Assessment Report established that anthropogenic emissions of greenhouse gases, including methane and nitrous oxide, which are released by CAFOs, are accelerating the warming of the Earth’s atmosphere.¹⁰ Temperature readings taken around the world in recent decades, as well as scientific studies of tree rings, coral reefs, and ice cores, show that average global

⁹ See EPA Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act 74 Fed. Reg. 18886 (April 24, 2009) [hereinafter EPA GHG Endangerment Finding].

¹⁰ Intergovernmental Panel on Climate Change [IPCC], Fourth Assessment Report, Climate Change 2007: Synthesis Report, Summary for Policymakers 2 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf [hereinafter IPCC Synthesis Report].

temperatures have risen substantially since the Industrial Revolution began in the 1750s.¹¹ Of particular concern is the fact that these increases have been accelerating more rapidly since the 1970s.¹² “Global mean surface temperatures have risen by 0.74 °C (1.3 °F) over the last 100 years.”¹³ The IPCC predicts temperature rises of 1.8-4.0°C (3.2-7.2°F) by 2100.¹⁴ These temperature rises are much greater than those seen during the last century when average temperatures rose only 0.06°C (0.12°F) per decade.¹⁵ Since the mid-1970s, however, the rate of increase in temperature rises has tripled.¹⁶ Eight of the ten warmest years ever recorded have all occurred since 2001,¹⁷ and there has been a mean surface temperature increase of 0.6±0.2°C (1.08±0.36°F) in just the last 30 years.¹⁸

These changes in the Earth’s atmosphere are causing significant environmental damage. Worldwide, glaciers are in retreat, the tundra is thawing, sea ice is melting, the sea level is rising, and some species are rapidly disappearing.¹⁹

While climate change is a global issue, the United States in particular will face serious environmental changes. According to the EPA, “North America is projected to warm between 3.6-18 °F (2-10 °C) by 2100, depending on the region” with effects from that

¹¹ *Summary for Policymakers*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERNATIONAL PANEL ON CLIMATE CHANGE 9 (Susan Solomon et al. eds., 2007) [hereinafter IPCC Physical Science Summary], available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>.

¹² See IPCC Synthesis Report at 4.

¹³ Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18895-18896, 18899 (proposed Apr. 24, 2009) (to be codified at 40 CFR Ch. 1) [hereinafter EPA GHG Endangerment Finding].

¹⁴ See IPCC Physical Science Summary 13-14.

¹⁵ U.S. National Oceanic and Atmospheric Administration (NOAA). 2007. NOAA says U.S. winter temperature near average, global December-February temperature warmest on record. Press release (Washington, DC: March 15, 2007), available at <http://www.noaanews.noaa.gov/stories2007/s2819.htm> (last visited May 1, 2009).

¹⁶ *Id.*

¹⁷ EPA GHG Endangerment Finding at 18896.

¹⁸ National Aeronautics and Space Administration Goddard Institute for Space Studies. 2006. 2005 warmest year in over a century, available at www.nasa.gov/vision/earth/environment/2005_warmest.html (last visited May 1, 2009).

¹⁹ IPCC Synthesis Report at 2-9.

increase impacting every region.²⁰ Specifically, the average annual temperatures in the United States are now approximately 1.25°F (0.69°C) warmer than at the turn of the 20th century²¹ and average temperatures are expected to continue to increase.²² The IPCC reports, and the EPA agrees, that the United States will “warm disproportionately” to tropic and subtropic zones as temperatures continue to increase.²³

Not only is the data establishing that global warming and climate change is unequivocal, but the projections for devastating impacts accelerate with each year of documented science. In 2006, top scientists from the National Center for Atmospheric Research estimated that the Arctic sea ice was melting at a rate that will lead to its complete disappearance by 2040.²⁴ In 2007, data from the National Aeronautics and Space Administration (NASA) and National Center for Atmospheric Research caused climate scientists to conclude that the Arctic Ocean would be almost entirely without ice in several decades, with one scientist reviewing his own data and concluding it could be as early as the end of 2012.²⁵

B. The United States Animal Production Industry

A CAFO is an animal feeding operation (AFO) that meets a certain criterion identified by the number of animals kept and raised in confinement. 40 C.F.R. § 122.23(b)(4). These operations, according to EPA, “congregate animals, feed, manure and urine, dead animals, and production operations on a small land area. Feed is brought to the

²⁰ EPA, Climate Change - Health and Environmental Effects: U.S. Regions (Apr. 29, 2009), *available at* <http://www.epa.gov/climatechange/effects/usregions.html#ref> (last visited May 6, 2009).

²¹ EPA GHG Endangerment Finding at 18898.

²² *Id.*

²³ EPA, Climate Change – Health and Environmental Effects, *supra* note 20.

²⁴ J. Stroeve, et. al, *Arctic sea ice decline: Faster than forecast*, GEOPHYS. RES. LETT., May 1, 2007, at 34 see Attach. 1.

²⁵ Seth Borenstein, *Rate of Ice Melt Shocks Warming Experts*, ASSOCIATED PRESS, Dec. 11, 2007, *available at* <http://www.msnbc.msn.com/id/22203980/> (last visited May 6, 2009).

animals rather than the animals grazing or otherwise seeking feed in pastures, fields, or on rangeland.”²⁶ 40 C.F.R. § 122.23 (2003). Because these industrialized, “landless” facilities²⁷ usually produce more manure than can be used as fertilizer on nearby cropland,²⁸ enormous quantities of manure are either stored on-site or disposed onto a small area of land resulting in air pollutant emissions that endanger humans and the environment.²⁹ AFOs produce 500 million tons of manure every year, more than 3.3 times the amount of waste humans in the United States produce each year and the majority of waste from farm animal production.³⁰

EPA reports that in 2006 there were approximately 450,000 AFOs and 18,800 CAFOs in the United States.³¹ While the number of CAFOs may seem comparatively small to the number of AFOs, those CAFOs produce the majority of farm animal products: CAFOs comprise only 5 percent of all AFOs in the United States yet produce more than 50 percent of land-based animals raised for food domestically.³² As recently as 1997, the 2 percent of

²⁶ EPA, *What is a CAFO?* (Feb. 27, 2008), available at <http://www.epa.gov/Region7/water/cafo/index.htm> (last visited May 4, 2009).

²⁷ See generally, Food and Agriculture Organization of the United Nations. Responding to the “Livestock Revolution”—The Case for Livestock Public Policies (2005), available at <ftp://ftp.fao.org/docrep/fao/010/a0260e/a0260e00.pdf>.

²⁸ U.S. EPA Emissions from AFOs at xi.

²⁹ American Public Health Association. 2003. Precautionary moratorium on new concentrated animal feed operations. Policy Number 2003-7. www.apha.org/advocacy/policy/policysearch/default.htm?id=1243.

³⁰ The U.S. Department of Agriculture estimates annual AFO waste production at 500 million tons, while EPA estimates that 150 million tons of waste is generated by the U.S. population each year. See 68 Fed. Reg. 7,176, 7,180 (Feb. 12, 2003) (Final Rule for National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations).

³¹ EPA, *Animal Feeding Operations*, March 19, 2008, available at <http://www.epa.gov/oecaagct/anafoidx.html> (last visited May 1, 2009); see also EPA *Fact Sheet: Concentrated Animal Feeding Operations Proposed Rulemaking*, June 1, 2006, available at http://www.epa.gov/npdes/regulations/cafo_revisedrule_factsheet.pdf.

³² Doug Gurian-Sherman, Union of Concerned Scientists, *CAFOs Uncovered: The Untold Costs of Confined Animal Feeding Operations 2* (2008) [hereinafter UCS Report], available at http://www.ucsusa.org/food_and_agriculture/science_and_impacts/impacts_industrial_agriculture/cafos-uncovered.html, citing M. Ribaud et al., *Manure management for water quality: Costs to animal*

feedlots with more than 1,000 cattle produced 85 percent of the beef sold in the United States.³³ Pig facilities with more than 5,000 animals made up 1.7 percent of the farms but produced over 40 percent of the pigs raised in the United States.³⁴ Similarly, only 11 percent of broiler chicken operations accounted for almost half of the U.S. annual chicken production.³⁵

Over the last two decades, “[s]mall and medium-sized livestock operations have been replaced by large operations at a steady rate.”³⁶ While the number of farms producing animals has greatly declined, the number of animals raised has increased over the past 20 years. From 2002 to 2005, the CAFO industry had a “growth factor of approximately 22 percent due to industry expansion and the trend toward larger, more concentrated facilities.”³⁷

C. CAFOs Produce Air Pollutants

Animal production inherently creates emissions of substances that are considered air pollutants. CAFOs emit more pollutants than traditional, small-scale farms because they raise animals in much larger numbers in smaller spaces. Pollutants from CAFOs are emitted from three primary sources: (1) confinement facilities; (2) manure treatment and

feeding operations of applying nutrients to land, Agricultural economic report no. 824. Economic Research Service, Resource Economics Division, USDA (2003), see Attach. 2 for citing authority.

³³ U.S. EPA Emissions from AFOs at 3-1.

³⁴ U.S. EPA Emissions from AFOs at 5-3 (Table 5-2).

³⁵ *Id.* at 6-2.

³⁶ Robert L. Kellogg, et al., U.S. Dep’t of Agric. (USDA) Natural Res. Conservation Serv., *Manure nutrients relative to the capacity of cropland and pastureland to assimilate nutrients: spatial and temporal trends for the United States* (2000), *available at* <http://www.nal.usda.gov/wqic/manure.shtml>.

³⁷ Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines for Concentrated Animal Feeding Operations in Response to Waterkeeper Decision; Proposed Rule, 71 Fed. Reg. 37744, 37774 (June 30, 2006).

storage systems; and (3) disposal of animal manure.³⁸ Each source emits its own particular combination of pollutants that contribute directly to climate change and other air pollution problems.³⁹

Confinement facilities can range from totally enclosed structures to open unpaved lots. Generally, all animals are confined in enclosed structures with the exception of cattle raised for beef and cows in certain dairy confinement facilities.⁴⁰ While the particular combination of pollutants emitted from a confinement facility depend on the species of animal confined and the manure management system in place, all confinement facilities produce emissions. Confinement facility emissions can include particulates and gases from the animals, feed, flooring, substances emitted directly from the animals, and emissions from waste before it is removed for disposal.⁴¹

Additional air emissions come from manure management systems. Animal waste is stored in solid, slurry, or liquid states depending on the species of animal and the facility's practice.⁴² Waste can be stored in the confinement facility or in a separate covered or uncovered storage area. The way manure is collected, stored, and disposed of dramatically changes the type and intensity of air pollutant emissions from CAFOs. For example, dry manure handling methods increase nitrous oxide and particulate matter emissions, while wet manure methods increase methane and hydrogen sulfide emissions.⁴³ Manure removal

³⁸ U.S. EPA Emissions from AFOs at 2-2; *see also* Iowa State Univ. & the Univ. of Iowa Study Group, Iowa Concentrated Animal Feeding Operations Air Quality Study, Final Report 35-39 (2002), *available at* http://www.ehsrc.uiowa.edu/cafo_air_quality_study.html. at 39 [hereinafter Iowa CAFO Study].

³⁹ U.S. EPA Emissions from AFOs at 2-4, 2-5.

⁴⁰ *Id.* at 2-2-2-3.

⁴¹ *Id.* at 2-1 - 2-3. *See also*, Iowa CAFO Study at 39.

⁴² U.S. EPA Emissions from AFOs at 2-1.

⁴³ Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006 6-8 (2008), *available at* http://www.epa.gov/climatechange/emissions/downloads/08_ES.pdf [hereinafter EPA Inventory of GHGs]; *see also* U.S. EPA Emissions from AFOs at 2-15. In dry manure management systems, manure is typically collected from open lots or enclosed confinement areas and periodically placed in a separate

cycles, which can vary from daily to once per production cycle, also affect emission type and concentration.⁴⁴

Almost all CAFO waste is eventually disposed on land.⁴⁵ Land disposal of manure involves a variety of management practices including: direct application of managed waste (via lagoon or dry storage pile) onto soil surfaces; direct application followed by incorporation into the soil; and injection of managed waste underneath the surface of the soil.⁴⁶ While manure should only be applied at rates consistent with crop nutrient requirements, CAFOs often have such high concentrations of animals that their manure is applied in excess of nutrient requirements and during time periods making crop utilization impossible.⁴⁷ Applying waste in excess of crop nutrient requirements results in higher emissions levels.⁴⁸ Emissions from land disposal occur during two phases: the short-term emissions that occur during the initial application and the long-term emissions that occur as the manure breaks down in the soil. Each land disposal practice substantially affects the type and level of short-term emissions released.⁴⁹

area to dry. Often times this manure removal method is referred to as “scraping.” Wet manure handling methods are often associated with the use of a “flush” system, or when a large volume of water is pumped through the confinement facility and the accumulated manure is discharged into a lagoon for storage. The water used to remove the waste can be fresh or recycled from the lagoon.

⁴⁴ U.S. EPA Emissions from AFOs, 3-9.

⁴⁵ *Id.* at 2-2.

⁴⁶ *Id.* 7-2-7-4.

⁴⁷ *Id.* at 7-1.

⁴⁸ *Id.* at 7-4-7-7.

⁴⁹ *Id.* at 7-4-7-5. Direct application of waste can be handled as solid or liquid waste and is spread by “broadcasting” the waste onto the soil surface by manure spreaders or irrigation. If a facility uses incorporation as its land disposal practice, the waste is plowed or disked into the soil after it is applied onto the soil surface, which results in a reduction in air emissions and odors. Injection, which involves directly injecting manure below the surface of the soil, is a method that provides the least amount of atmospheric exposure and therefore has the lowest rate of short-term emissions.

D. Major Air Emissions from CAFOs

According to the EPA, “air quality problems associated with AFOs are caused by gases emitted from the decomposition of animal wastes and by the dust generated by animal activity and farming practices.”⁵⁰ CAFOs produce a large amount of air emissions with the major substances including: (1) the greenhouse gases methane and nitrous oxide, (2) hydrogen sulfide, (3) ammonia, (4) particulate matter (particulates or PM), and (5) volatile organic compounds (VOCs).⁵¹ Additionally, ammonia, hydrogen sulfide, and VOCs emissions also react with chemicals in the atmosphere that later form fine particulate matter (PM_{2.5}), adding to the amount of particulates produced by CAFOs.⁵² These substances are known to cause and contribute to air pollution problems such as climate change, acid rain, acidification, eutrophication, smog, and limited visibility. These substances cause negative effects on animals, people, and the environment in the vicinity of the CAFO. Also, because the wind carries several CAFO air pollutants hundreds of miles, CAFOs endanger the health of even those humans, animals, and ecosystems far removed from these facilities.⁵³

1. Greenhouse Gases

Methane and nitrous oxide are the predominant greenhouse gases produced by CAFOs. Methane is a greenhouse gas that is created on CAFOs by enteric fermentation in ruminant animals and anaerobic decomposition of organic matter, such as slurries and manure lagoons. Methane is a greenhouse gas that, when produced on CAFOs, is created by

⁵⁰ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176, 7180.

⁵¹ AD HOC COMM. ON AIR EMISSIONS FROM ANIMAL FEEDING OPERATIONS, ET AL., NAT’L RESEARCH COUNCIL, AIR EMISSIONS FROM ANIMAL FEEDING OPERATIONS: CURRENT KNOWLEDGE, FUTURE NEEDS at 50-56 (2003) [hereinafter NRC Air Emissions from AFOs]; see also Iowa CAFO Study at 39.

⁵² NRC Air Emissions from AFOs at 52.

⁵³ See *infra* notes 73 and 156.

enteric fermentation in ruminant animals and anaerobic decomposition of organic matter, such as slurries and manure lagoons.⁵⁴ The global concentrations of methane and nitrous oxide have increased by 149 and 23 percents respectively from pre-industrial levels.⁵⁵ When considered in terms of its 100-year global warming potential, Methane has on the order of 20 times the global warming potential (GWP) of carbon dioxide. Because methane lasts in the atmosphere for only up to 15 years, however, its short-term radiative forcing effect is actually much larger, making near term reductions in this air pollutant significantly helpful in achieving immediate climate benefits.⁵⁶ According to the EPA, “methane absorbs terrestrial infrared radiation that would otherwise escape to space,” which contributes to atmospheric warming.⁵⁷ Methane also contributes to the formation of ground level (bad) ozone and is directly linked to the cooling of the stratosphere, the major cause of stratospheric (good) ozone layer destruction.⁵⁸ Because of the amounts humans are adding to the atmosphere and methane’s short lifetime and significant ability to absorb radiation, The IPCC has determined that methane is the second most dangerous greenhouse gas.⁵⁹

⁵⁴ EPA GHG Inventory at 6-1; EPA Emissions from AFOs at 2-9.

⁵⁵ EPA GHG Endangerment Finding at 18895.

⁵⁶ Please note that all global warming potentials listed in this petition are made on a 100-year timeline. P. Forster, *Changes in Atmospheric Constituents and in Radiative Forcing* in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Susan Solomon et al. eds., 2007) [hereinafter IPCC Climate Report Ch. 2]; See also EPA, Questions and Answers: The Methane to Markets Partnership, October 19, 2006, *available at* <http://www.epa.gov/outreach/qanda.html> (last visited May 1, 2009). The 100-year GWP for methane is derived to be 23 CO₂e by Forster; the EPA GHG Endangerment Finding uses 21 CO₂e as the 100-year GWP for this air pollutant. EPA GHG Endangerment Finding at 18,895. When considered using a 20-year GWP, however, which is more closely aligned with its actual atmospheric residence time, methane has a GWP on the order of 72 times that of CO₂. *Id.* (referencing the IPCC’s analysis).

⁵⁷ EPA, *Methane Science* (Oct. 19, 2006), *available at* <http://www.epa.gov/methane/scientific.html> (last visited May 1, 2009).

⁵⁸ See generally Union of Concerned Scientists, *Explaining Global Warming -- What's Ozone Got To Do With It?* (Nov. 2002), *available at* <http://www.ucsusa.org/assets/documents/ssi/ozone.pdf> (last visited May 4, 2009).

⁵⁹ EPA GHG Endangerment Finding at 18895.

Nitrous oxide is a greenhouse gas released into the ambient air from CAFOs during a bacterial process in decomposing manure. Unlike methane, nitrous oxide is most often emitted from dry conditions, such as unpaved drylots and land disposal sites.⁶⁰ Nitrous oxide is the only major pollutant found on CAFOs that is emitted during both phases of emissions during land disposal.⁶¹ Nitrous oxide has 310 times the global warming potential of carbon dioxide and has an atmospheric lifetime of 120 years.⁶² Nitrous oxide not only affects ozone in the stratosphere in the same way that methane does, but it also breaks down into nitric oxide in the stratosphere, which contributes to ozone destruction in all but the lowest portions of the stratosphere, allowing excess ultra-violet light to strike the Earth's surface and thus increase its warming capabilities.⁶³ Because of these factors, the IPCC deemed nitrous oxide as the third most prevalent greenhouse gas.⁶⁴

2. Hydrogen Sulfide

Hydrogen sulfide is a poisonous, flammable gas that smells like rotten eggs. Hydrogen sulfide emissions from CAFOs most often result from the decomposition of animal manure in wet conditions.⁶⁵ When hydrogen sulfide is emitted as a gas, it can remain in the atmosphere for over four days.⁶⁶ Hydrogen sulfide is one of the principal components of the sulfur cycle that, when released in excess amounts, contributes to the

⁶⁰ U.S. EPA Emissions from AFOs at 2-7.

⁶¹ *Id.* at 7-6-7-7.

⁶² IPCC Climate Report Ch. 2 at 212.

⁶³ Union of Concerned Scientists, Union of Concerned Scientists, Explaining Global Warming, *see supra* 56; *See also* NRC Air Emissions from AFOs at 52.

⁶⁴ IPCC Climate Report Ch. 2 at 144.

⁶⁵ NRC Air Emissions from AFOs at 54-55. *See also* EPA Emissions from AFOs at 2-10.

⁶⁶ Iowa CAFO Study at 88. *See also* Agency for Toxic Substances and Disease Registry, *Public Health Statement for Hydrogen Sulfide* (2004), available at <http://www.atsdr.cdc.gov/toxprofiles/phs114.html> (last visited May 1, 2009).

regional sulfur burden and the formation of PM_{2.5}.⁶⁷ These pollutants can travel for long distances and can contribute to acid rain.⁶⁸ Because of its rotten egg smell at low concentrations, hydrogen sulfide is commonly responsible for the strong odors in areas local to CAFOs.⁶⁹ The National Research Council found CAFO emissions of hydrogen sulfide to have a “significant” effect on the quality of human life on a local basis.⁷⁰

3. Ammonia

Ammonia is a caustic gas with a “pungent” odor that is released by CAFOs during the decomposition of organic nitrogen products such as urea in mammals, uric acid in birds, and proteins in manure.⁷¹ Decomposition can occur in both wet and dry conditions, which means that ammonia is released immediately after excretion and continues to form as the waste breaks down.⁷² The residence time of ammonia in the atmosphere is approximately one week and it can travel up to hundreds of miles throughout a region to impact the environment.⁷³ Ammonia also contributes directly to the creation of PM_{2.5} when it is emitted into the air and joins with sulfur oxides or nitrogen oxides in the atmosphere forming ammonium sulfate or ammonium nitrate, the most abundant form of PM_{2.5} in the San Joaquin Valley Air Basin.⁷⁴ Because of the composition of animal waste, those

⁶⁷ The sulfur cycle is a process where sulfur compounds are released into the air and broken down into other chemicals, eventually to be redeposited back into the soil. *See generally* Environmental Literacy Council, Sulfur Cycle (Oct. 31, 2006), *available at* <http://www.enviroliteracy.org/article.php/1348.html> (last visited May 4, 2009).

⁶⁸ Iowa CAFO Study at 71. See also EPA, *Six Common Air Pollutants: Chief Causes for Concern*, April 8, 2008, *available at* <http://www.epa.gov/air/urbanair/so2/chf1.html> (last visited May 4, 2009).

⁶⁹ NRC Air Emissions from AFOs at 55.

⁷⁰ NRC Air Emissions from AFOs at 72.

⁷¹ U.S. EPA Emissions from AFOs at 2-6; Agency for Toxic Substances and Disease Registry, Medical Management Guidelines for Ammonia (Sept. 24, 2007), *available at* <http://www.atsdr.cdc.gov/mhmi/mmg126.html> (last visited May 4, 2009).

⁷² U.S. EPA Emissions from AFOs at 2-6.

⁷³ Agency for Toxic Substances and Disease Registry, TOXICOLOGICAL PROFILE FOR AMMONIA at 2, *available at* <http://www.atsdr.cdc.gov/toxprofiles/tp126.pdf>; NRC Air Emissions from AFOs at 52.

⁷⁴ *Id.*

compounds are common at CAFO sites.⁷⁵ According to the National Research Council, CAFO emissions of ammonia have a “major” importance in terms of the environmental impact regionally, nationally, and globally.⁷⁶

4. Particulate Matter (PM)

Particulate matter is “composed of small solid and liquid particles suspended in the ambient air” that are categorized by their aerodynamic diameter.⁷⁷ PM can be directly emitted or formed by chemical reactions of other gases in the atmosphere.⁷⁸ PM from CAFOs is comprised of dry manure, bedding and feed materials, biological matter (i.e., animal dander and feathers), unpaved dirt lots, and products of feces and feed decomposition.⁷⁹ CAFOs contribute directly to PM through aspects of the production processes, such as animal activity, facility equipment, and storage and land disposal of manure.⁸⁰ CAFOs contribute indirectly to secondary PM by emitting ammonia, hydrogen sulfide, NO_x, and VOCs which are converted to aerosol particles.⁸¹ NRC found particulates to be a “significant” concern for their effect on local human health and contribution to haze.⁸²

5. Volatile Organic Compounds (VOCs)

Volatile organic compounds (VOCs) are defined by the EPA as “any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical

⁷⁵ Iowa CAFO Study at 37, 40.

⁷⁶ NRC Air Emissions from AFOs at 72.

⁷⁷ EPA, *PM Research* (Aug. 29, 2007), available at <http://www.epa.gov/pmresearch/> (last visited May 4, 2009).

⁷⁸ *Id.*

⁷⁹ U.S. EPA Emissions from AFOs at 2-11; Iowa CAFO Study at 35.

⁸⁰ *Id.*

⁸¹ NRC Air Emissions from AFOs at 55; U.S. EPA Emissions from AFOs at 2-11.

⁸² NRC Air Emissions from AFOs at 72 (Table 3-7).

reactions.” 40 C.F.R. § 51.100(s). VOCs are emitted from CAFOs through feed, fresh waste, enterically, and during the decomposition of manure in both wet and dry conditions.⁸³ CAFOs potentially emit 165 VOCs, and of these, 21 are listed in the CAA as Hazardous Air Pollutants (HAPs).⁸⁴ 42 U.S.C. § 7412(b). Some of the more easily recognized CAFO-emitted VOCs that are also HAPs include benzene, formaldehyde, tetrachloroethylene, methanol, toluene, and xylene.⁸⁵ However, there are a large number of prevalent VOCs released from CAFOs that are not listed as HAPs and would be far more appropriate regulated under section 111. Methane, which is considered a VOC, is not a listed HAP, but a greenhouse gas and an ozone precursor, as described above.

V. DISCUSSION

Section 111 of the Clean Air Act requires the EPA Administrator to list a category of stationary sources if it “causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare,” that is, if the source category meets the statutory “endangerment standard”). 42 U.S.C. § 7411(b)(1)(A). This petition seeks the addition of CAFOs to the list of sources subject to regulation under section 111 because they meet the endangerment standard. In listing CAFOs, the Administrator must use her judgment to determine that the CAFO source category satisfies a two-part test.⁸⁶ First the Administrator must determine, that air pollution of the kind emitted by CAFOs “may reasonably be anticipated to endanger public health or welfare”. 42 U.S.C. § 7411(b)(1)(A). Second, the Administrator must determine that CAFOs cause or contribute significantly to this air pollution. *Id.* It is clear from the factual background above and the discussion below that CAFOs are a stationary source category

⁸³ U.S. EPA Emissions from AFOs at 2-10.

⁸⁴ U.S. EPA Air Emissions from AFOs at Appendix A, A-1 to A-11.

⁸⁵ *Id.*

⁸⁶ EPA GHG Endangerment Finding at 18888 (stating “typically, the endangerment and

within the meaning of section 111, and that the air pollutants emitted by CAFOs contribute significantly to several air pollution problems that endanger public health and welfare.

The Clean Air Act does not require absolute scientific certainty or proof of actual harm when making an endangerment finding. *Massachusetts v. EPA*, 549 U.S. at 506 n.7. Additionally, the Administrator must list CAFOs and promulgate standards of performance if they “*may reasonably be anticipated*” to endanger public health or welfare. 42 U.S.C. § 7411(b)(1)(A). The EPA recognizes that the plain meaning of that phrase should “authorize, if not require, the Administrator to act to prevent harm and to act in conditions of certainty.”⁸⁷ The legislative history behind that language supports the notion that Congress wanted to “assure that regulatory action can effectively prevent harm before it occurs.” See *Lead Indus. Ass’n v. Env’tl. Prot. Agency*, 647 F.2d 1130, 1152, (D.C. Cir. 1980), citing H.R.Rep.No.95-294 at 49 (1977).

A. CAFOs are “Stationary Sources” Within the Meaning of Clean Air Act §111 and EPA Regulations.

Clean Air Act Section 111 defines a “stationary source” as “any building, structure, facility, or installation which emits or may emit an air pollutant.” 42 U.S.C § 7411(a)(3). EPA’s regulations under this provision furthermore clearly describe a CAFO as a “facility” because it uses the word in the regulatory definition of CAFO. 40 C.F.R. § 122.23 App. B (“an animal feeding operation where more than 1,000 'animal units' ... are confined at the *facility*...” (emphasis added)). CAFOs clearly meet the definition of a stationary source therefore, because they are “facilities” under the EPA’s regulatory definition and they emit air pollutants. Furthermore, the EPA has recognized CAFOs as stationary sources in the

EPA GHG Endangerment Finding at 18888 (stating “typically, the endangerment and cause or contribute findings have been proposed concurrently with proposed standards under various sections of the CAA,..... Comment has been taken on these proposed findings as part of the notice and comment process for the emission standards”).

Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District. 68 Fed. Reg. 7330 (Feb. 13, 2003).

B. CAFOs Emit “Air Pollutants” Under the Clean Air Act that Cause and Contribute Significantly to Air Pollution that is Reasonably Anticipated to Endanger Public Health and Welfare

As set forth below, the air pollutants emitted by CAFOs constitute air pollution that endangers health and welfare. First, CAA section 111 is not limited to regulating criteria pollutants and their precursors; the EPA has the authority to promulgate performance standards for pollutants “for which air quality standards have not been issued or which are not included on a list” under section 108(a) or 112(b)(1)(A). 42 U.S.C. § 7411(d). The air pollutants emitted by CAFOs and described in the facts above meet that statutory definition of “air pollutant” under the Act. Specifically, CAFOs emit (1) greenhouse gases that cause or contribute to climate change; (2) hydrogen sulfide that cause or contribute to hydrogen sulfide exposure, localized odors, acid rain, and haze; (3) ammonia that causes or contributes to ammonia exposure, localized odors, ecosystem acidification and eutrophication, and haze; (4) PM and small particulates (PM_{2.5}) that causes or contributes to particle pollution, acid rain, and haze; and (5) certain VOCs that cause or contribute to localized odors, ground-level ozone, and haze.

1. CAFOs Emit “Air Pollutants” Under the Clean Air Act

CAFOs emit these air pollutants in sufficient amounts that they “significantly cause or contribute” to the air pollution endangering public health or welfare, as set forth herein. Therefore there is no reasonable basis for the Administrator to refuse to list CAFOs under section 111, and promulgate performance standards for these air emissions from new and existing CAFOs. 42 U.S.C. §§7411(a), (b), (d).

The CAFO air emissions described in the facts above are air pollutants under the plain language of the statute and the “ordinary, contemporary, common meaning” of the term because they are emitted into the ambient air and are agents of air pollution. *Perrin v. U.S.*, 444 U.S. 37, 42 (1979), citing *Burns v. Alcala*, 420 U.S. 575, 580-581, (1975); *See Consumer Product Safety Commission v. GTE Sylvania, Inc.* 447 U.S. 102, 108 (1980) (“the starting point for interpreting a statute is the language of the statute itself”). The Act defines an “air pollutant” as an

“air pollution agent or combination of such agents, including any physical, chemical, biological...substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant...” 42 U.S.C. § 7602(g).

Courts have generally interpreted the definition of “air pollutant” broadly. *See Alabama Power Co. v. Costle*, 636 F.2d 323, 352 Fn. 60 (D.C. Cir. 1979); *Massachusetts v. Env’tl Prot. Agency* (“*Massachusetts v. EPA*”), 549 U.S. 497, 528 (2007) (Supreme Court characterized definition of “air pollutant” as “sweeping”). When Congress used expansive language in the Clean Air Act’s definition of “air pollutant,” it intended a broad grant of authority to the EPA. *Massachusetts v. EPA*, 549 U.S. at 528. The Court in *Massachusetts v. EPA* stated that “[o]n its face, the definition [of ‘air pollutant’] embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word ‘any.’” *Id.* at 529.

The Coalition is asking the Administrator to look at three categories of pollutants. The first are pollutants that are already recognized under the CAA. The EPA already recognizes PM_{2.5} and many VOCs as air pollutants under the CAA. *See* 40 C.F.R. §§ 50.6-7. Hydrogen sulfide, while not listed under the CAA, has been previously regulated by the EPA under section 111. *See e.g.* 40 C.F.R. § 60.104 (Standards of Performance for

Petroleum Refineries). The second are pollutants that have been named as air pollutants by the EPA under the recent Greenhouse Gas endangerment finding. The EPA's recent broadly scoped Endangerment Finding defines certain greenhouse gases as "air pollutants" and "air pollution" that endangers public health and welfare. The final category of pollutants are not specifically listed under the CAA or section 111, but have long been understood to contribute to ambient air pollution because of emissions from farm animal production sites. At this juncture, the EPA may simply reference to the CAA or existing regulations when the Administrator makes a determination, in response to this petition, that CAFOs cause or contribute significantly to the air pollution from VOCs, PM, or hydrogen sulfide. Similarly, the EPA need only reference the Endangerment Finding when the Administrator makes a determination, in response to this petition that CAFOs cause or contribute significantly to the air pollution described in the Endangerment Finding. For unlisted pollutants, the Coalition requests through this petition a combined contribution, listing, and regulatory action by the Administrator. The Administrator can include her decision to list CAFOs under CAA section 111, and propose section 111 regulations at the same time, or separately.⁸⁸

Furthermore, CAFO emissions comprise a significant contribution to this air pollution. The EPA has read the phrase "cause or contribute" to mean that the Administrator must "consider all sources of exposure to a pollutant (for example, food, water, and air) when determining risk."⁸⁹ AFOs as a whole produce 500 million tons of manure, or *3 times* the amount of waste than humans create, in the United States each

⁸⁶ EPA GHG Endangerment Finding at 18888 (stating "typically, the endangerment and

⁸⁹ EPA GHG Endangerment Finding at 18892, citing H.R. Rep. 95– 294 at 51.

year.⁹⁰ Approximately 18,800 CAFOs are responsible for 47 to 60 percent of that waste.⁹¹ This manure creates an alarming amount of air pollutants that contributes significantly to recognizable air pollution problems such as climate change, acid rain, haze, odors, smog, and harm to human and environmental health due to exposure.⁹²

The major substances emitted by CAFOs plainly meet the sweeping statutory definition of “air pollutant” under section 302(g). While neither the EPA nor the courts have established a standard for determining a “significant contributor” to air pollution, the growing number of CAFOs, the startling amount of waste CAFOs can produce, and the severity of the air pollution problems associated with those pollutants evidences that CAFOs are “significant contributors” to air pollution. *National Asphalt Pavement Association v. Train*, 539 F.2d 775, 784 (D.C. Cir. 1976).

a. Greenhouse Gases

Methane and nitrous oxide are potent greenhouse gases that contribute significantly to global warming and are “air pollutants” under the Clean Air Act. 42 U.S.C. § 7602(g). *Massachusetts v. EPA*, 549 U.S. at 528-529. The EPA agrees that these greenhouse gases “fit well within this capacious definition.”⁹³ Although it is common for the EPA to treat a class of substances with shared characteristics and a similar impact as a single pollutant,⁹⁴ EPA also recognizes that “[i]t is not unusual for a particular source category to emit only a

⁹⁰ National Pollutant Discharge Elimination System permit regulation and effluent limitation guidelines and standards for concentrated animal feeding operations (CAFOs); Final Rule, 68 Fed. Reg. 7176-7180 (Feb. 12, 2003).

⁹¹ *Id.* See also UCS Report at 2, citing M. Aillery, et. al. Managing manure to improve air and water quality; USDA Econ. Research Serv., Report No. ERR9 (2005), *available at* www.ers.usda.gov/publications/ERR9/; see also EPA, Fact sheet: concentrated animal feeding operations proposed rulemaking (June 2006), *available at* www.epa.gov/npdes/regulations/cafo_revisedrule_factsheet.pdf (last visited May 1, 2009).

⁹² See generally, EPA, *Air* (Aug. 27, 2008) *available at* <http://www.epa.gov/ebtpages/air.html> (last visited May 1, 2009); see also Iowa CAFO Study at 45-85.

⁹³ EPA GHG Endangerment Finding at 18893.

⁹⁴ *Id.* at 18904. See generally EPA regulations on particulate matter and VOCs at www.epa.gov.

subset of a class of substances that constitute a single air pollutant.”⁹⁵ CAFOs emit methane and nitrous oxide, two of the six greenhouse gases included in EPA’s Endangerment Finding.

Testing at CAFO sites show that these greenhouse gases are emitted into the ambient air from confinement, manure storage facilities, and manure disposal sites on CAFOs.⁹⁶ The IPCC has determined that methane is the second most important greenhouse gas and nitrous oxide is the third most important greenhouse gas that contributes to climate change.⁹⁷ Methane’s and nitrous oxide’s warming effects in the atmosphere demonstrate that they are “agents” of air pollution that are emitted into the ambient air. 42 U.S.C. § 7602(g). The Supreme Court has found that the scientific evidence leading to this conclusion is undeniable. *See Massachusetts v. EPA*, 549 U.S. at 528. The Court in *Massachusetts v. EPA* stated “[c]arbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt ‘physical [and] chemical...substance[s] which [are] emitted into...the ambient air.’” *Id.* (emphasis added).

Methane and nitrous oxide emissions from CAFOs significantly cause and contribute to global warming. According to the EPA, “the logical starting point for any contribution analysis is a comparison of the emissions of the air pollutant from the...category to the total, global emissions of the...greenhouse gases.”⁹⁸ Worldwide, the animal agriculture sector emits 18 percent of all human-induced greenhouse gas emissions, which is more than

⁹⁵ EPA GHG Endangerment Finding at 18905.

⁹⁶ EPA Emissions from AFOs at 2-9; *see generally* Iowa CAFO Study at 89 for examples of these studies.

⁹⁷ U.S. National Oceanic and Atmospheric Administration, Greenhouse Gases: Frequently Asked Questions, citing IPCC, available at <http://lwf.ncdc.noaa.gov/oa/climate/gases.html> (last visited May 1, 2009).

⁹⁸ EPA GHG Endangerment Finding at 18906. While this statement was in relation to section 202(a) of the Clean Air Act, the legislative history of the Act shows that the language used in 202(a) was contemplated with that of section 111 and other Act endangerment findings. *See id.* at 18891.

even the transport sector.⁹⁹ The Inventory of U.S. Greenhouse Gas Emissions and Sinks estimated that the agricultural sector contributed 6.4 percent of the total U.S. greenhouse gas emissions, more than any sector other than energy.¹⁰⁰

EPA also considers in its contribution analysis a particular greenhouse gas's share of United States emissions of that pollutant. Enteric fermentation from ruminant farm animals and farm animal manure management accounted for over 16 percent of United States nitrous oxide emissions, more than all energy-related nitrous oxide emissions combined.¹⁰¹ These activities also accounted for 27 percent of all United States methane emissions, making animal agriculture the leading source of methane emissions in the United States.¹⁰² In 2006, AFOs were responsible for emitting almost 9 million tons of methane, or almost 185 million tons of carbon dioxide equivalent, in the United States alone.¹⁰³ Furthermore, the land disposal of animal manure is one of the two largest U.S. contributors of nitrous oxide.¹⁰⁴ These emissions are only increasing as the trend towards intensively confining greater numbers of animals in CAFOs continues to grow.¹⁰⁵

Emissions from CAFOs therefore clearly contribute significantly to our nation's total greenhouse gases emissions. Indeed, the 10-percent increase in total domestic nitrous oxide emissions between 1990 and 2006 has been shown to be attributable in part to the poultry industry's shift from liquid manure management systems to dry systems and confinement

⁹⁹ FAO Livestock's Long Shadow at 272.

¹⁰⁰ EPA GHG Inventory at 6-1.

¹⁰¹ *Id.* at 3-1, 6-1. See also Energy Information Administration, *Emissions of Greenhouse Gases Report: Emissions of Nitrous Oxide*, available at <http://www.eia.doe.gov/oiaf/1605/ggrpt/nitrous.html> (last visited May 1, 2009).

¹⁰² *Id.*

¹⁰³ EPA GHG Inventory at ES-13.

¹⁰⁴ *Id.* at ES-10.

¹⁰⁵ U.S. EPA Inventory of GHGs at 6-8. For example, between 1990 and 2006 in the United States, methane emissions from dairy cow and pig manure rose by 49 and 34 percents respectively.

in high-rise houses, as well as the general increase in farmed bird and pig populations.¹⁰⁶ U.S. methane emissions from agriculture increased by over 5 percent between 1990 and 2006, and emissions from animal agriculture constituted the largest percentage of this increase.¹⁰⁷ A 2008 greenhouse gas inventory in Idaho determined dairy and feedlots combined constituted one of the top greenhouse gas emitters responsible for Idaho's 31-percent increase in emissions.¹⁰⁸ These studies clearly demonstrate that CAFOs contribute significantly to the U.S. inventory of greenhouse gas emissions.

b. Hydrogen Sulfide

Hydrogen sulfide meets the definition of an "air pollutant" under the Clean Air Act because it is a toxic gas emitted into the ambient air from confinement sites and liquid manure treatment and storage facilities in CAFOs that contributes significantly to several harmful air pollution problems, including odors, unbalanced sulfur burdens and acid rain. Specifically, CAFOs emit hydrogen sulfide into the ambient air from confinement facilities with manure flushing systems, manure storage tanks, ponds, anaerobic lagoons, and land disposal sites.¹⁰⁹ Hydrogen sulfide emitted from CAFOs is a dangerous substance on its own and causes extreme odor pollution near emissions sites, contributes to regional atmospheric sulfur burdens that cause acid rain, and can contribute to PM_{2.5} formation that causes regional haze.¹¹⁰ The characteristic smell of hydrogen sulfide and its effects on those exposed to it and its ability to bond to other particles to create acid rain and haze make it an agent of these air pollution problems.

¹⁰⁶ U.S. EPA Inventory of GHGs DRAFT (2001) at 6-7.

¹⁰⁷ *Id.* at 6-1.

¹⁰⁸ Randy Strait, et. al., Idaho Greenhouse Gas Inventory and Reference Case Projections 1990-2020, Idaho Department of Environmental Quality iii (2008), *available at* www.deq.state.id.us/air/prog_issues/climate_change/pdfs/ghg_inventory_idaho_sp08.pdf.

¹⁰⁹ U.S. EPA Emissions from AFOs at 2-11.

¹¹⁰ *See* NRC Air Emissions from AFOs at 54-55.

While hydrogen sulfide meets the definition of an air pollutant under the plain meaning of the statute, its status as an air pollutant is also supported by EPA administrative and regulatory decisions.¹¹¹ Furthermore, the EPA has already recognized the need to regulate hydrogen sulfide emissions from industrial sources under section 111. Standards of performance for hydrogen sulfide exist for a variety of sources, including Sulfuric Acid Plants, Petroleum Refineries, Kraft Pulp Mills, Onshore Natural Gas Processing, and Municipal Solid Waste Landfills. See e.g. 40 C.F.R. § 60.104 (Standards of Performance for Petroleum Refineries).

CAFOs contribute significantly to the regional sulfur burdens and formation of PM_{2.5} in areas where CAFOs are abundant or where there are few other sources of sulfur. Similarly, EPA estimates that large dairy and swine AFOs emit 100,000 pounds of hydrogen sulfide annually.¹¹² Emissions from the 2,538 U.S. facilities confining 5,000 or more pigs could reach as much as 50,000 tons of hydrogen sulfide annually.¹¹³ Areas that contain these CAFOs will experience a much greater concentration of hydrogen sulfide regionally.

Generally, areas of the United States that are not exposed to industrial releases of hydrogen sulfide have airborne hydrogen sulfide concentrations of less than 1 part per billion (ppb).¹¹⁴ In areas around Minnesota CAFOs, however, concentrations have been

¹¹¹ See EPA, Animal Feeding Operations Consent Agreement and Final Order; Notice 70 Fed. Reg. 4958, 4959 (Jan. 31, 2005).

¹¹² U.S. EPA, *Non-Water Quality Impact Estimates for Animal Feeding Operations* 2-30 (2002), available at http://www.epa.gov/npdes/pubs/cafo_nonwaterquality.pdf.

¹¹³ USDA, *Farms, Land in Farms, and Livestock Operations 2007 Summary* 31 (2008); USDA, U.S. Summary and States Data, 2002 Census of Agriculture 31 (June 2004) [herein USDA 2002 Census of Agriculture]; National Response Center, Incident Report # 740450, available at http://www.nrc.uscg.mil/reports/rwservlet?standard_web+inc_seq=740450, Incident Report # 743909, available at http://www.nrc.uscg.mil/reports/rwservlet?standard_web+inc_seq=743909.

¹¹⁴ Because hydrogen sulfide is naturally occurring, there are certain ecosystems, such as the Florida wetlands, with higher concentrations.

recorded as high as 50,000 ppb,¹¹⁵ and one study found that the state standard for hydrogen sulfide concentrations were exceeded almost 5 miles away.”¹¹⁶ In another study conducted by the University of Iowa, the dairy CAFO Milk Unlimited exceeded the recommended standard of 15 ppb six times within a single month.¹¹⁷ This shows that the presence of CAFOs in a region significantly affects the amount of hydrogen sulfide in that area, and increases the potential for acid rain and haze.

c. Ammonia

Ammonia meets the definition of an “air pollutant” under the Clean Air Act because it is a caustic gas emitted into the ambient air from any part of the CAFO that has manure present, including all confinement facilities, liquid and dry manure treatment and storage facilities, and all land disposal that is an agent of smog, haze, and ecosystem acidification and eutrophication.¹¹⁸ On its own, ammonia is a dangerous substance with a strong odor that harms human and animal health and causes oxygen depletion and acidification of ecosystems when it is redeposited onto the land or water through precipitation.¹¹⁹

The Clean Air Act includes in its definition of air pollution “any precursors to the formation of any air pollutant...” 42 U.S.C. § 7602(g). Ammonia is a significant precursor to

¹¹⁵ *Hearing Regarding Public Health and Natural Resources: A Review of the Implementation of Our Environmental Laws, Part II Before the Senate Committee on Government Affairs*, (2002) 107th Cong., 2d Sess. (statement of Richard J. Dove, Southeastern Representative, Waterkeeper Alliance), available at <http://www.senate.gov/~govt-aff/031302dove.htm> (referring to a Minnesota study).

¹¹⁶ Robbin Marks, Natural Res. Defense Council and Clean Water Network, *Cesspools of Shame, How Factory Farm Lagoons and Sprayfields Threaten Environmental and Public Health* 18 (2001) available at <http://www.nrdc.org/water/pollution/cesspools/cesspools.pdf> (citing *Feedlot Air Quality Summary: Data Collection, Enforcement and Program Development*, Minnesota Pollution Control Agency 12 (1999)).

¹¹⁷ Appendix B to Letter from Michele Merkel, Senior Counsel, Environmental Integrity Project, to John Peter Suarez, Assistant Administrator, Office of Enforcement and Compliance Assurance 2 (Sept. 2, 2003), available at www.environmentalintegrity.org/pubs/FINAL_CAFO_CAA_letter_to_EPA.ver_2_September_2_2003_.pdf [hereinafter EIP Appendix B].

¹¹⁸ U.S. EPA Emissions from AFOs at 2-6; NRC Air Emissions from AFOs at 52.

¹¹⁹ NRC Air Emissions from AFOs at 52.

PM2.5. Ammonia's chemical structure allows it to rapidly adhere to other particles when it is released into the air, contributing to increased formation of PM2.5, a pollutant already regulated by the Clean Air Act. 40 C.F.R. Pt. 51. In 1995, "ammonia comprised 47 percent of PM2.5 by mass in the eastern United States."¹²⁰ Ammonia therefore not only is an "air pollutant" in its own right, but also can be regulated under the Act as a precursor to PM2.5. 42 U.S.C. § 7602(g).

It is well-established that "ammonia emissions from the livestock sector contribute significantly to eutrophication and acidification of the environment."¹²¹ Animal agriculture produced 80 percent of anthropogenic U.S. ammonia emissions,¹²² or almost 2.5 million tons (5 billion pounds) per year, making livestock agriculture the largest industrial source of ammonia.¹²³ In 2002, the EPA documented almost 2.5 million tons of ammonia from farm animal production.¹²⁴ This is not surprising given that a single dairy CAFO can emit more than 5.5 million pounds of ammonia annually – 75,000 pounds more than the nation's number-one manufacturing source of ammonia air pollution.¹²⁵ The pig producer Premium Standard Farms reported emitting 3 million pounds annually from its Somerset facility

¹²⁰ UCS Report at 55.

¹²¹ NRC Air Emissions from AFOs at 52, 72.

¹²² EPA Nat'l Risk Mgmt Research Laboratory, Review of Emission Factors and Methodologies to Estimate Ammonia Emissions From Animal Waste Handling 1 (2002), *available at* <http://www.epa.gov/ORD/NRMRL/Pubs/600R02017/600R02017.pdf>; *see also*, D. Bruce Harris, et.al., Environmental Protection Agency, Office of Research and Development, Ammonia emissions factors from swine finishing operations 1 (2001) *available at* <http://www.epa.gov/ttn/chief/conference/ei10/ammonia/harris.pdf>.

¹²³ EPA, National Emission Inventory – Ammonia Emissions from Animal Husbandry Operations, Draft Report 1-3 (2004) *available at* http://www.epa.gov/ttn/chief/ap42/ch09/related/nh3inventorydraft_jan2004.pdf

¹²⁴ *Id.* at E-4 (Table E-1).

¹²⁵ *Id.* at 1-3, citing EPA, Toxics Release Inventory (2003), *available at* <http://www.epa.gov/triexplorer/>. In Oregon-based 52,300-cow dairy CAFO Threemile Canyon Farms reported that its emitted 15,500 pounds of ammonia per day, which is 75,000 pounds more than reported by nitrogen and phosphate fertilizer company CF Industries. Nat'l Ass'n of Clean Air Agencies, Comment on CERCLA/EPCRA Administrative Reporting Exemption for Air Releases of Hazardous Substances from Animal Waste 3, *available at* www.4cleanair.org/documents/CAFOLetter32708.pdf.

alone, making it the fifth-largest industrial emitter of ammonia in the country.¹²⁶ While the current rate of ammonia emissions already makes CAFOs a significant contributor to total ammonia air pollution, the EPA estimates that ammonia emissions from AFOs will continue to increase.¹²⁷

d. Particulate Matter

PM_{2.5} and PM₁₀ are already regulated under the CAA because they harm human health and contribute to “ecosystem fertilization, acidification, and eutrophication” as well as haze.¹²⁸ 40 C.F.R. Pts. 50.6-7. According to the EPA CAFOs emit “significant” amounts of PM¹²⁹ no matter what management practices are used or what type of animal confined.¹³⁰ Feedlot cattle emit on the order of 140 million pounds of PM₁₀ alone into the United States each year¹³¹ whereas a *single* poultry CAFO can produce 1.4 million pounds of PM per year;¹³² this is significantly over the 250 tons per year threshold to be considered a major source of PM under the Clean Air Act’s Title V. 42 U.S.C. §§ 7470-7475, 42 U.S.C. §§ 7661(a)-(f). The same poultry company had two other CAFOs at similar levels, suggesting

¹²⁶ Letter from S. William Becker, Executive Director, Nat’l Ass’n of Clean Air Agencies, to The Honorable John D. Dingell, Chairman, Comm. on Energy and Commerce 2 (March 20, 2007) available at <http://www.4cleanair.org/Documents/DingellletterFINALlthd.pdf> (citing Premium Standard Farms, *Air Emissions Monitoring Completion Report* (Nov. 17, 2004) and EPA, Toxics Release Inventory (2004), available at <http://www.epa.gov/triexplorer>).

¹²⁷ EPA, National Emission Inventory *supra* note 121 at E-4 (Table E-1).

¹²⁸ *Id.* See also U.S. EPA Emissions from AFOs at 2-6; NRC Air Emissions from AFOs at 52.

¹²⁹ Dep’t of Justice, Ohio’s Largest Egg Producer Agrees to Dramatic Air Pollution Reductions from Three Giant Facilities (Feb. 23, 2004), available at http://www.usdoj.gov/opa/pr/2004/February/04_enrd_105.htm (last visited May 1, 2009).

¹³⁰ U.S. EPA Emissions from AFOs at 2-12.

¹³¹ *Id.* See also USDA National Agriculture Statistics Service, *Livestock on Feed: National Statistics*, available at <http://www.nass.usda.gov/QuickStats/index2.jsp> (last visited May 1, 2009). The yearly amount of PM₁₀ was made using the CENRAP emissions factors for feedlot cattle on the USDA cattle statistics.

¹³² Michele Merkel, EPA and State Failures to Regulate CAFOs Under Federal Environmental laws: Outline of Remarks Prepared for the National Commission on Industrial Farm Animal Production Meeting 9 (Sept. 11, 2006) available at <http://www.environmentalintegrity.org/pubs/EPA%20and%20State%20Failures%20to%20Regulate%20CAFO's%20Under%20Federal%20Environmental%20Laws.pdf>; Dep’t of Justice, *supra* note 127.

that large laying hen egg operations with similar work practices and technology are likely major sources of particulate matter as well.¹³³

While each farm varies, the one constant in PM emission is that the larger the CAFO and the denser the animal population at the facility, the greater the contribution of PM into the ambient air. For example, the 2002 PM inventory for the Central States Regional Air Planning Association (CENRAP) revealed that CAFOs were one of two sources that comprised over 90 percent of the region's PM emissions.¹³⁴ These numbers alone show how the presence of CAFOs can affect the potential for PM in a region and strongly suggest that CAFOs are significant contributors to PM pollution at levels sufficient to require listing and regulation under section 111.

e. VOCs

VOCs are regulated as precursors to ozone under § 183 of the Clean Air Act. 42 U.S.C. §7511b. Within this regulation, the EPA regulates VOC emissions from 11 categories of stationary sources. *Id.* VOCs are emitted from CAFOs anywhere that manure, feed, and cattle (through enteric emissions) are present. Because of the amount of manure produced on CAFOs, they are significant sources of VOCs.

Areas with high concentrations of CAFOs are perfect illustrations of how this category of sources is a significant contributor to an area's VOC pollution. In 2005, the San Joaquin Valley Unified Air Pollution District (the District), which is an extreme ozone non-attainment area for the 1997 8-hour ozone standard, ranked farm animal waste as its

¹³³ *Id.*

¹³⁴ Bryan M. Penfold, et al., Development of Agricultural Dust Emission Inventories for the Central States Regional Air Planning Association 1-7 (2002), *available at* <http://www.epa.gov/ttn/chief/conference/ei14/session7/reid.pdf>. The total PM emissions from farm animal production in the CENRAP region were estimated to be 51,000 tons per year, with 7,700 tons of PM_{2.5} emissions within this total.

leading source of VOCs — one of the two precursors to ground-level ozone.¹³⁵ 40 C.F.R. § 81.305. According to the Control Officer in the District,

“[e]ven if the very low partial estimates of VOC emissions proposed by dairy industry representatives were correct...emission levels from individual dairies would still be far higher than most other individual sources of air pollution that have been successfully implementing VOC emissions controls for many years.”¹³⁶

Using the District’s emissions factor of 21 pounds of VOCs per cow per year,¹³⁷ the approximately 9 million dairy cows in the United States¹³⁸ could release almost 100,000 tons (200 million pounds) of VOCs per year. Of the 71,510 facilities confining these cows, 595 confine more than 2,000 cows, putting many dairy confinement sites in the San Joaquin Valley over the 10 tons per year threshold for ozone, triggering a “major source” determination under the Clean Air Act New Source Review and Title V permitting requirements.¹³⁹ 42 U.S.C. §§ 7511a(e), 7602, 7661.

Odors are one of the major public complaints about CAFOs and have been linked to the presence of significant levels of VOCs. Like PM, VOCs are present with all types of animals and production methods. In Utah, people in a community north of Circle Four Farm, which houses 57,500 pigs, reported “smelling an offensive hog odor most or all of the time.”¹⁴⁰ A California community bordering Olivera, a 700,000-bird facility, complain of the

¹³⁵ U.S. EPA, Ground Level Ozone (Jan. 16 2009), *available at* <http://www.epa.gov/air/ozonepollution/> (last visited May 6, 2009).

¹³⁶ San Joaquin Valley Unified Air Pollution Control District, Air Pollution Control Officer’s Determination of VOC Emission Factors for Dairies at 2 (2005), *available at* <http://www.4cleanair.org/Documents/APCODetermination.pdf>.

¹³⁷ *Id.*

¹³⁸ USDA 2002 Census of Agriculture at 22.

¹³⁹ U.S. Dep’t of Agriculture, Farms, Land in Farms, and Livestock Operations 2007 Summary, Agricultural Statistics Board (Feb.) 2008 at 22, *available at* <http://usda.mannlib.cornell.edu/usda/nass/FarmLandIn//2000s/2007/FarmLandIn-02-02-2007.pdf>.

¹⁴⁰ EIP Appendix B at 6.

inability to spend time outdoors or keep their windows open because of the smell.¹⁴¹ In a four-month period, the Iowa State Department of Agriculture received 775 complaints about odor from dairy operations, often concerning the area's largest dairy facilities.¹⁴² The presence of VOCs from CAFOs has also been linked to a significant increase in a region's PM.¹⁴³ These factors make CAFOs a significant source of these air pollution problems, particularly in areas with a high density of CAFOs.

2. Air Pollution from CAFOs is Reasonably Anticipated to Endanger Public Health and Welfare

As discussed above, the major pollutants emitted from CAFOs have been found to significantly cause or contribute to serious air pollution problems such as climate change, ground level ozone, and acid rain. Pursuant to the requirements of section 111 of the Clean Air Act, CAFOs must be listed as a category of sources because these air pollution problems endanger public health and welfare. 42 U.S.C. § 7411(b)(1)(A). The EPA has acknowledged that the “growing scale and concentration of AFOs has contributed to negative environmental and human health impacts.”¹⁴⁴ Even if there are more opportunities for research linking negative health and environmental impacts with CAFOs, the CAA does not require absolute scientific certainty or proof of actual harm when making an endangerment finding. *Massachusetts v. EPA*, 549 U.S. at 506 n.7. The Administrator must list CAFOs and promulgate standards of performance if they “*may reasonably be anticipated*” to endanger public health or welfare. 42 U.S.C. § 7411(b)(1)(A). The EPA recognizes that the plain meaning of that phrase should “authorize, if not require, the

¹⁴¹ *Avila, et. al v. Olivera Egg Ranch, LLC*, Notice of Intent to Sue, Jul. 23, 2008. On file with The Humane Society of the United States, see Attach. 3.

¹⁴² EIP Appendix B at 9.

¹⁴³ EPA, *Green Book: Criteria Pollutants*, available at <http://www.epa.gov/oar/oaqps/greenbk/o3co.html>.

¹⁴⁴ EPA, *Animal Waste: What's the Problem?*, July 2, 2007, available at <http://www.epa.gov/region09/animalwaste/problem.html> (last visited on May 1, 2009).

Administrator to act to prevent harm and to act in conditions of certainty.”¹⁴⁵ The legislative history behind that language supports the notion that Congress wanted to “assure that regulatory action can effectively prevent harm before it occurs.” See *Lead Indus. Ass’n v. Env’tl. Prot. Agency*, 647 F.2d 1130, 1152, (D.C. Cir. 1980), citing H.R.Rep.No.95-294 at 49 (1977).

The harm caused by air pollution from CAFOs is already occurring; health and environmental impacts from CAFO pollutants are well-documented. There are currently over 70 published studies linking air emissions from CAFOs to harm to public health and welfare.¹⁴⁶ There are even more studies and documentation focused on the danger of exposure to individual pollutants listed in this petition. The Supreme Court found that the EPA cannot refuse to regulate “by noting the uncertainty surrounding various features” of air pollution. *Massachusetts v. EPA*, 549 U.S. at 534. There is more than enough scientific evidence to support the claim that emissions from CAFOs clearly meet the endangerment standard.

As early as 1998, the U.S. Centers for Disease Control and Prevention stated that airborne emissions from CAFOs “constitute a public health problem” on a local, regional, and national scale¹⁴⁷ and the EPA documents specific health risks associated with exposure to CAFO emissions.¹⁴⁸ There are studies documenting instances of psychological and neurological illness¹⁴⁹, health problems, and even death caused by exposure to emissions

¹⁴⁵ EPA GHG Endangerment Finding at 18891.

¹⁴⁶ Kelly J. Donham, et al., *Community Health and Socioeconomic Issues Surrounding Concentrated Animal Feeding Operations*, 115 ENVTL HEALTH PERSP 2, 317-20 (Feb. 2007), available at <http://www.ehponline.org/members/2006/8836/8836.html>.

¹⁴⁷ Kendall M. Thu, Nat’l Agric. Safety Database, Neighbor Health and Large-scale Swine Production <http://www.cdc.gov/nasd/docs/d001701-d001800/d001764/d001764.pdf>.

¹⁴⁸ EPA, *Animal Waste: What’s the Problem?* (July 2, 2007), available at <http://www.epa.gov/region09/animalwaste/problem.html> (last visited May 1, 2009).

¹⁴⁹ *Id.*

from CAFOs.¹⁵⁰ The EPA includes “respiratory illness, lung inflammation, and increase[d] vulnerability to respiratory diseases, such as asthma” among the effects CAFO emissions can have on human health.¹⁵¹ Within the facilities, up to 70 percent of CAFO workers have documented serious respiratory problems,¹⁵² and similar health problems have been documented in areas surrounding CAFOs.¹⁵³ Children and teenagers who attend school near CAFOs may be at higher risk for asthma symptoms.¹⁵⁴ Increasing industrial animal production corresponds with an increase in local infant mortality rates: doubling animal production in a county increases infant mortality by 7.4 percent.¹⁵⁵ Clearly these substances can harm and even kill people who come in contact with them and, because most of these substances do not immediately break down in the atmosphere, their effects can spread for hundreds of miles.¹⁵⁶

EPA itself has acknowledged that air emissions, including odors, from CAFOs can affect public welfare.¹⁵⁷ A number of studies have found that CAFO emissions are linked

¹⁵⁰ U.S. Dep’t of Labor, Occupational Safety & Health Admin., Accident Investigation Search, available at <http://www.osha.gov/pls/imis/accidentsearch.html> (last visited May 1, 2009).

¹⁵¹ EPA, *Animal Waste: What’s the Problem?*, July 2, 2007, available at <http://www.epa.gov/region09/animalwaste/problem.html> (last visited May 1, 2009).

¹⁵² Iowa CAFO Study at 133-134.

¹⁵³ Iowa CAFO Study at 137. Note that similar populations that were not located near CAFOs did not demonstrate these symptoms on comparable levels.

¹⁵⁴ See Sigurdur T. Sigurdarson and Joel N. Kline, *School Proximity to Concentrated Animal Feeding Operations and Prevalence of Asthma in Students*, 129 CHEST 1, 1486-1491 (2006), available at <http://www.chestjournal.org/cgi/content/full/129/6/1486>; see also Maria C. Mirabelli, et al., *Asthma Symptoms Among Adolescents Who Attend Public Schools That Are Located Near Confined Swine Feeding Operations*, 18 PEDIATRICS 1, e66-e75 (July 2006), available at <http://pediatrics.aappublications.org/cgi/content/full/118/1/e66>.

¹⁵⁵ Stacy Sneeringer, *Does Animal Feeding Operation Pollution Hurt Public Health? A National Longitudinal Study of Health Externalities Identified by Geographic Shifts in Livestock Production* 124 (February 2009) Amer. J. Agr. Econ. 91(1).

¹⁵⁶ Agency for Toxic Substances and Disease Registry. 1999. Toxicological profile for hydrogen sulfide. Atlanta: US Department of Health and Human Services, available at <http://www.atsdr.cdc.gov/toxprofiles/tp114.pdf> (last visited May 5, 2009); see also Iowa CAFO Study at 123.

¹⁵⁷ EPA, *Animal Feeding Operations Consent Agreement and Final Order*; Notice 70 Fed. Reg. 4958, 4959 (Jan. 31, 2005).

with declines in community, quality of life, and economic stability.¹⁵⁸ CAFOs also have acute and chronic effects on farm animals' health and well-being.¹⁵⁹ A "preponderance of scientific studies on the effects of air contaminants and emissions on animal health has been conducted."¹⁶⁰ In addition to affects on farm animals, CAFOs can affect wildlife habitat and the ability for people to enjoy wildlife. Several of the major air pollutants created at CAFOs contribute to haze and smog, which affects visibility in scenic areas and causes acidification and eutrophication of wildlife habitats.¹⁶¹

While evidence shows that CAFOs as a whole pose a risk to human health and welfare, each of the major emissions from CAFOs meets the endangerment standard as well. Regulating each of these emissions will not only reduce risks to human health caused by CAFOs, but will also reduce risks to health from air pollution problems to which CAFO emissions contribute.

a. CAFO Emissions of Greenhouse Gases Endanger Public Health and Welfare

The greenhouse gas emissions from CAFOs are associated with the gases contributing to increased temperatures on the Earth that are endangering public health and welfare. The Supreme Court found that the "harms associated with climate change are serious and well recognized." *Massachusetts v. EPA*, 549 U.S. at 521. EPA's recent Endangerment Finding includes six greenhouse gases, including methane and nitrous oxide, the two major greenhouse gases emitted by CAFOs.¹⁶² While the Endangerment Finding explains in detail the ways that climate change is already harming our public health and welfare and "virtually every facet of the living world," this petition describes

¹⁵⁸ Iowa CAFO Study at 147-160.

¹⁵⁹ *Id.* at 115-120.

¹⁶⁰ *Id.* at 42.

¹⁶¹ *Id.* at 116-117.

¹⁶² See generally EPA GHG Endangerment Finding.

some of the major effects of climate change that are caused or contributed significantly to by CAFO air emissions, and that impact Coalition members.¹⁶³

(1) Harm to Public Health

Harms come from primary and secondary sources – the increase in temperature will directly harm populations sensitive to heat-related illness in the United States while the secondary effects of climate change, such as increase of extreme weather and rising sea levels, will continue to harm public health.¹⁶⁴ In addition to contributing to the obvious dangers of global warming, exposure to methane has been known to cause acute health problems consistent with the effects of depleted oxygen and many instances of death.¹⁶⁵

Greenhouse gas emissions, including emissions of methane and nitrous oxides by domestic CAFOs, directly endangers human health and welfare in the United States by increasing annual heat-related morbidity and mortality. There have been widespread changes in extreme temperatures over the last 50 years.¹⁶⁶ Every area of the United States is projected to experience an increase in heatwaves, with the greatest increases in the

¹⁶³ *Id.* at 18904.

¹⁶⁴ IPCC Physical Science Summary at 13. An 18 to 58 centimeter rise in sea level for the 21st century, a rate that does not take into account the acceleration of ice sheet loss, would have devastating impacts on natural features, densely populated coastal communities, and fresh-water supplies.

¹⁶⁵ Since the 1970s, there are dozens of documented instances of death among CAFO workers and their families as a result of inhalation of methane gas from manure pits, including five people dying from methane exposure as recently as July 2007. *Hearing Regarding An Examination of the Potential Human Health, Water Quality, and Other Impacts of the Confined Animal Feeding Operation Industry Before the Senate Environment and Public Works Committee* (2007) 110th Cong. 2d Sess. (statement of Catharine Fitzsimmons, Chief, Air Quality Bureau Iowa Department of Natural Resources, National Association of Clean Air Agencies), *available at* http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=73afc323-c44d-4fff-915e-d4657b05167a; U.S. Dep't of Labor, Occupational Safety & Health Administration, Safety and Health Topics: Methane, *available at* http://www.osha.gov/dts/chemicalsampling/data/CH_250700.html (last visited May 5, 2009).

¹⁶⁶ EPA GHG Endangerment Finding at 18898.

western, upper midwestern,¹⁶⁷ northeastern, and southern regions.¹⁶⁸ The IPCC reports that 12 United States cities have increased hospital admissions for cardiovascular disease that had been exacerbated by hot temperatures.¹⁶⁹ Between 1979 and 1999, a time period including the 10 warmest years on record,¹⁷⁰ 8,015 heat-related deaths occurred in the United States.¹⁷¹

Increased temperatures also endanger public health by creating and expanding environments where diseases can thrive. Rift Valley fever, for example, reemerged in Kenya in late 2006, reportedly infecting 684 people, of whom 155 died.¹⁷² Increased algae-growth due to increased sea-temperatures caused a cholera outbreak in Latin America. The IPCC estimates that the U.S. is now at risk for increased levels of cholera. In December of 2007, the first tropical virus, dengue fever, was found in Italy.¹⁷³ This outbreak, affecting nearly 300 people, was the first example in modern Europe of a vector-born disease that had previously only been seen in the tropics.¹⁷⁴ The reason for the spread was that climate change had created conditions that made it possible for diseases to exist

¹⁶⁷ Kristie L. Ebi and Gerald A. Meehl, Pew Center on Global Climate Change, *Heat Waves & Global Climate Change, The Heat is On: Climate Change & Heatwaves in the Midwest* 7 (2007), available at <http://www.pewclimate.org/docUploads/Regional-Impacts-Midwest.pdf>. This study of midwestern cities showed a 21 to 50-percent increase in heatwaves over this century.

¹⁶⁸ *Id.* at 5.

¹⁶⁹ IPCC Working Group II Report Ch. 14 at 625.

¹⁷⁰ World Meteorological Organization, *WMO statement on the status of the global climate in 2007*, available at http://www.wmo.int/pages/prog/wcp/wcdmp/documents/WMO1031_EN_web.pdf (last visited May 1, 2009).

¹⁷¹ Ebi and Meehl, *Heat Waves and Climate Change* at 5, *supra* note 165.

¹⁷² The Humane Society of the U.S., *An HSUS Report: The Impact of Animal Agriculture on Global Warming and Climate Change* 12, available at http://www.hsus.org/archive/campaigns/temp/global_warming_animal_ag.html.

¹⁷³ Maria Cheng, *Fever Outbreak in Italy Linked to Climate Change*, November 29, 2007, National Geographic News, available at <http://news.nationalgeographic.com/news/2007/11/071129-AP-europe-fever.html> (last visited May 1, 2009).

¹⁷⁴ *Id.*

where they could not previously.¹⁷⁵ The famous West Nile virus outbreak in the U.S. was also linked to above average temperatures.¹⁷⁶ The 0.7 degrees Celsius increase in sea-temperature has increased the growth of toxic algae which causes shell-fish poisoning.¹⁷⁷ Consumption of contaminated shellfish not only endangers humans but also sea-mammals and bird populations. The EPA has also suggested that there will likely be an increase in food-borne pathogens such as Salmonella,¹⁷⁸ which has been long associated with factory farming, because of climate change.¹⁷⁹

Native Inupiat coastal villages in the Arctic are in imminent danger of destruction because of the severe loss of land-fast sea ice. EPA has acknowledged this imminent threat, not just to their communities, but to their way of life. "Climate change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental changes from sea ice loss and coastal erosion that threaten traditional ways of life."¹⁸⁰

IPCC and National Oceanic and Atmospheric Administration (NOAA) research demonstrates that warmer temperatures will increase the incidence of extreme weather

¹⁷⁵ Elisabeth Rosenthal, *As Earth Warms Up, Tropical Virus Moves to Italy*, N.Y. Times, Dec. 23, 2007, available at <http://www.nytimes.com/2007/12/23/world/europe/23virus.html> (last visited May 1, 2009).

¹⁷⁶ See generally Jonathan E. Soverow et al., *Infectious Disease in a Warming World: How Weather Influenced West Nile Virus in the United States (2001-2005)*, 117 ENVTL HEALTH PERSP. 5, (May 2009) available at <http://www.ehponline.org/docs/2009/0800487/abstract.html>.

¹⁷⁷ *Id.*

¹⁷⁸ See An HSUS Report: The Impact of Industrialized Animal Agriculture on the Environment, available at http://www.hsus.org/farm/resources/research/enviro/industrial_animal_ag_environment.html.

¹⁷⁹ EPA GHG Endangerment Finding at 18901.

¹⁸⁰ *Id.* at 18903-4.

events that can cause severe damage and loss of lives.¹⁸¹ There were 232 tornadoes in the United States in February 2008, almost triple the previous 1971 record of 83.¹⁸²

In addition to contributing to the obvious dangers of global warming, methane has been known to cause acute health problems consistent with the effects of depleted oxygen and even death.¹⁸³

(2) Harms to Natural Resources

In its recent Endangerment Finding, EPA recognizes that climate change is “already affecting U.S. water resources, agriculture, [and] land resources.”¹⁸⁴ Degradation caused by climate change, including desertification, drought, and deforestation, directly impact on global food sovereignty. This assessment is confirmed by the United Nations’ World Food Program, the Food and Agriculture Organization, and the International Fund for Agricultural Development; in December 2007 Jacques Diouf, FAO Director General stated that “[i]f we do not act now, climate change will increase the number of hungry people in the world.”¹⁸⁵ Global agricultural markets link specific impacts of climate change in one country to the ability of families across the globe to feed themselves. For example, increased global grain prices during the spring of 2008 were in part a response to decreased wheat

¹⁸¹ IPCC Working Group II Report Ch. 14 at 619; *see generally* Department of Commerce, NOAA’s National Climatic Data Center, CCSP, 2008: Weather and Climate Extremes in a Changing Climate. Regions of Focus: North America, Hawaii, Caribbean, and U.S. Pacific Islands. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research.

¹⁸² National Oceanic and Atmospheric Administration’s National Weather Service, *Storm Prediction Center*, April 14, 2008, <http://www.spc.noaa.gov/climo/torn/monthlytornstats.html> (last visited May 5, 2009).

¹⁸³ U.S. Dep’t of Labor, Occupational Safety & Health Administration, *Safety and Health Topics: Methane*, available at http://www.osha.gov/dts/chemicalsampling/data/CH_250700.html (last visited May 5, 2009).

¹⁸⁴ EPA GHG Endangerment Finding at 18899.

¹⁸⁵ World Food Program, *UN food agencies urge climate action to avert hunger*, News Release, (Dec. 12, 2007), available at <http://www.wfp.org/news/news-release/un-food-agencies-urge-climate-change-action-avert-hunger> (last visited May 5, 2009).

production from drought plagued Australia,¹⁸⁶ and recent research links this prolonged drought to global warming.¹⁸⁷

The relationship between warming temperatures and increased soil carbon loss is well documented. Rising temperatures accelerate microbial decomposition of Soil Organic Compounds (SOCs), which enhance the release of carbon from soil into the atmosphere.¹⁸⁸ This creates a dangerous feedback loop, where increased temperatures increase carbon in the atmosphere, which again result in increased temperatures. While there is not consensus on exactly how much carbon is lost from the soil while temperatures rise, these discrepancies are likely to occur as a result of varying models on carbon soil.¹⁸⁹ A new study by scientists at the University of Toronto Scarborough found that increased warming could increase cuticular carbon in soil while decreasing other types of carbon retained in the soil. This change in the types of carbon retained in soil, particularly the loss of certain types of soil carbon, reduces the microbial activity in soil. Cuticular carbon cannot be used by soil microbes in the same way other types of carbon can. Reduced microbial activity has an adverse impact on soil fertility, reduces the ability for soil to retain water, and enhances soil erosion (which leads to desertification), all of which could have drastic impacts on agriculture and food production.¹⁹⁰

¹⁸⁶ Keith Bradshere, *A Drought in Australia, a global shortage of Rice*, N.Y. Times, Apr. 17, 2008, available at <http://www.nytimes.com/2008/04/17/business/worldbusiness/17warm.html?ref=science>, (last visited May 5, 2009).

¹⁸⁷ David Fogarty, *Global warming 37 pct to blame for droughts-scientist*, Reuters, Singapore, Mar., 24, 2009, available at <http://www.reuters.com/article/latestCrisis/idUSSP141565> (last visited May 5, 2009).

¹⁸⁸ See for example recent research conducted by a joint research group of the Japan Atomic Energy Agency (JAEA) and the Forestry and Forest Products Research Institute (FFPRI). For more information, please visit <http://www.jaea.go.jp/english/news/p081120/index.shtml>

¹⁸⁹ Chris Jones, et al. Global climate change and soil carbon stocks; predictions from two contrasting models for the turnover of organic carbon in soil, *Global Change Biology*, Vol. 11 No. 1 154 – 166 (2004), see Attach. 4.

¹⁹⁰ Xiaojuan Feng, et al., *Increased cuticular carbon sequestration and lignin oxidation in response to soil warming*, NATURE GEOSCIENCE Vol. 1 836 - 839 (2008), see Attach. 5.

While climate change may be reducing soil's ability to retain water and increasing erosion, it is also contributing to changes in precipitation resulting in increasing drought and desertification in some regions.¹⁹¹ Water is already a precious commodity, and changes in precipitation are already having a severe impact on the United States and communities around the world.¹⁹² Former Secretary-General of the United Nations, Kofi Annan, noted in 2001 that drought and desertification threaten the livelihoods of over 1 billion people in more than 110 countries around the world.¹⁹³ New research from Melbourne University found that 37 percent of droughts across the globe occurring over the last 15 years result from global warming.¹⁹⁴ The study's conductor, Peter Baines, studied global rainfall patterns and used temperature data going as far back as 1910.¹⁹⁵ The study noted that four regions of the world have already experienced decreased rainfall, including the United States and Australia.¹⁹⁶

Climate change is a major factor in forest loss. One recent study found that forests in the Pacific Northwest are dying twice as fast as they were 17 years ago.¹⁹⁷ The study found that old growth trees were dying at a quickened pace as a result in changing water availability associated with climate change.¹⁹⁸ A 2008 U.S. Climate Change Science Program (CCSP) report observed that "[t]he number and frequency of forest fires and insect

¹⁹¹ See EPA GHG Endangerment Finding at 18899.

¹⁹² See *id.*

¹⁹³ Message by the Secretary-General Kofi Annan, U.N. Convention to Combat Desertification, In Message on World Day to Combat Desertification, Warns Livelihood of 1 Billion People in 110 Countries Threatened (June 7, 2001), *available at* <http://www.unccd.int/publicinfo/june17/2001/anan2001.php?noMenus=1> (last visited May 7, 2009).

¹⁹⁴ David Fogarty, *Global warming 37 pct to blame for droughts-scientist*, REUTERS, Singapore, Mar. 24, 2009, *available at* <http://www.reuters.com/article/latestCrisis/idUSSP141565> (last visited May 1, 2009).

¹⁹⁵ See *generally id.*

¹⁹⁶ See *id.*

¹⁹⁷ Peter N. Spotts, *US Forests hold new evidence of global warming: Scientists see a trend in longer dry spells and winter snowpacks melting earlier than in the past*, THE CHRISTIAN SCI. MONITOR, Jan. 22, 2009, *available at* <http://features.csmonitor.com/environment/2009/01/22/us-forests-hold-new-evidence-of-global-warming/> (last visited May 1, 2009).

¹⁹⁸ See *id.*

outbreaks are increasing in the interior West, the Southwest, and Alaska.”¹⁹⁹ Warmer temperatures have contributed to “economically significant losses” in the forest resources in Alaska.²⁰⁰ Over half of the 1.2 million tribal members in the United States have been forced to alter their traditional ways of life and economic activities because of the loss of natural resources due to warmer temperatures.²⁰¹ Similarly, many rural communities that depend heavily on fishing and forestry have suffered because of the decrease in those resources.

(3) Oceanic Harms

Increased atmospheric and ocean surface temperatures harm public health and welfare. In February 2008, the Alaska Native Village of Kivalina, brought a suit because their village was eroding into the Arctic Sea due to melting sea ice. *See Native Village of Kivalina, et al. v. ExxonMobil Corp., et al.*, No. 08-1138 (N.D. Cal. Feb. 26, 2008).²⁰² Relocation is estimated to cost approximately \$400 million. *Id.* In 2005, near Indonesia, the Carterets people became the first to be officially evacuated because of climate change due to rising sea levels destroying their island homes and farms.²⁰³ Harms to communities reliant on the oceans are also evident in the loss of biodiversity due to increased temperatures. Coral bleaching is particularly problematic because reefs are the most diverse oceanic ecosystem and are habitat to more than a quarter of marine life.²⁰⁴ “[N]early 500 million people depend on healthy coral reefs for sustenance, coastal protection, renewable

¹⁹⁹ EPA GHG Endangerment Finding at 18899 citing Backlund, P., A. Janetos, et al. Executive Summary. In: *The effects of climate change on agriculture, land resources, water resources, and biodiversity in the United States*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research.(2008).

²⁰⁰ *Id.*; see also IPCC Working Group II Report Ch. 14 at 624.

²⁰¹ IPCC Working Group II Report Ch. 14 at 625.

²⁰² See also EPA GHG Endangerment Finding at 18903.

²⁰³ John Vidal, *The First Climate Change Refuges*, THE GUARDIAN, Dec. 2 2005, available at <http://www.guardian.co.uk/theguardian/2005/dec/02/guardianweekly.guardianweekly11> (last visited May 1, 2009).

²⁰⁴ *Id.*

resources, and tourism, with an estimated 30 million of the world's poorest people depending entirely on the reefs for food.”²⁰⁵ The Pew Center on Global Climate Change reported two studies that estimated reef-related economic contributions to four Florida counties were \$4.3 billion in sales and \$2 billion in annual income, and Hawaiian reefs provide an estimated annual benefit of \$363 million.²⁰⁶

Rising sea-temperature also harms aquatic habitats: more than 75 percent of major fish habitats will be affected,²⁰⁷ including a projected 80-100 percent annual bleaching of the world's coral reefs by 2080.²⁰⁸ There have been at least six mass coral bleaching events since 1982 because of increase sea-surface temperatures, resulting in a devastating loss of the world's coral reefs.²⁰⁹ Coral bleaching is “incontrovertibly linked” to an increase in sea surface temperatures.²¹⁰

In addition to increasing temperatures and extreme weather events, another great danger to public welfare is rising sea levels. A 16-inch rise in sea level per century, a rate that is currently being exceeded, would have devastating impacts on natural features, densely-populated coastal communities, and fresh-water supplies. An NRC report stated

²⁰⁵ United Nations Educational, Scientific, and Cultural Organization, *Caribbean coral reefs threatened IOC-UNESCO publication sounds the alarm*, Jan. 28, 2008, available at <http://portal.unesco.org/en/ev.php> (last visited May 1, 2009)-URL_ID=41718&URL_DO=DO_TOPIC&URL_SECTION=201.html (last visited May 1, 2009).

²⁰⁶ Robert W. Buddemeier, et al., Pew Center on Global Climate Change, *Coral Reefs and Global Climate Change: Potential Contributions of Climate Change to Stresses on Coral Reef Ecosystems* 30 (2004), available at http://www.pewclimate.org/docUploads/Coral_Reefs.pdf.

²⁰⁷ Christian Nellemann, et al., United Nations Environment Programme, *Rapid Response Assessment: In Dead Water – Merging Climate Change with Pollution, Over-Harvest, and Infestations in the World's Fishing Grounds* 8-9 (2008) [hereinafter *UNEP Fishing Grounds Assessment*], available at <http://www.grida.no/publications/rr/in-dead-water/>; see also Andrew Revkin, *Oceans' Unfruitful Stretches Multiplying*, N.Y. TIMES, Mar. 6, 2008, available at http://www.nytimes.com/2008/03/06/us/06brfs-OCEANS8217UN_BRF.html (last visited May 7, 2009).

²⁰⁸ UNEP Fishing Grounds Assessment at 7.

²⁰⁹ R.J. Nicholls, et al., *Coastal systems and low-lying areas* in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY. CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 321 (2007), available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter6.pdf>.

²¹⁰ IPCC Working Group II Report Ch. 4 at 235.

that “[p]otentially, the greatest impact of climate change for North America’s transportation systems will be flooding of coastal roads, railways, transit systems, and runways because of global rising sea levels.”²¹¹ At present, 60,000 miles of coastal highways are subject to periodic flooding.²¹² Infrastructure such as drinking water and waste water treatment plants, sewer and stormwater management systems, airports, bridges, pipelines, communication lines, and power lines are all at risk for flooding and damage.²¹³ Of the \$19 trillion value of insured U.S. property exposed to North Atlantic hurricanes, properties worth \$7.2 trillion are located in coastal areas.²¹⁴

(4) Harms to the Animals and Land Habitats

Every region in the United States is expected to suffer a loss to its local ecosystems.²¹⁵ If the warming trend continues, 15 to 37 percent of global plant and animal species will be extinct by 2050 because of their inability to adapt to or tolerate the increased temperatures.²¹⁶ A 2008 report on bird populations by the International Union for the Conservation of Nature warned that climate change accelerates the factors “which have put one in eight of the world’s birds at risk of extinction.”²¹⁷ Increased temperature will also

²¹¹Nat’l Res. Council, Transp. Res. Bd., Potential Impacts of Climate Change on U.S. Transportation 146 (2008), *available at* <http://onlinepubs.trb.org/onlinepubs/sr/sr290.pdf>.

²¹² *Id.* at 61.

²¹³ See EPA GHG Endangerment Finding at 18902; *see generally* National Research Council *supra* note 208.

²¹⁴ IPCC Working Group II Report Ch. 14 at 626.

²¹⁵ See generally, EPA, CCSP, Preliminary review of adaptation options for climate-sensitive ecosystems and resources. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research (2008) [hereinafter the U.S. CCSP Review], *available at* <http://www.climatechange.gov/Library/sap/sap4-4/final-report/>.

²¹⁶ IPCC Working Group II Report Ch. 4 at 241; IPCC Working Group II Report Ch. 14 at 624; *see also* Discussion § 3(b)(1).

²¹⁷ Press Release, International Union for the Conservation of Nature, IUCN Redlist for birds: Climate change and continental drift, *available at* <http://cms.iucn.org/index.cfm?uNewsID=947> (last visited May 7, 2009). The factors that contribute to the loss of bird species include, among other things, temperature changes, the long-term droughts, and extreme weather.

escalate farm animal mortality and morbidity.²¹⁸ A 2006 heatwave in California, for example, killed at least 25,000 cows and 700,000 chickens.²¹⁹ These heatwaves not only harm domestic animals, but will cause severe economic damage to the farm animal sector.²²⁰ Parasites²²¹ and diseases that affect animals, such as bovine respiratory diseases and bluetongue, have been increasing as a result of rising temperatures.²²² Both the prevalence and intensity of these changes are expected to increase as greenhouse gas emissions continue to rise during the 21st century.²²³

Extreme weather events such as hurricanes have caused an estimated injury or death of 600,000 companion animals²²⁴ and thousands to millions of farm animals.²²⁵ Sea-temperature increase is also reducing oceanic biodiversity, including oceanic prey such as plankton, krill, fish, and squid.²²⁶ This reduction will devastate marine mammals, birds, cetaceans, and pinnipeds, as well as economies reliant on these species.²²⁷

Another harm to animals will be from habitat loss due to climate change. Entire species of trees, which are critical to wildlife habitat, are suffering from problems such as shorter growing periods²²⁸ and threats from invasive species.²²⁹ Sea-level rise already

²¹⁸ Peter Backlund et al., USDA, The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity, A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research 66 (2008) available at http://www.usda.gov/oce/global_change/files/CCSPFinalReport.pdf [hereinafter USDA Report].

²¹⁹ *Deaths mount amid California heat*, BBC News, Jul. 29, 2006, available at <http://news.bbc.co.uk/1/hi/world/americas/5223172.stm> (last visited May 7, 2009).

²²⁰ USDA Report at 65.

²²¹ U.S. CCSP Review at 5-21.

²²² U.S. CCSP Review at 5-21.

²²³ IPCC Synthesis Report at 2-5.

²²⁴ *House Passes Pet Evacuation Bill*, Columbia Broad. Sys. News, May 22, 2006, available at <http://www.cbsnews.com/stories/2006/05/22/politics/main1644260.shtml> (last visited May 4, 2009).

²²⁵ USDA Office of Chief Economist, A Preliminary Assessment of the Effects of Katrina and Drought on U.S. Agriculture (Sept. 19, 2005) at 4, see Attach. 6.

²²⁶ IPCC Working Group II Report Ch. 4 at 236. See also EPA GHG Endangerment Finding at 18899.

²²⁷ IPCC Working Group II Report Ch. 4 at 236

²²⁸ *Id.* at 227-228.

²²⁹ U.S. CCSP Review at 5-20.

endangers 161 coastal wildlife refuges in the United States.²³⁰ More than 50 percent of U.S. salt marsh habitat has already been lost and growing sea levels threaten remaining habitats.²³¹ Rising sea-levels also threatens developed coastal areas in the United States, which will harm urban wildlife and cause severe economic²³² and infrastructure loss to the public.²³³ Droughts caused by climate change are also estimated to harm ecosystems and important habitats for animals.²³⁴

The increase in temperatures due to the anthropogenic release of greenhouse gases into the ambient air will directly harm public health and welfare and the indirect results of a warmer planet, including the spread of diseases, rising sea temperatures and levels, and droughts in sensitive ecosystems undoubtedly meet the endangerment standard as set forth by section 111 of the Clean Air Act.

b. CAFO Emissions of Hydrogen Sulfide Endanger Public Health and Welfare

Hydrogen sulfide emissions from CAFOs cause toxic exposures and contribute to ecosystem acidification that endanger public health and welfare. EPA itself recognizes hydrogen sulfide endangers public health and welfare.²³⁵ Harms to public health and welfare come immediately in the form of direct exposure and hydrogen sulfide continues to endanger public health and welfare as a contributor to regional sulfur burdens and atmospheric acidification.

²³⁰ *Id.* at 5-3.

²³¹ IPCC Working Group II Report Ch. 14 at 623.

²³² *Id.* at 626. According to the IPCC report, this includes “79% of the property in Florida, 63% of the property in New York, and 61% of the property in Connecticut” in coastal areas, which are all at risk for damages from hurricanes and flooding.

²³³ National Research Council, *supra* note 208.

²³⁴ *See, e.g.*, U.S. CCSP Review at 5-3.

²³⁵ EPA, *Integrated Risk Information System, Hydrogen Sulfide*, Jan. 18, 2009, available at <http://www.epa.gov/IRIS/subst/0061.htm> (last visited Feb. 7, 2009).

Hydrogen sulfide is a broad-spectrum poison, meaning that it can poison several different systems, affecting humans and animals by blocking oxygen from binding and stopping cellular respiration.²³⁶ Illness from hydrogen sulfide exposure can include headaches, eye and throat irritation, toxicity in cardiovascular, gastrointestinal,²³⁷ and central nervous systems,²³⁸ and respiratory complications.²³⁹ Hydrogen sulfide is considered immediately dangerous to life or health at 100ppm,²⁴⁰ particularly because it causes loss in ability to smell at levels above 150 ppm,²⁴¹ but exposure to hydrogen sulfide can endanger human and animal health even at low levels.²⁴²

At low levels hydrogen sulfide has a rotten egg smell that is commonly responsible for the strong odors in areas local to CAFOs.²⁴³ At levels higher than 150 ppm, hydrogen sulfide can cause loss of consciousness and even death.²⁴⁴ Levels higher than 1,000 ppm have been reported at recently disturbed CAFO manure lagoons²⁴⁵ and it is not surprising that symptoms of exposure have been routinely documented in CAFO workers and members of communities surrounding CAFOs.²⁴⁶ There have been at least 125 OSHA-

²³⁶ Agency for Toxic Substances and Disease Registry, *Toxicological Profile For Hydrogen Sulfide*, July 2006, available at <http://www.atsdr.cdc.gov/toxprofiles/tp114.pdf> (last visited May 1, 2009).

²³⁷ Agency for Toxic Substances & Disease Registry, Medical Management Guidelines for Hydrogen Sulfide (Sept. 24, 2007), available at <http://www.atsdr.cdc.gov/MHMI/mmg114.pdf> (last visited May 1, 2009); see also Marvin S. Legator et al., *Health Effects from Chronic Low-Level Exposure to Hydrogen Sulfide*, 56 ARCHIVES OF ENVTL. HEALTH. 2 125 (March/April 2001).

²³⁸ Legator, *Health Effects from Chronic Low-Level Exposure to Hydrogen Sulfide*, *supra* note 234, at 126.

²³⁹ *Id.* at 125-126.

²⁴⁰ U.S. Dep't of Labor, Occupational Health & Safety Admin. [OSHA], Chemical Sampling Information: Hydrogen Sulfide (Feb 16, 2007), available at http://www.osha.gov/dts/chemicalsampling/data/CH_246800.html (last visited May 1, 2009).

²⁴¹ Iowa CAFO Study at 124.

²⁴² *Id.* at 125. Individuals in communities exposed to hydrogen sulfide levels as low as 0.095 ppm display symptoms of exposure.

²⁴³ NRC Air Emissions from AFOs at 55.

²⁴⁴ Iowa CAFO Study at 118.

²⁴⁵ *Id.*

²⁴⁶ *Id.* at 125.

reported deaths from hydrogen sulfide exposure since 1984.²⁴⁷ Clearly hydrogen sulfide exposure can create an immediate danger to the health and lives of those living near CAFOs: in June 2008, the Minnesota Department of Health asked families near the 1,500-cow Excel Dairy facility to evacuate their homes because the concentrations of hydrogen sulfide emissions from the CAFO were dangerously high.²⁴⁸

The same dangers from exposure to hydrogen sulfide affect mammals, birds, and aquatic life and are considered to have one of the greatest impacts on animal health.²⁴⁹ Numerous studies have linked farm animals' exposure to hydrogen sulfide with illness, disease, and death.²⁵⁰ Even at low levels, hydrogen sulfide is an irritant to farm animals, producing respiratory and immune system complications as well as inflammation and lesions in eye and other mucus membranes.²⁵¹ In higher levels, hydrogen sulfide emissions have caused large-scale die-offs in wild birds and mammals.²⁵² Local aquatic life is also endangered when hydrogen sulfide emissions are redeposited into the ecosystem. Fish exposed to hydrogen sulfide have shown gill damage that resulted in decreased respiratory function or even death.²⁵³ Decreased respiratory function, caused in part by hydrogen sulfide, increases susceptibility to disease and parasites in aquatic life.²⁵⁴

²⁴⁷ See generally OSHA, Accident Search Database, available at http://www.osha.gov/pls/imis/AccidentSearch.search?acc_keyword=%22Hydrogen%20Sulfide%22&keyword_list=on

²⁴⁸ Tom Meersman, *Stunk out of house and home near a dairy feedlot*, STARTRIBUNE, June 9, 2008, available at http://www.startribune.com/local/19697279.html?location_refer=Most%20Viewed:Homepage (last visited May 4, 2009).

²⁴⁹ Iowa CAFO Study at 116-118.

²⁵⁰ *Id.* at 118.

²⁵¹ *Id.* at 116-118. Low levels assumes levels higher than 10 ppm.

²⁵² David J. Hoffman, et al., *Handbook of Ecotoxicology* 2 (2003).

²⁵³ Marius C. B. Kiemer, et al., *The effects of chronic and acute exposure to hydrogen sulphide on Atlantic salmon (Salmo salar L.)*, 135 AQUACULTURE 4 311-327 (1995), see Attach. 7.

²⁵⁴ See S.E. Shumway and T.M. Scott, *The effects of anoxia and hydrogen sulfide on survival, activity and metabolic rate in the coot clam, Mulinia lateralis (Say)* 71 J. EXP. MAR. BIOL. ECOL. 1 135-146 (1993), see Attach. 8.

Hydrogen sulfide also endangers public health and welfare when it works as a precursor to other pollution problems. Hydrogen sulfide is one of the principal components of the sulfur cycle that, when released in excess amounts, contributes to a region's sulfur burden and the formation of PM_{2.5}.²⁵⁵ These pollutants can travel for long distances to “damages trees, crops, historic buildings, and monuments” and acidify ecosystems.²⁵⁶ The danger to public health and welfare from immediate exposure to hydrogen sulfide and its contribution to atmospheric acidification clearly meets the endangerment standard in section 111.

c. CAFO Emissions of Ammonia Endanger Public Health and Welfare

Ammonia emissions from CAFOs cause serious health risks associated with exposure and ecosystem acidification and eutrophication and contribute to PM_{2.5} formation that endangers public health and welfare. EPA itself recognizes that ammonia endangers public health and welfare.²⁵⁷ Harms to public health and welfare come immediately in the form of direct exposure and ammonia continues to endanger public health and welfare as ammonia acts as a precursor to the formation of PM_{2.5}.

Because ammonia is rapidly absorbed into the upper respiratory system, direct exposure to even low levels of emissions can be harmful to human and animal health.²⁵⁸ Moderate concentrations can cause severe coughing and mucus production as well as irritation of the eyes, sinuses, and skin.²⁵⁹ Higher exposures for as little as two minutes can

²⁵⁵ The sulfur cycle is a process where sulfur compounds are released into the air and broken down into other chemicals, eventually to be redeposited back into the soil.

²⁵⁶ EPA, *Six Common Air Pollutants: Chief Causes for Concern*, April 8, 2008, available at <http://www.epa.gov/air/urbanair/so2/chf1.html> (last visited May 1, 2009).

²⁵⁷ EPA, Integrated Risk Info. Sys., *Ammonia*, Jan. 18, 2009, available at <http://www.epa.gov/iris/subst/0422.htm> (last visited May 4, 2009).

²⁵⁸ Iowa CAFO Study at 123.

²⁵⁹ *Id.*

result in chemical burning of the skin and eyes, permanent scarring of the upper respiratory system, and chronic lung disease.²⁶⁰ The OSHA permissible exposure level is 50 ppm, but CAFOs regularly report concentrations higher than 100 ppm.²⁶¹ Exposures of 500 ppm can be fatal.²⁶²

Ammonia, like hydrogen sulfide, is one of the gases emitted by CAFOs that has the greatest impacts on animal health.²⁶³ Studies of confined farm animals' ammonia exposures have documented the correlation of higher rates of reduced growth, muscle lesions, reduced functions and infections in the respiratory system, and increased risk of secondary infection, with higher ammonia exposure.²⁶⁴ Ammonia is considered the most significant air pollutant in cattle barns and the most harmful gas in broiler chicken "grow-out" sheds.²⁶⁵ Ammonia concentrations in CAFOs are a chronic stressor on farm animals and raise the chances of secondary infections, which increase the risks of diseased animal products reaching human points of consumption.²⁶⁶

Ammonia also harms ecosystems in areas where there are significant air emissions of this pollutant. Ammonia has been "identified as a major cause of soil acidification" and a cause of "eutrophication of surface water and soil" when it is redeposited from the air onto land or water bodies.²⁶⁷ In water, eutrophication commonly results in severe reductions in

²⁶⁰ *Id.*

²⁶¹ Nat'l Inst. for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards: Ammonia*, Sept. 2005, available at <http://www.cdc.gov/niosh/npg/npgd0028.html> (last visited May 4, 2009).

²⁶² Iowa CAFO Study at 124.

²⁶³ Iowa CAFO Study at 117.

²⁶⁴ *Id.*

²⁶⁵ Iowa CAFO Study at 117-118.

²⁶⁶ *Id.* at 117.

²⁶⁷ EPA Nat'l Risk Mgmt Research Laboratory, Review of Emission Factors and Methodologies to Estimate Ammonia Emissions From Animal Waste Handling at 3, *supra* note 120.

water quality and oxygen levels.²⁶⁸ Eutrophication can harm or kill sensitive plant and aquatic life populations and reduces biodiversity. On land, acidification and eutrophication can “put stress on species diversity”²⁶⁹ and harm production of sensitive crops, including tomatoes, cucumbers, conifers, and fruit.²⁷⁰ Acidification and eutrophication from ammonia can leave plants “more susceptible to insects and fungal infections,” drought, frost, and displacement from invasive species.²⁷¹

As a precursor to PM_{2.5}, ammonia not only harms human and animal health, but also affects visibility, causes loss of biodiversity, harms crop and commercial forest production, and destroys wildlife habitat.²⁷² The harms associated with PM_{2.5} will be discussed below. The significant danger to public health and welfare from direct exposure to CAFO ammonia air emissions requires listing this industry under section 111.

d. CAFO Emissions of Particulate Matter Endanger Public Health and Welfare

Particulate matter emissions from CAFOs cause toxic exposures and increases haze and smog that endanger public health and welfare. The dangers of PM emissions are well-established, and regulatory standards already exist for occupational and ambient conditions. *See* 40 CFR Pt. 51. Harms come when exposed humans and animals inhale PM, when PM creates haze, and when PM acidifies ecosystems, reducing biodiversity, visibility, and the public’s ability to appreciate outdoor areas.

²⁶⁸ U.S. Geological Survey, Toxic Substances Hydrology Program, *Eutrophication*, Mar. 13, 2008, available at <http://toxics.usgs.gov/definitions/eutrophication.html> (last visited May 1, 2009); *see also* Iowa CAFO Study at 42.

²⁶⁹ *Id.*

²⁷⁰ L.J.M. Van der Eerden, et al., *Risk of damage to crops in the direct neighbourhood of ammonia sources*, 102 ENVIRONMENTAL POLLUTION 1 49-53 (1998), *see* Attach. 9.

²⁷¹ EPA Nat’l Risk Mgmt Research Laboratory, Review of Emission Factors and Methodologies to Estimate Ammonia Emissions From Animal Waste Handling at 3, *supra* note 120.

²⁷² *See* generally, Facts Section of this document.

Inhalable particulates, depending on their size, can settle in the upper airways or be absorbed into the human system.²⁷³ Common medical problems associated with inhaling particulates are respiratory diseases and cardiovascular irregularities in both humans and animals.²⁷⁴ Populations with a greater incidence of long-term exposure to particulates were found to have higher rates of chronic respiratory problems, decline in lung function, and mortality from major cardiovascular diseases.²⁷⁵ Up to 40 percent of PM_{2.5} from CAFOs can be absorbed in human and animal systems and have generally been associated with the broad range of negative health effects listed above.²⁷⁶ For example, 1,292 deaths occur annually as a result of current PM_{2.5} levels in the CAFO-laden San Joaquin Valley air basin in California.²⁷⁷ The failure to meet the 2008 PM_{2.5} standard and the 1997 Ozone Standard in the San Joaquin Valley costs residents \$5.7 billion, most of which is the “cost” of premature deaths linked to PM₂ annually.²⁷⁸ One-third of PM₁₀ emitted from CAFOs is inhalable and has been linked to asthma and bronchitis.²⁷⁹ Respiratory problems associated with PM exposure have been documented in farm animals.²⁸⁰

Particulates from CAFOs contain toxins from fecal matter and fungus.²⁸¹ Toxins associated with CAFO PM have resulted in reduced growth, reduced functions in the respiratory system, increased nasal diseases, and even the loss of body parts from

²⁷³ NRC Air Emissions from AFOs at 55.

²⁷⁴ EPA, *Particulate Matter, Health and Environment*, May 9, 2008, available at <http://www.epa.gov/particles/health.html> (last visited May 1, 2009).

²⁷⁵ Iowa CAFO Study at 126.

²⁷⁶ *Id.*

²⁷⁷ Renee Sharp and Bill Walker, Environmental Working Group, *Particle Civics: How Cleaner Air in California Will Save Lives and Save Money* (2002).

²⁷⁸ Jane V. Hall, et al., The Benefits of Meeting Federal Clean Air Act Standards in the South Coast and San Joaquin Valley Air Basins 77 (Nov. 2008).

²⁷⁹ Iowa CAFO Study at 126.

²⁸⁰ *Id.* at 118.

²⁸¹ *Id.* at 52.

fungus.²⁸² Histoplasmosis, just one of the diseases caused by fungus found in CAFO manure,²⁸³ “is frequently diagnosed in farm personnel cleaning up litter and debris from poultry houses, sheds, and barns.”²⁸⁴ In a community immediately adjacent to Heartland Quality Egg Farm in Ohio, one of several residents diagnosed with histoplasmosis was required to have a piece of his lung removed while another required leg amputation after the fungus had spread in his body.²⁸⁵

The presence of PM2.5 and PM10 in a region can also cause severe haze.²⁸⁶ The EPA reports that haze from particulates has reduced visibility in the United States “from 90 miles to between 15 and 25 miles in the East and from 140 miles to between 35 and 90 miles in the West,” which creates significant losses for the public enjoyment of wildlife and wilderness areas and on tourism industries reliant on scenery.²⁸⁷ The National Park tourism industry, which generates approximately \$14.55 billion annually, is harmed by haze because it often depends on natural views and opportunities to experience wildlife to attract visitors.²⁸⁸ For example, the decrease in tourism in the area around the Great Smoky Mountains National Park due to loss of visibility is estimated to cost more than

²⁸² *Id.*

²⁸³ Ctrs for Disease Control & Prevention, Nat’l Ctr for Zoonotic, Vector-Borne, and Enteric Diseases, *Histoplasmosis* (March 27, 2008), available at http://www.cdc.gov/nczved/dfbmd/disease_listing/histoplasmosis_gi.html (last visited May 1, 2009).

²⁸⁴ Melvin L. Myers, et al., eds., *Papers and Proceedings of the Surgeon General’s Conference on Agriculture Safety and Health* (May 3, 1991), available at http://profiles.nlm.nih.gov/NN/B/B/W/K/_nnbbwk.ocr (last visited May 8, 2009).

²⁸⁵ *Id.*

²⁸⁶ NRC Air Emissions from AFOs at 72 (Table 3-7).

²⁸⁷ EPA, *Basic Information – Visibility* (Sept. 16, 2008), available at www.epa.gov/oar/visibility/what.html (last visited May 4, 2009).

²⁸⁸ L. Bruce Hill, ABT Associates, *Out of Sight: The Science and Economics of Visibility Impairment* ES-7 (2000), available at <http://www.abtassociates.com/reports/ES-clear.pdf> (citing B. Peacock, et. al., U.S. Dep’t of the Interior, *State and National Economic Impacts Associated with Travel Related Expenditures by Recreational Visitors to Lands Managed by the U.S. Department of the Interior*, Jan. 16, 2000).

\$200 million each year.²⁸⁹ This region of the United States includes the number two production area for hog CAFOs.²⁹⁰ This loss is also felt by the public who wants to experience wilderness areas and wildlife in a natural habitat.

Particulates can also impact distant areas as they are carried by wind and redeposited on the ground or in water.²⁹¹ As discussed above, when particulates are comprised of ammonia, a common emission from CAFOs, the effects can include “making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.”²⁹²

e. CAFO Emissions of Volatile Organic Compounds Endanger Public Health and Welfare

VOC emissions from CAFOs cause adverse health effects and contribute to haze and smog formation as a precursor to ground-level ozone and PM_{2.5} formation. The dangers of VOC emissions to public health and welfare are well-established, and regulatory standards already exist for consumer and commercial products as well as ambient conditions for VOCs in ozone non-attainment areas. 42 U.S.C. 7511b; 40 C.F.R. Pt. 59. Harms to public health and welfare come immediately in the form of direct exposure and VOCs continue to endanger public health and welfare when VOCs act as a precursor to the formation of ground level ozone and PM_{2.5}.

²⁸⁹ Environmental Defense, et al., North Carolina Smokestacks Plan 5 (2001), *available at* http://www.edf.org/documents/700_NCsmokestacks.PDF.

²⁹⁰ USDA, NASS, 2007 Census of Agriculture State Profile: North Carolina, *available at* http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/North_Carolina/cp99037.pdf.

²⁹¹ EPA, Technology Transfer Network OAR Policy and Guidance, *Health and Environmental Effects of Particulate Matter: Fact Sheet* (Jul. 19, 1997), *available at* <http://www.epa.gov/ttn/oarpg/naaqsfm/pmhealth.html> (last visited May 4, 2009).

²⁹² EPA, *Particulate Matter – Health and Environment* (Nov. 27, 2007), *available at* <http://www.epa.gov/particles/health.html> (last visited May 1, 2009).

The Iowa CAFO Air Quality Study reviewed existing research and concluded that the VOC emissions recognized “from CAFOs may well have adverse health effects.”²⁹³ As stated previously, 21 of the 165 VOCs potentially emitted at CAFOs are listed as HAPs.²⁹⁴ HAPs are pollutants “known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects.” 42 U.S.C. § 7412(b)(3)(B). The mere fact that 22 VOCs emitted by CAFOs are listed as HAPs strongly suggests that the mixture of VOC emissions from CAFOs not regulated by 112 also harm human health. Symptoms of VOC exposure from animal production include decreased immune response, increased cancer rates in animals, otolaryngological and respiratory irritation and congestion, and gastrointestinal problems.²⁹⁵ Odors caused by VOCs also impact entire communities. Studies on the impacts of CAFOs on surrounding communities found reduction in property values and increase in violent and theft-related crimes as compared to similar populations without VOC odors.²⁹⁶

VOCs are regulated under the CAA because they are precursors to ground-level ozone, a “harmful pollutant” found in high levels throughout the United States and the main ingredient in smog.²⁹⁷ See 42 U.S.C. § 7511b. Ground-level ozone and smog are throat and respiratory irritants, and can exacerbate pulmonary problems and respiratory diseases

²⁹³ Iowa CAFO Study at 129-131. (“While CAFO odors have long been recognized as a neighborhood nuisance, recent studies have suggested that odiferous exposures emitted from CAFOs may well have adverse health effects.”).

²⁹⁴ San Joaquin Valley Unified Air Pollution Control District, Preliminary Draft Staff Report: Rule 4570 (Confined Animal Facilities) 25 (April 12, 2005), *available at* www.valleyair.org/Workshops/postings/2009/03-10-09/R4570_StaffReport_SM.pdf

²⁹⁵ Iowa CAFO Study at 129-131.

²⁹⁶ *Id.* at 152-58. One study found that “[f]or every thousand hogs added in the five-mile area, [researchers] found an average drop in sale price of \$430 per property.” Another study found that “an average vacant parcel within three miles of a CAFO in Missouri lost about 6.6 percent in value, but if a parcel with a house on it was within 1/10 mile of the CAFO, it lost 88 percent of its value.” Violent crime increased by 378 percent in areas with CAFOs as opposed to a general drop in violent crime by 29 percent in other similar areas with no CAFOs. Similarly, theft-related crimes increased by 64 percent while comparable counties without CAFOs experienced a decrease of 11 percent.

²⁹⁷ EPA, *Ozone – Good Up High Bad Nearby* (Feb. 12, 2008), *available at* <http://www.epa.gov/oar/oaqps/gooduphigh/bad.html> (last visited May 8, 2009).

such as bronchitis, emphysema, and asthma, effecting millions of Americans “who spend[] time outdoors in the summer.”²⁹⁸ According to the EPA, ground-level ozone “leads to reduced agricultural crop and commercial forest yields, reduced growth and survivability of tree seedlings, and increased susceptibility to diseases, pests and other stresses such as harsh weather.”²⁹⁹ The effect of this damage is that ground-level ozone causes an estimated \$500 million in reduced crop production each year.³⁰⁰ Furthermore, ground-level ozone can damage the foliage of trees that are crucial to wildlife habitat.³⁰¹

C. The Administrator Must Exercise Her Authority under Section 111 to List and Promulgate Performance Standards for CAFOs

CAFOs contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.³⁰² 42 U.S.C. § 7411(b)(1)(A). CAFOs meet the definition of a stationary source under the Act, and therefore are eligible for listing under section 111.³⁰³ See 42 U.S.C §§ 7411(a)(3), (b)(1)(A). The CAA, moreover, is a precautionary statute and “demand[s] regulatory action to prevent harm, even if the regulator is less than certain that harm, is otherwise inevitable.” *Ethyl Corp. v. EPA*, 541 F.2d 1, 25, (D.C. Cir. 1976). Specifically, the 1977 Amendments to section 111 were designed to “emphasize the precautionary or preventative purpose of the act (and, therefore, the Administrator’s duty to assess risks rather than wait for proof of harm).”³⁰⁴

²⁹⁸ *Id.*; see, e.g., EPA, Smog—Who Does It Hurt? What You Need to Know About Ozone and Your Health (July 1999), available at <http://www.epa.gov/airnow/health/smog.pdf>; see also discussion at subsection 3a(2)-(5).

²⁹⁹ EPA, *Ozone – Good Up High Bad Nearby*, *supra* note 293.

³⁰⁰ *Id.*

³⁰¹ *Id.*

³⁰² Many peer-reviewed scientific studies have been performed on emissions from CAFOs, contributing to an understanding of what and how much is being emitted by these operations. See, e.g., Iowa CAFO Study at 48, 61 (housing unit emissions); 54 (manure storage); 65-6 (land disposal).

³⁰³ See *supra* section IV. A.

³⁰⁴ H.R. Rep. 294, 50-51 (1977) (amendments are designed to “emphasize the precautionary or preventive purpose of the act (and, therefore, the Administrator’s duty to assess risks rather than wait for proof of actual harm)”).

Because of the serious consequences caused by emissions from CAFOs, it would be unreasonable for the Administrator not to take immediate action to regulate CAFO emissions under section 111.

Once the Administrator finds that CAFOs contribute significantly to air pollution that endangers public health or welfare, no discretion exists as to whether or not she must regulate such emissions from this industry, under CAA section 111. *Nat'l Res. Def. Council, Inc. v. Train*, 411 F.Supp. 864, 868 (S.D.N.Y. 1976). Because of the large amounts of dangerous pollutants from CAFOs as a whole, like other categories of stationary sources regulated under section 111, there can be no reasoned explanation for the EPA to refuse to list them as a category of sources under section 111. "A long line of precedent has established that an agency action is arbitrary when the agency offered insufficient reasons for treating similar situations differently." *Transactive Corp. v. U.S.*, 91 F.3d 232, 237 (D.C. Cir. 1996); *see also Indep. Petroleum Ass'n of Amer. v. Babbitt*, 92 F.3d 1248, 1258 (D.C. Cir. 1996) ("An agency must treat similar cases in a similar manner unless it can provide a legitimate reason for failing to do so."). The EPA's refusal to list CAFOs as a category of stationary sources under section 111 would be an arbitrary and capricious approach to the regulation of greenhouse gas emissions and other air pollution problems.

Furthermore, the existence of the AFO Air Compliance Agreement ("the Agreement") is not a defensible reason to refuse to list CAFOs under section 111. The Agreement only gives AFOs *who signed it* immunity from liability under Parts C and D of Title I, and section 111 falls into Part A of Title I.³⁰⁵ *See* 42 U.S.C. §§7401-7431. The Agreement is merely a voluntary contract between EPA and qualifying AFOs: there is no

³⁰⁵ Animal Feeding Operations Consent Agreement and Final Order, 70 Fed. Reg. 4,958 (Jan. 31, 2005).

blanket immunity for AFOs as a whole.³⁰⁶ Furthermore, the Agreement only grants immunity from civil violations under permitting requirements under the State Implementation Program or of Title I, Parts C and D and Title V of the Act, which does not impede this petition. The Coalition asks the Administrator to move forward to list this industry under CAA section 111, based on currently available scientific data demonstrating that CAFO emissions contribute significantly to the air pollution EPA has recently stated endangers public health and welfare.³⁰⁷ Additionally, the Administrator must issue new and existing CAFO performance standards.

1. Using Section 111 to Regulate Air Pollutant Emissions from CAFOs Is Effective and Feasible

It is possible to achieve drastic reductions in air pollution emissions from CAFOs using the authority given to the Administrator in promulgating performance standards for CAFOs. Section 111(h)(1) of the CAA defines the technologies in a new source performance standard as including “design, equipment, work practice or operational standard[s].” 42 U.S.C. §7411(h)(1). Case law as well as the 1990 legislative history to the CAA supports the notion that pollution reduction can be achieved through a variety of means and is not limited to end-of-pipe controls.³⁰⁸ The factors affecting CAFO emissions are understood and many are controllable, such as whether waste storage conditions are aerobic or anaerobic; the diet fed to the animals; the pH of the manure; and time and temperature of animal waste in storage.³⁰⁹ Promulgating standards of performance for CAFOs that address these factors would result in easily achieved and substantial reductions in emissions. For factors

³⁰⁶ *Id.*

³⁰⁷ *See generally* EPA GHG Endangerment Finding.

³⁰⁸ U.S. EPA Emissions from AFOs at 2-14; *See generally, State of New York v. Reilly*, 969 F.2d 1147 (D.C. Cir. 1992), (municipal incinerators may use work practices to control incineration pollution); S. Rep. 228, 291.

³⁰⁹ U.S. EPA Emissions from AFOs at 2-14.

that cannot be reduced through work practices, there is demonstrated technology to capture and reduce emissions.³¹⁰ In addition, “[r]elatively accurate but inexpensive instruments” exist for measuring the major CAFO pollutants to determine what controls are needed.³¹¹

Simple work practice changes, such as reducing the time between surface application of manure and incorporation into soil, ensuring proper soil drainage, ensuring adequate oxygen exposure to stockpiles or irrigating directly after application, can significantly reduce emissions. For example, CAFO operators can reduce PM from open lots simply by removing manure from the lots more frequently.³¹² The length and position of feed delivery technology can reduce PM emissions from feed boxes.³¹³ Planting buffer strips around CAFOs could trap many gases and particles and prevent them from being redeposited in other areas.³¹⁴ Furthermore, using techniques that reduce PM inside buildings where animals are housed also improve animal performance and reduce disease transmission between animals and workers.³¹⁵ Switching from farm animal production systems reliant on feedcrops like grain and soy to pasture-raised, organic, or full cycle farming systems can result in less methane, ammonia, and nitrous oxide emissions³¹⁶ and is potentially or likely more cost-effective because it requires less inputs, maintenance, and

³¹⁰ See, e.g., Iowa CAFO Study at 205.

³¹¹ Bryan Bunton, et. al., *Monitoring and Modeling of Emissions from Concentrated Animal Feeding Operations: Overview of Methods*, 115 ENVTL. HEALTH PERSPECT 2 303-307 (February 2007) (inexpensive is defined as >\$10,000), see Attach. 10.

³¹² B. Auverman, et al., Nat’l Ctr. for Manure and Animal Waste Mgmt. and Midwest Plan Services, *Particulate Matter Emissions from Confined Animal Feeding Operations: Management and Control Measures* (2001) 21-25, see Attach. 11.

³¹³ *Id.*

³¹⁴ *Id.*

³¹⁵ *Id.* at 20.

³¹⁶ Cattle raised on pasture, eating a more natural, low-energy diet composed of grasses and other forages, may produce manure with about half of the potential to generate methane. EPA GHG Inventory at 5-5.

energy at the facility.³¹⁷ If simple regulations were made to normalize management practices, a significant reduction in emissions could be achieved.

There are currently demonstrated control technologies that are commercially available and technologically and economically viable. In a 2006 Department of Agriculture study at major pig confinement facilities, a switch from a traditional anaerobic lagoon/spray irrigation technique to a new treatment method using a dual wastewater treatment and manure composting systems resulted in a 96.9 percent reduction in GHG emissions at a benefit of \$4.59 per finished pig.³¹⁸ Other studies showed that installing simple filters in ventilation and recirculation systems reduced hydrogen sulfide emissions by 80 to 90 percent and ammonia emissions by 50 to 60 percent.³¹⁹

Using section 111 to regulate CAFOs is also necessary because a national approach to CAFO regulation would be more effective than the existing regulatory approach. The current lack of EPA oversight has resulted in inadequate and inconsistent state and local regulation. Existing state and local regulations for CAFOs are inadequate to ensure that emissions from CAFOs are not endangering public health or welfare because they do not reduce greenhouse gas emissions or meet rigid enough standards to protect public health and welfare. For example, only 10 states have set emissions standards for hydrogen sulfide, all of which vary greatly.³²⁰ Even in states that have standards, they often do not meet the recommended guidelines set for ambient exposure limits for hydrogen sulfide by the EPA

³¹⁷ UCS Report at 3, 54.

³¹⁸ Matias B. Vanotti et al., *Greenhouse gas emission reduction and environmental quality improvement from implementation of aerobic waste treatment systems in swine farms*, 1 WASTE MGMT 28 759-766, 765 (2008) (the economic benefit counts a carbon credit to the facility), see Attach. 12.

³¹⁹ Iowa CAFO Study at 205.

³²⁰ *Id.* at 72.

and the Agency for Toxic Substances and Disease Registry.³²¹ A national approach to establishing these regulations and emissions standards is necessary because every state in the United States has farm animals raised in confinement and almost every state has AFOs with more than 300 animals.³²² Setting federal guidelines and performance standards for CAFOs will minimize risks to public health and welfare by creating consistent emissions limitations at levels that ensure safety.

While best available technology is continually being updated, the technology has demonstrated results sufficient enough to set standards. Courts have routinely agreed that “adequately demonstrated” does not mean that the facilities must already be capable of achieving standards, but rather that “[s]ection 111 looks toward what may fairly be projected for the regulated future, rather than the state of the art at present...” *Portland Cement Ass’n v. Ruckelshaus*, 486 F.2d 375, 391 (D.C. Cir. 1973). The field technologies discussed above can already provide a significant reduction in CAFO emissions while new technologies are being developed. For example, the EPA notes that the poultry industry is the largest contributor to the country’s ammonia emissions (27 percent in 2002), and there are already field-tested technologies that provide up to 50 percent reductions in ammonia emissions from poultry CAFOs.³²³

Demonstrated and tested technology is already available for commercial use. Techniques such as acidification of manure can suppress ammonia formation by up to

³²¹ Agency for Toxic Substances and Disease Registry, *Health Consultation: Mountain View Sewer Gas Investigation Scottsdale Maricopa County Arizona* (2003), available at http://www.atsdr.cdc.gov/HAC/pha/mountainview/mou_p1.html#healthb (last visited May 8, 2009).

³²² Claudia Copeland, Congressional Research Service, *Air Quality Issues and Animal Agriculture: A Primer*, CRS-7 28-29 (2007), available at <http://digital.library.unt.edu/govdocs/crs/permalink/meta-crs-8641:1>, citing USDA 2000 Manure Nutrients Report.

³²³ United Egg Producers, Application for an NRCS Conservation Innovation Grant, 1, see Attach. 13.

70%.³²⁴ Swine and poultry AFOs have successfully employed this method in the past.³²⁵ Biofilters, consisting of microbes in some organic media, have been proven to remove 50 to 83% of ammonia and 80 to 86% of hydrogen sulfide from facility air before it is released to the ambient environment.³²⁶ In combination, some of these management practices (e.g., diet, enzyme additives, and injection) may significantly reduce overall emissions at CAFOs. Moreover, with facility-specific emissions data, mitigation techniques can be deployed in a more precise manner to eliminate the higher priority emissions.

As discussed in section III(A), the number of CAFOs and the air pollution emitted by them is steadily increasing. Promulgating standards for these sources now will help ensure that harms to public health and welfare from CAFOs will not increase. It is for these reasons that the EPA should regulate CAFOs to ensure that mitigation technologies are being utilized and have a net benefit for human health and welfare, the environment, as well as producers. In Iowa, for example, methane capture would only have to be used on the largest manure storage facilities (CAFOs with 5,000 or more animals) to reduce their collective emissions by 700,000 tons of carbon dioxide equivalent per year, or 1% of the total U.S. greenhouse gas emissions from reducing emissions in just one state.³²⁷ There is more than enough information and tested emissions reduction technology for the Administrator determine that CAFOs contribute significantly to the air pollution EPA already has found endangers public health and welfare, and to list the CAFO industry, and promulgate new and existing source performance standards for it.

³²⁴ U.S. EPA Emissions from AFOs at 9-18.

³²⁵ *Id.* at 9-18.

³²⁶ *Id.* at 9-20.

³²⁷ See generally R.A. Ney et. al., Ctr. for Global and Regional Env'tl Research, Univ. of Iowa, Iowa greenhouse gas action plan (1996), available at www.cgrer.uiowa.edu/research/reports/iggap/finalgg3.PDF.

VI. CONCLUSION

Mitigating the animal agriculture sector's significant yet underappreciated role in climate change and other air pollution problems is vital for the health and sustainability of the planet, the environment, and its human and nonhuman inhabitants. The negative impacts from CAFO emissions are already occurring and will only worsen as the trend toward concentrated farm animal production continues to increase. Scientific consensus supports immediate listing of CAFOs and the issuance of new source performance standards for the industry. The farm animal production sector is the largest contributor of ammonia, and is a major contributor of hydrogen sulfide and VOCs, as well as being responsible for more GHG emissions than the transportation sector. Because CAFOs, specifically, contribute to such a large portion of the farm animal production sector air emissions, regulating this industry is entirely justified. Based on the information contained in this petition, it is unreasonable for the Administrator not to determine that CAFOs contribute significantly to air pollution that endangers public health and welfare. The Administrator also must list CAFOs under section 111 and promulgate standards for new, modified, and existing CAFOs.

Respectfully Submitted,

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September 21, 2009

EXHIBIT 24

Declaration of James R. Barker

**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondents.

No. 09-1322 and consolidated
cases

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1073 and consolidated
cases

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1092 and consolidated
cases

SOUTHEASTERN LEGAL
FOUNDATION, ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1131 and consolidated
cases

**DECLARATION OF JAMES R. BARKER, EXECUTIVE VICE
PRESIDENT, ROSEBUD MINING COMPANY**

I, James R. Barker, swear or affirm under penalty of perjury the following:

1. I am Executive Vice President of Rosebud Mining Company

("Rosebud"), Petitioner in the above-captioned case, and I have firsthand

knowledge of the facts set forth herein. I am over the age of twenty-one (21) and I
am competent to make this declaration.

2. I have been employed with Rosebud for nine years. I began employment with Rosebud in February of 2001 handling general accounting duties. In March of 2001, I became Manager of Finance & Administration. In 2008, I progressed to Executive Vice President.

3. Rosebud is a privately-held company established in 1979 that mines and processes bituminous coal from 18 deep mines and seven coal preparation plants in Pennsylvania and Ohio. Rosebud employs 1,150 individuals.

4. Rosebud is a member of the Coalition for Responsible Regulation, Inc.

5. In 2009, Rosebud produced approximately 5.4 million tons of coal, which Rosebud sold to utilities, metallurgical coal brokers, and industry for use in boilers. Approximately sixty-five percent of the coal Rosebud produced was sold to utilities for use in electricity generation; thirty-three percent was sold to metallurgical coal consumers for coke production; and the remaining two percent was sold for use in industrial boilers.

6. In 2010, however, Rosebud shifted additional resources to the development of metallurgical coal. This year, approximately forty-nine percent of the coal Rosebud is producing is sold to metallurgical coal consumers; forty-nine percent is sold to electricity generation; and two percent is sold for use in industrial boilers. One of the key factors driving this shift is the depressed market for domestic steam coal used in electricity production.

7. Rosebud's mining reserves are primarily steam coal for electricity generation. Unlike steam coal, metallurgical coal has special properties necessary for the production of coke, which is used in steel manufacturing. Out of the 500 million tons of coal reserves controlled by Rosebud, only about 100 million tons are metallurgical coal reserves. These metallurgical coal reserves are in areas that have already have been extensively mined and therefore the most valuable reserves are gone. Rosebud is essentially mining left over, unmined coal reserves that often times have poorer mining conditions than some of its steam coal mines or reserves.

8. EPA's issuance of the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) ("Endangerment Finding"), and the regulations that EPA has promulgated as a result of the Endangerment Finding, are threatening the economic viability of coal producers like Rosebud.

9. Upon issuance of the Endangerment Finding, EPA moved forward with regulating emissions of greenhouse gases from motor vehicles. On May 7, 2010, EPA and the National Highway Traffic Safety Administration ("NHTSA") issued vehicle greenhouse gas emission standards and average fuel economy standards for light-duty vehicles. 75 Fed. Reg. 25,324 (May 7, 2010). EPA maintains that this action triggered regulation of GHG under other provisions of the Clean Air Act, specifically stationary source permitting under the Prevention of Significant

Deterioration (“PSD”) and Title V programs. When the stationary source provisions are triggered, the statutory text would require all sources that emit more than 100 tons per year of carbon dioxide equivalent to apply for a Title V operating permit. New sources that emit more than 100 tons per year or 250 tons per year of carbon dioxide equivalent (depending on the source category), and sources that undertake major modifications at existing sources that are projected to increase emissions of greenhouse gases by any amount, would be required by statute to go through the PSD permitting process. *Id.* EPA has issued a Tailoring Rule that would increase these statutory thresholds for at least three years. I am aware that the Tailoring Rule and the increased thresholds are being challenged.

10. The combustion of coal, by its very nature, results in the emission of substantial amounts of carbon dioxide. EPA’s conclusions that greenhouse gases “may reasonably be anticipated both to endanger public health and to endanger public welfare,” 74 Fed. Reg. at 66,497, affects the perception of steam coal as a viable long-term source of electricity and makes coal a less desirable commodity. Moreover, I am aware that the uncertain regulatory climate is driving utility and industrial customers to switch from coal to natural gas, which is decreasing overall demand.

11. In a commodities market, even small shifts in demand can have a substantial impact on pricing of the commodity across the market. Rosebud is

seeing a reduction in market demand in coal that is translating into lower sale prices for the coal, and thus lower net income for Rosebud. Furthermore, it is becoming increasingly difficult to attract capital for the development of steam coal.

12. In large part as a result of this shift in demand and reduction in market investment that accompanies the ongoing uncertainty surrounding the long-term viability of steam coal used for electricity, Rosebud is engaged in a significant refocusing of its business on the development of metallurgical coal for export. For Rosebud, this means focusing on development of the fraction of its coal reserves that produce metallurgical coal and allowing steam coal reserves, in which Rosebud has invested millions of dollars, to remain largely undeveloped.

13. In light of the depressed long-term prospects for steam coal production, Rosebud will delay indefinitely the development of the majority of its steam coal reserves. These delays translate into lost opportunities for revenues, growth, and employment that will not be recouped unless prospects improve for the long-term viability of steam coal.

14. Rosebud's mining operations also use nearly 86 million kilowatt hours of electricity annually, which Rosebud purchases from local power producers. Rosebud spends approximately \$6.5 million annually on the purchase of electricity. In light of the substantial amount of electricity that Rosebud uses in its operations, any increase in the costs of electricity resulting from the regulation of

greenhouse gases will increase Rosebud's operating costs and reduce profitability margins.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on SEPTEMBER 10, 2010.



James R. Barker

EXHIBIT 25

Declaration of Mark G. Ellis

**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondents.

No. 09-1322 and consolidated
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COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

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UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1073 and consolidated
cases

COALITION FOR RESPONSIBLE
REGULATION, INC., ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1092 and consolidated
cases

SOUTHEASTERN LEGAL
FOUNDATION, ET AL.

Petitioners,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Respondent.

No. 10-1131 and consolidated
cases

**DECLARATION OF MARK G. ELLIS, INDUSTRIAL MINERALS
ASSOCIATION – NORTH AMERICA**

I, Mark G. Ellis, swear or affirm under penalty of perjury the following:

1. I am President of the Industrial Minerals Association – North America (“IMA-NA”), Petitioner in the above-captioned case, and I have firsthand knowledge of the facts set forth herein.

2. I am more than twenty-one (21) years of age and I am competent to make this declaration.

3. I have been with IMA-NA since February 2004.

4. IMA-NA is a trade association that represents the interests of producer member companies that extract and process industrial minerals, and associate member companies that provide goods and services to the industrial minerals industry. IMA-NA represents approximately 50 member companies that produce ball clay, barite, bentonite, borates, calcium carbonate, diatomite, feldspar, industrial sand, magnesia, mica, soda ash, talc, wollastonite, and other industrial minerals that are key components of glass, paper, cosmetics, construction materials, electronics, and numerous other materials and products. IMA-NA also represents approximately 55 associate member companies, which include equipment manufacturers, environmental consultants, trucking companies, Class I railways, and other industries that service the industrial minerals industry.

5. IMA-NA is a member of the Coalition for Responsible Regulation, Inc.

6. IMA-NA was incorporated in 2002 for the purpose of coordinating the efforts of the industrial minerals industry to address problems of common concern to the industry; to create a better understanding with the public of the problems affecting the industrial minerals industry; to protect and advance the interests of the industry; to represent and act for the industry before all divisions of

government; to undertake educational initiatives; and to act on behalf of the industry where group, rather than individual, action is more effective, desirable, and economical.

7. IMA-NA is governed by a General Assembly that consists of member company representatives from each of the industrial minerals sections, which are divided by type of mineral produced. The members of each section elect a chairman who also serves as a member of both the Board of Directors and the Executive Committee. The Executive Committee is comprised of the officers of the Association, and all industrial mineral section chairpersons who are not officers. IMA-NA has six standing committees; one of those committees, the Environmental Affairs Committee, also has a CO₂ Task Force that addresses member concerns related to the regulation of carbon dioxide.

8. Member companies must pay annual dues of between \$10,000 and \$12,500. Associate companies also are required to pay annual dues, although the dues vary.

9. IMA-NA's member companies will face substantial new regulation and increased costs as a result of the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) ("Endangerment Finding"), and the vehicle and stationary source regulation that flows from the Endangerment Finding.

10. As required by the Clean Air Act, upon issuance of the Endangerment Finding, EPA moved forward with regulating emissions of greenhouse gases (“GHGs”) from motor vehicles. On May 7, 2010, EPA and the National Highway Traffic Safety Administration (“NHTSA”) issued vehicle greenhouse gas emission standards and average fuel economy standards for light-duty vehicles. 75 Fed. Reg. 25,324 (May 7, 2010). EPA maintains that this action triggered regulation of GHG under other provisions of the Clean Air Act, specifically stationary source permitting under the Prevention of Significant Deterioration (“PSD”) and Title V programs. When the stationary source provisions are triggered, the statutory text would require all sources that emit more than 100 tons per year of carbon dioxide equivalent to apply for a Title V operating permit. New sources that emit more than 100 tons per year or 250 tons per year of carbon dioxide equivalent (depending on the source category), and sources that undertake major modifications at existing sources that are projected to increase emissions of greenhouse gases by any amount, would be required by statute to go through the PSD permitting process. *Id.*

11. On June 3, 2010, EPA published the “Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule” (the “Tailoring Rule”). 75 Fed. Reg. 31,514 (June 3, 2010). EPA proposes in its Tailoring Rule to phase-in the statutory thresholds for triggering stationary source permitting for GHG.

Pursuant to the Tailoring Rule, beginning in January 2011, new or modified sources that must undergo PSD permitting for pollutants other than greenhouse gases, but also will increase emissions of greenhouse gases by 75,000 tons per year of carbon dioxide equivalent, will trigger PSD permitting for greenhouse gases. As of July 1, 2011, new sources with the potential to emit 100,000 tons per year of carbon dioxide equivalent will be considered major sources subject to PSD review, and major modifications resulting in net greenhouse gas emissions increases of 75,000 tons per year of carbon dioxide equivalent will be subject to PSD review. Title V permitting for greenhouse gases also will be phased in: between January and July 2011, only those sources that must apply for, renew, or revise their permits for pollutants other than greenhouse gases must incorporate greenhouse gas applicable requirements into their Title V permits, and after July 2011, sources that emit more than 100,000 tons per year of carbon dioxide equivalent will be required to obtain a Title V permit. EPA states in the Tailoring Rule that it will undertake another rulemaking that will take effect by July 1, 2013, that may lower these thresholds for PSD and Title V applicability. I am aware that the Tailoring Rule and the increased thresholds are being challenged.

12. As part of the PSD permitting process, sources will be required to demonstrate that they have installed the Best Available Control Technology (“BACT”) for carbon dioxide. The process of PSD and Title V permitting for

carbon dioxide emissions, including a BACT demonstration for carbon dioxide, will require a substantial investment of time, resources, and money by IMA-NA member companies.

13. Under the statutory thresholds for emissions of carbon dioxide, most, if not all, of IMA-NA's member companies will be required to address emissions of carbon dioxide through Title V and PSD permitting.

14. For some industrial minerals, the emission of carbon dioxide is an inherent and unavoidable aspect of converting the natural feedstock into the finished product. For example, lime is produced by driving carbon dioxide from calcium carbonate. The industrial process used to produce magnesia liberates carbon dioxide from the source mineral, magnesite. All domestic soda ash is produced by driving carbon dioxide from trona or other naturally-occurring carbonate minerals. Nearly all foreign soda ash is produced by a synthetic method that does not directly use trona or carbonate minerals but nonetheless causes the unavoidable release of carbon dioxide from chemical reactions that are integral to the process. Synthetic soda ash production is much more energy intensive, and the synthetic process emits up to twice as much carbon dioxide per ton of soda ash, as compared to the natural process. IMA-NA member companies in these industries would be irreparably harmed by the EPA's greenhouse gas regulations because the

only way they could reduce the inherent emissions of carbon dioxide from these processes would be to produce less lime, soda ash, or magnesia.

15. At least eleven (11) of IMA-NA's member companies emit in excess of 25,000 tons per year of carbon dioxide equivalent. Even though 25,000 tons per year is less than the initial thresholds found in the Tailoring Rule, the suite of GHG regulations issued by the EPA creates substantial uncertainty for companies that emit 25,000 tons per year or even 100 tons per year of carbon dioxide equivalent. Such companies face the prospect of stricter and potentially inconsistent regulation by the states, the prospect of lower emissions thresholds under the upcoming July 1, 2013 modifications to the Tailoring Rule, and the prospect that the Tailoring Rule will not withstand judicial review. This uncertainty irreparably harms the IMA-NA's member companies' ability to plan and conduct business operations.

16. Few if any feasible means are available for IMA-NA member companies to reduce GHG emissions. This is true even in industries where the liberation of carbon dioxide from feedstocks is not an integral part of the production process. It is necessary to use boilers, heaters, dryers, engines, generators, compressors, and other fossil fuel combustion units to extract and process industrial minerals. Fossil fuel combustion units are widespread in the industry and the emission of carbon dioxide from such units is unavoidable. In

some cases it may be possible to switch the combustion units to fuels that are less carbon intensive than their current fuels. However, switching fuels is often not technically possible, it requires substantial capital and operating costs, it may require regulatory approval and it can result in other adverse environmental impacts. In some cases it may be possible to reduce GHG emissions through conservation or efficiency measures. However, these measures are not always possible, can require substantial capital and operating costs, and have limited effectiveness. I am aware of no other commercially-feasible means to reduce GHG emissions from IMA-NA member companies except to downsize those companies' operations, which would obviously cause irreparable harm. It is not currently possible to capture and sequester carbon on a commercial scale, and traditional emissions control devices such as scrubbers and thermal oxidizers are not effective on carbon dioxide. A number of member companies have already begun to voluntarily take those steps that are feasible to reduce their GHG emissions. The lack of options for achieving GHG reductions is likely to cause direct and irreparable harm to IMA-NA member companies by raising the costs of complying with potential BACT requirements. The lack of options for complying with GHG regulations is already harming member companies irreparably by creating uncertainty that discourages IMA-NA members from pursuing business opportunities.

17. The GHG regulations will irreparably harm IMA-NA member companies by causing their customers to switch to alternative products or to switch to foreign suppliers that are not subject to the regulations, thus causing the IMA-NA member companies to lose market share and simultaneously reducing the size of the market. In addition, IMA-NA member companies will be unable to pass the full costs of compliance to their customers and will instead be forced to absorb a portion of the compliance costs. Alternative products are available for a number of commercial applications of industrial minerals, including diatomite, magnesia, soda ash and clays. Producers of soda ash and magnesium are particularly vulnerable to foreign competition. This would also cause environmental harm because, as described above, foreign soda ash production uses a synthetic process that emits up to twice as much carbon dioxide as the natural process used domestically.

18. Furthermore, IMA-NA member companies, particularly those within the borate, calcium carbonate, feldspar, industrial sand, mica, and soda ash industries, are extremely energy intensive. Based on a survey of member companies conducted in 2008, each of these industries allocate between 30 percent and 40 percent of total expenses to electricity and other direct costs of energy.

19. In light of the substantial amount of electricity that IMA-NA member companies use in their operations, any increase in the cost of electricity resulting

from the regulation of greenhouse gases emitted from coal-fired electric generation units will increase IMA-NA member companies' costs, thereby inflicting injury on these member companies.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 9-13-10.



Mark G. Ellis

RULE 1

**74 Fed. Reg. 66,496
(Dec. 15, 2009)
(Endangerment Finding)**



Federal Register

**Tuesday,
December 15, 2009**

Part V

Environmental Protection Agency

40 CFR Chapter I

**Endangerment and Cause or Contribute
Findings for Greenhouse Gases Under
Section 202(a) of the Clean Air Act; Final
Rule**

ENVIRONMENTAL PROTECTION AGENCY**40 CFR Chapter I**

[EPA-HQ-OAR-2009-0171; FRL-9091-8]

RIN 2060-ZA14

Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act**AGENCY:** Environmental Protection Agency (EPA).**ACTION:** Final rule.

SUMMARY: The Administrator finds that six greenhouse gases taken in combination endanger both the public health and the public welfare of current and future generations. The Administrator also finds that the combined emissions of these greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas air pollution that endangers public health and welfare under CAA section 202(a). These Findings are based on careful consideration of the full weight of scientific evidence and a thorough review of numerous public comments received on the Proposed Findings published April 24, 2009.

DATES: These Findings are effective on January 14, 2010.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2009-0171. All documents in the docket are listed on the www.regulations.gov Web site. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through www.regulations.gov or in hard copy at EPA's Docket Center, Public Reading Room, EPA West Building, Room 3334, 1301 Constitution Avenue, NW., Washington, DC 20004. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

FOR FURTHER INFORMATION CONTACT:

Jeremy Martinich, Climate Change Division, Office of Atmospheric Programs (MC-6207), Environmental Protection Agency, 1200 Pennsylvania

Ave., NW., Washington, DC 20460; telephone number: (202) 343-9927; fax number: (202) 343-2202; e-mail address: ghgendangerment@epa.gov. For additional information regarding these Findings, please go to the Web site <http://www.epa.gov/climatechange/endangerment.html>.

SUPPLEMENTARY INFORMATION:**Judicial Review**

Under CAA section 307(b)(1), judicial review of this final action is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit by February 16, 2010. Under CAA section 307(d)(7)(B), only an objection to this final action that was raised with reasonable specificity during the period for public comment can be raised during judicial review. This section also provides a mechanism for us to convene a proceeding for reconsideration, “[i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of this rule.” Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, Environmental Protection Agency, Room 3000, Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20004, with a copy to the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20004.

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document.

ACUS Administrative Conference of the United States
ANPR Advance Notice of Proposed Rulemaking
APA Administrative Procedure Act
CAA Clean Air Act
CAFE Corporate Average Fuel Economy
CAIT Climate Analysis Indicators Tool
CASAC Clean Air Scientific Advisory Committee
CBI Confidential Business Information
CCSP Climate Change Science Program
CFCs chlorofluorocarbons
CFR Code of Federal Regulations
CH₄ methane
CO₂ carbon dioxide
CO₂e CO₂-equivalent
CRU Climate Research Unit

DOT U.S. Department of Transportation
EO Executive Order
EPA U.S. Environmental Protection Agency
FR Federal Register
GHG greenhouse gas
GWP global warming potential
HadCRUT Hadley Centre/Climate Research Unit (CRU) temperature record
HCFCs hydrochlorofluorocarbons
HFCs hydrofluorocarbons
IA Interim Assessment report
IPCC Intergovernmental Panel on Climate Change
MPG miles per gallon
MWP Medieval Warm Period
N₂O nitrous oxide
NAAQS National Ambient Air Quality Standards
NAICS North American Industry Classification System
NASA National Aeronautics and Space Administration
NF₃ nitrogen trifluoride
NHTSA National Highway Traffic Safety Administration
NOAA National Oceanic and Atmospheric Administration
NOI Notice of Intent
NO_x nitrogen oxides
NRC National Research Council
NSPS new source performance standards
NTTAA National Technology Transfer and Advancement Act of 1995
OMB Office of Management and Budget
PFCs perfluorocarbons
PM particulate matter
PSD Prevention of Significant Deterioration
RFA Regulatory Flexibility Act
SF₆ sulfur hexafluoride
SIP State Implementation Plan
TSD technical support document
U.S. United States
UMRA Unfunded Mandates Reform Act of 1995
UNFCCC United Nations Framework Convention on Climate Change
USGCRP U.S. Global Climate Research Program
VOC volatile organic compound(s)
WCI Western Climate Initiative
WRI World Resources Institute

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I. Introduction

A. Overview

Pursuant to CAA section 202(a), the Administrator finds that greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare. Specifically, the Administrator is defining the "air pollution" referred to in CAA section 202(a) to be the mix of six long-lived and directly-emitted greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). In this document, these six greenhouse gases are referred to as "well-mixed greenhouse gases" in this document (with more precise meanings of "long lived" and "well mixed" provided in Section IV.A).

The Administrator has determined that the body of scientific evidence compellingly supports this finding. The major assessments by the U.S. Global Climate Research Program (USGCRP), the Intergovernmental Panel on Climate Change (IPCC), and the National Research Council (NRC) serve as the primary scientific basis supporting the Administrator's endangerment finding.¹ The Administrator reached her determination by considering both observed and projected effects of greenhouse gases in the atmosphere, their effect on climate, and the public health and welfare risks and impacts associated with such climate change. The Administrator's assessment focused on public health and public welfare impacts within the United States. She also examined the evidence with respect to impacts in other world regions, and she concluded that these impacts strengthen the case for endangerment to public health and welfare because

¹ Section III of these Findings discusses the science on which these Findings are based. In addition, the Technical Support Document (TSD) accompanying these Findings summarizes the major assessments from the USGCRP, IPCC, and NRC.

impacts in other world regions can in turn adversely affect the United States.

The Administrator recognizes that human-induced climate change has the potential to be far-reaching and multi-dimensional, and in light of existing knowledge, that not all risks and potential impacts can be quantified or characterized with uniform metrics. There is variety not only in the nature and potential magnitude of risks and impacts, but also in our ability to characterize, quantify and project such impacts into the future. The Administrator is using her judgment, based on existing science, to weigh the threat for each of the identifiable risks, to weigh the potential benefits where relevant, and ultimately to assess whether these risks and effects, when viewed in total, endanger public health or welfare.

The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public health by evaluating the risks associated with changes in air quality, increases in temperatures, changes in extreme weather events, increases in food- and water-borne pathogens, and changes in aeroallergens. The evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding.

The impact on mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves, also provides support for a public health endangerment finding. There are uncertainties over the net health impacts of a temperature increase due to decreases in cold-related mortality, but some recent evidence suggests that the net impact on mortality is more likely to be adverse, in a context where heat is already the leading cause of weather-related deaths in the United States.

The evidence concerning how human-induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be

adversely affected by an increase in the severity of coastal storm events due to rising sea levels.

There is some evidence that elevated carbon dioxide concentrations and climate changes can lead to changes in aeroallergens that could increase the potential for allergenic illnesses. The evidence on pathogen borne disease vectors provides directional support for an endangerment finding. The Administrator acknowledges the many uncertainties in these areas. Although these adverse effects provide some support for an endangerment finding, the Administrator is not placing primary weight on these factors.

Finally, the Administrator places weight on the fact that certain groups, including children, the elderly, and the poor, are most vulnerable to these climate-related health effects.

The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public welfare by evaluating numerous and far-ranging risks to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy, infrastructure, and settlements, and ecosystems and wildlife. For each of these sectors, the evidence provides support for a finding of endangerment to public welfare. The evidence concerning adverse impacts in the areas of water resources and sea level rise and coastal areas provides the clearest and strongest support for an endangerment finding, both for current and future generations. Strong support is also found in the evidence concerning infrastructure and settlements, as well ecosystems and wildlife. Across the sectors, the potential serious adverse impacts of extreme events, such as wildfires, flooding, drought, and extreme weather conditions, provide strong support for such a finding.

Water resources across large areas of the country are at serious risk from climate change, with effects on water supplies, water quality, and adverse effects from extreme events such as floods and droughts. Even areas of the country where an increase in water flow is projected could face water resource problems from the supply and water quality problems associated with temperature increases and precipitation variability, as well as the increased risk of serious adverse effects from extreme events, such as floods and drought. The severity of risks and impacts is likely to increase over time with accumulating greenhouse gas concentrations and associated temperature increases and precipitation changes.

Overall, the evidence on risk of adverse impacts for coastal areas

provides clear support for a finding that greenhouse gas air pollution endangers the welfare of current and future generations. The most serious potential adverse effects are the increased risk of storm surge and flooding in coastal areas from sea level rise and more intense storms. Observed sea level rise is already increasing the risk of storm surge and flooding in some coastal areas. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. Even if there is a low probability of raising the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution. In addition, coastal areas face other adverse impacts from sea level rise such as land loss due to inundation, erosion, wetland submergence, and habitat loss. The increased risk associated with these adverse impacts also endangers public welfare, with an increasing risk of greater adverse impacts in the future.

Strong support for an endangerment finding is also found in the evidence concerning energy, infrastructure, and settlements, as well ecosystems and wildlife. While the impacts on net energy demand may be viewed as generally neutral for purposes of making an endangerment determination, climate change is expected to result in an increase in electricity production, especially supply for peak demand. This may be exacerbated by the potential for adverse impacts from climate change on hydropower resources as well as the potential risk of serious adverse effects on energy infrastructure from extreme events. Changes in extreme weather events threaten energy, transportation, and water resource infrastructure. Vulnerabilities of industry, infrastructure, and settlements to climate change are generally greater in high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Climate change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental and cultural impacts on their historic lifestyles. Over the 21st

century, changes in climate will cause some species to shift north and to higher elevations and fundamentally rearrange U.S. ecosystems. Differential capacities for range shifts and constraints from development, habitat fragmentation, invasive species, and broken ecological connections will likely alter ecosystem structure, function, and services, leading to predominantly negative consequences for biodiversity and the provision of ecosystem goods and services.

There is a potential for a net benefit in the near term² for certain crops, but there is significant uncertainty about whether this benefit will be achieved given the various potential adverse impacts of climate change on crop yield, such as the increasing risk of extreme weather events. Other aspects of this sector may be adversely affected by climate change, including livestock management and irrigation requirements, and there is a risk of adverse effect on a large segment of the total crop market. For the near term, the concern over the potential for adverse effects in certain parts of the agriculture sector appears generally comparable to the potential for benefits for certain crops. However, The body of evidence points towards increasing risk of net adverse impacts on U.S. food production and agriculture over time, with the potential for significant disruptions and crop failure in the future.

For the near term, the Administrator finds the beneficial impact on forest growth and productivity in certain parts of the country from elevated carbon dioxide concentrations and temperature increases to date is offset by the clear risk from the observed increases in wildfires, combined with risks from the spread of destructive pests and disease. For the longer term, the risk from adverse effects increases over time, such that overall climate change presents serious adverse risks for forest productivity. There is compelling reason to find that the support for a positive endangerment finding increases as one considers expected future conditions where temperatures continue to rise.

Looking across all of the sectors discussed above, the evidence provides compelling support for finding that greenhouse gas air pollution endangers the public welfare of both current and

² The temporal scope of impacts is discussed in more detail in Section III.C. The phrase "near term" as used in this document generally refers to the current time period from and the next few decades. The phrase "long term" generally refers to a time frame extending beyond that to approximately the middle to the end of this century.

future generations. The risk and the severity of adverse impacts on public welfare are expected to increase over time.

The Administrator also finds that emissions of well-mixed greenhouse gases from the transportation sources covered under CAA section 202(a)³ contribute to the total greenhouse gas air pollution, and thus to the climate change problem, which is reasonably anticipated to endanger public health and welfare. The Administrator is defining the air pollutant that contributes to climate change as the aggregate group of the well-mixed greenhouse gases. The definition of air pollutant used by the Administrator is based on the similar attributes of these substances. These attributes include the fact that they are sufficiently long-lived to be well mixed globally in the atmosphere, that they are directly emitted, and that they exert a climate warming effect by trapping outgoing, infrared heat that would otherwise escape to space, and that they are the focus of climate change science and policy.

In order to determine if emissions of the well-mixed greenhouse gases from CAA section 202(a) source categories contribute to the air pollution that endangers public health and welfare, the Administrator compared the emissions from these CAA section 202(a) source categories to total global and total U.S. greenhouse gas emissions, finding that these source categories are responsible for about 4 percent of total global well-mixed greenhouse gas emissions and just over 23 percent of total U.S. well-mixed greenhouse gas emissions. The Administrator found that these comparisons, independently and together, clearly establish that these emissions contribute to greenhouse gas concentrations. For example, the emissions of well-mixed greenhouse gases from CAA section 202(a) sources are larger in magnitude than the total well-mixed greenhouse gas emissions from every other individual nation with the exception of China, Russia, and India, and are the second largest emitter within the United States behind the electricity generating sector. As the Supreme Court noted, “[j]udged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence, * * * to global warming.” *Massachusetts v. EPA*, 549 U.S. 497, 525 (2007).

³ Section 202(a) source categories include passenger cars, heavy-, medium and light-duty trucks, motorcycles, and buses.

The Administrator’s findings are in response to the Supreme Court’s decision in *Massachusetts v. EPA*. That case involved a 1999 petition submitted by the International Center for Technology Assessment and 18 other environmental and renewable energy industry organizations requesting that EPA issue standards under CAA section 202(a) for the emissions of carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons from new motor vehicles and engines. The Administrator’s findings are in response to this petition and are for purposes of CAA section 202(a).

B. Background Information Helpful To Understand These Findings

This section provides some basic information regarding greenhouse gases and the CAA section 202(a) source categories, as well as the ongoing joint-rulemaking on greenhouse gases by EPA and the Department of Transportation. Additional technical and legal background, including a summary of the Supreme Court’s *Massachusetts v. EPA* decision, can be found in the Proposed Endangerment and Contribution Findings (74 FR 18886, April 24, 2009).

1. Greenhouse Gases and Transportation Sources Under CAA Section 202(a)

Greenhouse gases are naturally present in the atmosphere and are also emitted by human activities. Greenhouse gases trap the Earth’s heat that would otherwise escape from the atmosphere, and thus form the greenhouse effect that helps keep the Earth warm enough for life. Human activities are intensifying the naturally-occurring greenhouse effect by adding greenhouse gases to the atmosphere. The primary greenhouse gases of concern that are directly emitted by human activities include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Other pollutants (such as aerosols) and other human activities, such as land use changes that alter the reflectivity of the Earth’s surface, also cause climatic warming and cooling effects. In these Findings, the term “climate change” generally refers to the global warming effect plus other associated changes (e.g., precipitation effects, sea level rise, changes in the frequency and severity of extreme weather events) being induced by human activities, including activities that emit greenhouse gases. Natural causes also, contribute to climate change and climatic changes have occurred throughout the Earth’s history. The concern now, however, is that the changes taking place in our atmosphere

as a result of the well-documented buildup of greenhouse gases due to human activities are changing the climate at a pace and in a way that threatens human health, society, and the natural environment. Further detail on the state of climate change science can be found in Section III of these Findings as well as the technical support document (TSD) that accompanies this action (www.epa.gov/climatechange/endangerment.html).

The transportation sector is a major source of greenhouse gas emissions both in the United States and in the rest of the world. The transportation sources covered under CAA section 202(a)—the section of the CAA under which these Findings occur—include passenger cars, light- and heavy-duty trucks, buses, and motorcycles. These transportation sources emit four key greenhouse gases: carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons. Together, these transportation sources are responsible for 23 percent of total annual U.S. greenhouse gas emissions, making this source the second largest in the United States behind electricity generation.⁴

Further discussion of the emissions data supporting the Administrator’s cause or contribute finding can be found in Section V of these Findings, and the detailed greenhouse gas emissions data for section 202(a) source categories can be found in Appendix B of EPA’s TSD.

2. Joint EPA and Department of Transportation Proposed Greenhouse Gas Rule

On September 15, 2009, EPA and the Department of Transportation’s National Highway Safety Administration (NHTSA) proposed a National Program that would dramatically reduce greenhouse gas emissions and improve fuel economy for new cars and trucks sold in the United States. The combined EPA and NHTSA standards that make up this proposed National Program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They proposed to require these vehicles to meet an estimated combined average

⁴ The units for greenhouse gas emissions in these findings are provided in carbon dioxide equivalent units, where carbon dioxide is the reference gas and every other greenhouse gas is converted to its carbon dioxide equivalent by using the 100-year global warming potential (as estimated by the Intergovernmental Panel on Climate Change (IPCC), assigned to each gas. The reference gas used is CO₂, and therefore Global Warming Potential (GWP)-weighted emissions are measured in teragrams of CO₂ equivalent (Tg CO₂ eq.). In accordance with UNFCCC reporting procedures, the United States quantifies greenhouse gas emissions using the 100-year time frame values for GWPs established in the IPCC Second Assessment Report.

emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon (MPG) if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these proposed standards would cut carbon dioxide emissions by an estimated 950 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The proposed rulemaking can be viewed at (74 FR 49454, September 28, 2009).

C. Public Involvement

In response to the Supreme Court's decision, EPA has been examining the scientific and technical basis for the endangerment and cause or contribute decisions under CAA section 202(a) since 2007. The science informing the decision-making process has grown stronger since our work began. EPA's approach to evaluating the science, including comments submitted during the public comment period, is further discussed in Section III.A of these Findings. Public review and comment has always been a major component of EPA's process.

1. EPA's Initial Work on Endangerment

As part of the *Advance Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions under the Clean Air Act* (73 FR 44353) published in July 2008, EPA provided a thorough discussion of the issues and options pertaining to endangerment and cause or contribute findings under the CAA. The Agency also issued a TSD providing an overview of all the major scientific assessments available at the time and emission inventory data relevant to the contribution finding (Docket ID No. EPA–HQ–OAR–2008–0318). The comment period for that *Advance Notice* was 120 days, and it provided an opportunity for EPA to hear from the public with regard to the issues involved in endangerment and cause or contribute findings as well as the supporting science. EPA received, reviewed and considered numerous comments at that time and this public input was reflected in the Findings that the Administrator proposed in April 2009. In addition, many comments were received on the TSD released with the *Advance Notice* and reflected in revisions to the TSD released in April 2009 to accompany the Administrator's proposal. All public comments on the *Advance Notice* are contained in the public docket for this action (Docket ID No. EPA–HQ–OAR–2008–0318) accessible through www.regulations.gov.

2. Public Involvement Since the April 2009 Proposed Endangerment Finding

The Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases (Proposed Findings) was published on April 24, 2009 (74 FR 18886). The Administrator's proposal was subject to a 60-day public comment period, which ended June 23, 2009, and also included two public hearings. Over 380,000 public comments were received on the Administrator's proposed endangerment and cause or contribute findings, including comments on the elements of the Administrator's April 2009 proposal, the legal issues pertaining to the Administrator's decisions, and the underlying TSD containing the scientific and technical information.

A majority of the comments (approximately 370,000) were the result of mass mail campaigns, which are defined as groups of comments that are identical or very similar in form and content. Overall, about two-thirds of the mass-mail comments received are supportive of the Findings and generally encouraged the Administrator both to make a positive endangerment determination and implement greenhouse gas emission regulations. Of the mass mail campaigns in disagreement with the Proposed Findings most either oppose the proposal on economic grounds (e.g., due to concern for regulatory measures following an endangerment finding) or take issue with the proposed finding that atmospheric greenhouse gas concentrations endanger public health and welfare. Please note that for mass mailer campaigns, a representative copy of the comment is posted in the public docket for this Action (Docket ID No. EPA–HQ–OAR–2009–0171) at www.regulations.gov.

Approximately 11,000 other public comments were received. These comments raised a variety of issues related to the scientific and technical information EPA relied upon in making the Proposed Findings, legal and procedural issues, the content of the Proposed Findings, and the implications of the Proposed Findings.

In light of the very large number of comments received and the significant overlap between many comments, EPA has not responded to each comment individually. Rather, EPA has summarized and provided responses to each significant argument, assertion and question contained within the totality of the comments. EPA's responses to some of the most significant comments are provided in these Findings. Responses to all significant issues raised by the

comments are contained in the 11 volumes of the Response to Comments document, organized by subject area (found in docket EPA–HQ–OAR–2009–0171).

3. Issues Raised Regarding the Rulemaking Process

EPA received numerous comments on process-related issues, including comments urging the Administrator to delay issuing the final findings, arguing that it was improper for the Administrator to sever the endangerment and cause or contribute findings from the attendant section 202(a) standards, arguing the final decision was preordained by the President's May vehicle announcement, and questioning the adequacy of the comment period. Summaries of key comments and EPA's responses are discussed in this section. Additional and more detailed responses can be found in the Response to Comments document, Volume 11. As noted in the Response to Comments document, EPA also received comments supporting the overall process.

a. It Is Reasonable for the Administrator To Issue the Endangerment and Cause or Contribute Findings Now

Though the Supreme Court did not establish a specific deadline for EPA to act, more than two and a half years have passed since the remand from the Supreme Court, and it has been 10 years since EPA received the original petition requesting that EPA regulate greenhouse gas emissions from new motor vehicles. EPA has a responsibility to respond to the Supreme Court's decision and to fulfill its obligations under current law, and there is good reason to act now given the urgency of the threat of climate change and the compelling scientific evidence.

Many commenters urge EPA to delay making final findings for a variety of reasons. They note that the Supreme Court did not establish a deadline for EPA to act on remand. Commenters also argue that the Supreme Court's decision does not require that EPA make a final endangerment finding, and thus that EPA has discretionary power and may decline to issue an endangerment finding, not only if the science is too uncertain, but also if EPA can provide "some reasonable explanation" for exercising its discretion. These commenters interpret the Supreme Court decision not as rejecting all policy reasons for declining to undertake an endangerment finding, but rather as dismissing solely the policy reasons EPA set forth in 2003. Some commenters cite language in the

Supreme Court decision regarding EPA's discretion regarding "the manner, timing, content, and coordination of its regulations," and the Court's declining to rule on "whether policy concerns can inform EPA's actions in the event that it makes" a CAA section 202(a) finding to support their position.

Commenters then suggest a variety of policy reasons that EPA can and should make to support a decision not to undertake a finding of endangerment under CAA section 202(a)(1). For example, they argue that a finding of endangerment would trigger several other regulatory programs—such as the Prevention of Significant Deterioration (PSD) provisions—that would impose an unreasonable burden on the economy and government, without providing a benefit to the environment. Some commenters contend that EPA should defer issuing a final endangerment finding while Congress considers legislation. Many commenters note the ongoing international discussions regarding climate change and state their belief that unilateral EPA action would interfere with those negotiations. Others suggest deferring the EPA portion of the joint U.S. Department of Transportation (DOT)/EPA rulemaking because they argue that the new Corporate Average Fuel Economy (CAFE) standards will effectively result in lower greenhouse gas emissions from new motor vehicles, while avoiding the inevitable problems and concerns of regulating greenhouse gases under the CAA.

Other commenters argue that the endangerment determination has to be made on the basis of scientific considerations only. These commenters state that the Court was clear that "[t]he statutory question is whether sufficient information exists to make an endangerment finding," and thus, only if "the scientific uncertainty is so profound that it precludes EPA from making a reasoned judgment as to whether greenhouse gases contribute to global warming," may EPA avoid making a positive or negative endangerment finding. Many commenters urge EPA to take action quickly. They note that it has been 10 years since the original petition requesting that EPA regulate greenhouse gas emissions from motor vehicles was submitted to EPA. They argue that climate change is a serious problem that requires immediate action.

EPA agrees with the commenters who argue that the Supreme Court decision held that EPA is limited to consideration of science when undertaking an endangerment finding, and that we cannot delay issuing a finding due to policy concerns if the

science is sufficiently certain (as it is here). The Supreme Court stated that "EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do" 549 U.S. at 533. Some commenters point to this last provision, arguing that the policy reasons they provide are a "reasonable explanation" for not moving forward at this time. However, this ignores other language in the decision that clearly indicates that the Court interprets the statute to allow for the consideration only of science. For example, in rejecting the policy concerns expressed by EPA in its 2003 denial of the rulemaking petition, the Court noted that "it is evident [the policy considerations] have nothing to do with whether greenhouse gas emissions contribute to climate change. Still less do they amount to a reasoned justification for declining to form a *scientific judgment*" *Id.* at 533–34 (emphasis added).

Moreover, the Court also held that "[t]he statutory question is whether sufficient information exists to make an endangerment finding" *Id.* at 534. Taken as a whole, the Supreme Court's decision clearly indicates that policy reasons do not justify the Administrator avoiding taking further action on the question here.

We also note that the language many commenters quoted from the Supreme Court decision about EPA's discretion regarding the manner, timing and content of Agency actions, and the ability to consider policy concerns, relate to the motor vehicle standards required in the event that EPA makes a positive endangerment finding, and not the finding itself. EPA has long taken the position that it does have such discretion in the standard-setting step under CAA section 202(a).

b. The Administrator Reasonably Proceeded With the Endangerment and Cause or Contribute Findings Separate From the CAA Section 202(a) Standard Rulemaking

As discussed in the Proposed Findings, typically endangerment and cause or contribute findings have been proposed concurrently with proposed standards under various sections of the CAA, including CAA section 202(a). EPA received numerous comments on its decision to propose the endangerment and cause or contribute findings separate from any standards under CAA section 202(a).

Commenters argue that EPA has no authority to issue an endangerment

determination under CAA section 202(a) separate and apart from the rulemaking to establish emissions standards under CAA section 202(a). According to these commenters, CAA section 202(a) provides only one reason to issue an endangerment determination, and that is as the basis for promulgating emissions standards for new motor vehicles; thus, it does not authorize such a stand-alone endangerment finding, and EPA may not create its own procedural rules completely divorced from the statutory text. They continue by stating that while CAA section 202(a) says EPA may issue emissions standards conditioned on such a finding, it does not say EPA may first issue an endangerment determination and then issue emissions standards. In addition, they contend, the endangerment proposal and the emissions standards proposal need to be issued together so commenters can fully understand the implications of the endangerment determination. Failure to do so, they argue, deprives the commenters of the opportunity to assess the regulations that will presumably follow from an endangerment finding. They also argue that the expected overlap between reductions in emissions of greenhouse gases from CAA section 202(a) standards issued by EPA and CAFE standards issued by DOT calls into question the basis for the CAA section 202(a) standards and the related endangerment finding, and that EPA is improperly motivated by an attempt to trigger a cascade of regulations under the CAA and/or to promote legislation by Congress.

EPA disagrees with the commenters' claims and arguments. The text of CAA section 202(a) is silent on this issue. It does not specify the timing of an endangerment finding, other than to be clear that emissions standards may not be issued unless such a determination has been made. EPA is exercising the procedural discretion that is provided by CAA section 202(a)'s lack of specific direction. The text of CAA section 202(a) envisions two separate actions by the Administrator: (1) A determination on whether emissions from classes or categories of new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger, and (2) a separate decision on issuance of appropriate emissions standards for such classes or categories. The procedure followed in this rulemaking, and the companion rulemaking involving emissions standards for light duty motor vehicles, is consistent with CAA section 202(a). EPA will issue final emissions standards for new motor

vehicles only if affirmative findings are made concerning contribution and endangerment, and such emissions standards will not be finalized prior to making any such determinations. While it would also be consistent with CAA section 202(a) to issue the greenhouse gas endangerment and contribution findings and emissions standards for new light-duty vehicles in the same rulemaking, *e.g.*, a single proposal covering them and a single final rule covering them, nothing in CAA section 202(a) requires such a procedural approach, and nothing in the approach taken in this case violates the text of CAA section 202(a). Since Congress was silent on this issue, and more than one procedural approach may accomplish the requirements of CAA section 202(a), EPA has the discretion to use the approach considered appropriate in this case. Once the final affirmative contribution and endangerment findings are made, EPA has the authority to issue the final emissions standards for new light-duty motor vehicles; however, as the Supreme Court has noted, the agency has ‘significant latitude as to the manner, timing, [and] content * * * of its regulations.’ * * * *Massachusetts v. EPA*, 549 U.S. at 533. That includes the discretion to issue them in a separate rulemaking.

Commenters’ argument would also lead to the conclusion that EPA could not make an endangerment finding for the entire category of new motor vehicles, as it is doing here, unless EPA also conducted a rulemaking that set emissions standards for all the classes and categories of new motor vehicles at the same time. This narrow procedural limitation would improperly remove discretion that CAA section 202(a) provides to EPA.

EPA has the discretion under CAA section 202(a) to consider classes or categories of new motor vehicles separately or together in making a contribution and endangerment determination. This discretion would be removed under commenters’ interpretation, by limiting this to only those cases in which EPA was also ready to issue emissions standards for all of the classes or categories covered by the endangerment finding. However, nothing in the text of CAA section 202(a) places such a limit on EPA’s discretion in determining how to group classes or categories of new motor vehicles for purposes of the contribution and endangerment findings. This limitation would not be appropriate, because the issues of contribution and endangerment are separate and distinct from the issues of setting emissions standards. EPA, in this case, is fully

prepared to go forward with the contribution and endangerment determination, while it is not ready to proceed with rulemaking for each and every category of new motor vehicles in the first rulemaking to set emissions standards. Section 202(a) of the CAA provides EPA discretion with regard to when and how it conducts its rulemakings to make contribution and endangerment findings, and to set emissions standards, and the text of CAA section 202(a) does not support commenters attempt to limit such discretion.

Concerns have been raised that the failure to issue the proposed endangerment finding and the proposed emissions standard together preclude commenters from assessing and considering the implications of the endangerment finding and the regulations that would likely flow from such a finding. However, commenters have failed to explain how this interferes in any way with their ability to comment on the endangerment finding. In fact it does not interfere, because the two proposals address separate and distinct issues. The endangerment finding concerns the contribution of new motor vehicles to air pollution and the effect of that air pollution on public health or welfare. The emissions standards, which have been proposed (74 FR 49454, September 28, 2009), concern the appropriate regulatory emissions standards if affirmative findings are made on contribution and endangerment. These two proposals address different issues. While commenters have the opportunity to comment on the proposed emissions standards in that rulemaking, they have not shown, and cannot show, that they need to have the emissions standards proposal before them in order to provide relevant comments on the proposed contribution or endangerment findings. Further discussion of this issue can be found in Section II of these Findings, and discussion of the timing of this action and its relationship to other CAA provisions and Congressional action can be found in Section III of these Findings and Volume 11 of the Response to Comments document.

c. The Administrator’s Final Decision Was Not Preordained by the President’s May Vehicle Announcement

EPA received numerous comments arguing that the President’s announcement of a new “National Fuel Efficiency Policy” on May 19, 2009 seriously undermines EPA’s ability to provide objective consideration of and a legally adequate response to comments

objecting to the previously proposed endangerment findings.

Commenters’ conclusion is based on the view that the President’s announced policy requires EPA to promulgate greenhouse gas emissions standards under CAA section 202(a), that the President’s and Administrator Jackson’s announcement indicated that the endangerment rulemaking was but a formality and that a final endangerment finding was a *fait accompli*. Commenters argue that this means the result of this rulemaking has been preordained and the merits of the issues have been prejudged.

EPA disagrees. Commenters’ arguments wholly exaggerate and mischaracterize the circumstances. In the April 24, 2009 endangerment proposal EPA was clear that the two steps in the endangerment provision have to be satisfied in order for EPA to issue emissions standards for new motor vehicles under CAA section 202(a) (74 FR at 18888, April 24, 2009). This was repeated when EPA issued the Notice of Upcoming Joint Rulemaking to Establish Vehicle GHG Emissions and CAFE Standards (74 FR 24007 May 22, 2009) (Notice of Intent or NOI). This was repeated again when EPA issued proposed greenhouse gas emissions standards for certain new motor vehicles (74 FR 49454, September 28, 2009). EPA has consistently made it clear that issuance of new motor vehicle standards requires and is contingent upon satisfaction of the two-part endangerment test.

On May 19, 2009 EPA issued the joint Notice of Intent, which indicated EPA’s intention to propose new motor vehicle standards. All of the major motor vehicle manufacturers, their trade associations, the State of California, and several environmental organizations announced their full support for the upcoming rulemaking. Not surprisingly, on the same day the President also announced his full support for this action. Commenters, however, erroneously equate this Presidential support with a Presidential directive that requires EPA to prejudge and preordain the result of this rulemaking.

The only evidence they point to are simply indications of Presidential support. Commenters point to a press release, which unsurprisingly refers to the Agency’s announcement as delivering on the President’s commitment to enact more stringent fuel economy standards, by bringing “all stakeholders to the table and [coming] up with a plan” for solving a serious problem. The plan that was announced, of course, was a plan to conduct notice and comment

rulemaking. The press release itself states that President Obama “set in motion a new national policy,” with the policy “aimed” at reducing greenhouse gas emissions for new cars and trucks. What was “set in motion” was a notice and comment rulemaking described in the NOI issued by EPA on the same day. Neither the President nor EPA announced a final rule or a final direction that day, but instead did no more than announce a plan to go forward with a notice and comment rulemaking. That is how the plan “delivers on the President’s commitment” to enact more stringent standards. The announcement was that a notice and comment rulemaking would be initiated with the aim of adopting certain emissions standards.

That is no different from what EPA or any other agency states when it issues a notice of proposed rulemaking. It starts a process that has the aim of issuing final regulations if they are deemed appropriate at the end of the public process. The fact that an Agency proposes a certain result, and expects that a final rule will be the result of setting such a process in motion, is the ordinary course of affairs in notice and comment rulemakings. This does not translate into prejudging the final result or having a preordained result that de facto negates the public comment process. The President’s press release of May 19, 2009 was a recognition that this notice and comment rulemaking process would be set in motion, as well as providing his full support for the Agency to go forward in this direction; it was no more than that.

The various stakeholders who announced their support for the plan that had been set in motion all recognized that full notice and comment rulemaking was part of the plan, and they all reserved their rights to participate in such notice and comment rulemaking. For example, see the letter of support from Ford Motor Company, which states that “Ford fully supports proposal and adoption of such a National Program, which we understand will be subject to full notice-and-comment rulemaking, affording all interested parties including Ford the right to participate fully, comment, and submit information, the results of which are not pre-determined but depend upon processes set by law.”

d. The Notice and Comment Period Was Adequate

Many commenters argue that the 60-day comment period was inadequate. Commenters claim that a 60-day period was insufficient time to fully evaluate the science and other information that

informed the Administrator’s proposal. Some commenters assert that because the comment period for the Proposed Finding substantially overlapped with the comment period for the Mandatory Greenhouse Gas Reporting Rule, as well as Congress’ consideration of climate legislation, their ability to fully participate in the notice and comment period was “seriously compromised.” Moreover, they continue, because EPA had not yet proposed CAA section 202(a) standards, there was no valid reason to fail to extend the comment period. Several commenters and other entities had also requested that EPA extend the comment period.

Some commenters assert that the notice provided by this rulemaking was “defective” because the **Federal Register** notice announcing the proposal had an error in the e-mail address for the docket. At least one commenter suggests that this error deprives potential commenters of their Due Process under the Fifth Amendment of the Constitution, citing *Armstrong v. Manzo*, 380 U.S. 545, 552 (1965), and that failure to “correct” the minor typographical error in the e-mail address and extend the comment period would make the rule “subject to reversal” in violation of the CAA, Administrative Procedure Act (APA), the Due Process clause of the Constitution, and EO 12866.

Finally, for many of the same reasons that commenters argue a 60-day comment period was inadequate, several commenters request that EPA reopen and/or extend the comment period. One commenter requests that the comment period be reopened because there was new information regarding data used by EPA in the Proposed Findings. In particular, the commenter alleges that it recently became aware that one of the sources of global climate data had destroyed the raw data for its data set of global surface temperatures. The commenter argues that this alleged destruction of raw data violates scientific standards, calls into question EPA’s reliance on that data in these Findings, and necessitates a reopening of the proceedings. Other commenters request that the comment period be extended and/or reopened due to the release of a Federal government document on the impact of climate change in the United States near the end of the comment period, as well as the release of an internal EPA staff document discussing the science.

The official public comment period on the proposed rule was adequate. First, a 60-day comment period satisfies the procedural requirements of CAA section 307 of the CAA, which requires

a 30-day comment period, and that the docket be kept open to receive rebuttal or supplemental information as follow-up to any hearings for 30 days following the hearings. EPA met those obligations here—the comment period opened on April 24, 2009, the last hearing was on May 21, 2009 and the comment period closed June 23, 2009.

Second, as explained in letters denying requests to extend the comment period, a very large part of the information and analyses for the Proposed Findings had been previously released in July 30, 2008, as part of the *Advance Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions under the Clean Air Act (ANPR)* (73 FR 44353). The public comment period for the ANPR is discussed above in Section I.C.1 of these Findings. The Administrator explained that the comment period for that ANPR was 120 days and that the major recent scientific assessments that EPA relied upon in the TSD released with the ANPR had previously each gone through their own public review processes and have been publicly available for some time. In other words, EPA has provided ample time for review, particularly with regard to the technical support for the Findings. See, for example, EPA Letter to Congressman Issa dated June 17, 2009, a copy of which is available at <http://epa.gov/climatechange/endangerment.html>.

Moreover, the comment period was not rendered insufficient merely because other climate-related proceedings were occurring simultaneously.

While one commenter suggests that the convergence of several different climate-related activities has “seriously compromised” their ability to participate in the comment process, that commenter was able to submit an 89 page comment on this proposal alone. Moreover, it is hardly rare that more than one rule is out for comment at the same time. As noted above, EPA has received a substantial number of significant comments on the Proposed Findings, and has thoroughly considered and responded to significant comments.

EPA finds no evidence that a typographical error in the docket e-mail address of the **Federal Register** notice announcing the proposal prevented the public from having a meaningful opportunity to comment, and therefore deprived them of due process. Although the minor error—which involved a word processing auto-correction that turned a short dash into a long dash—appeared in the FR version of the Proposed Findings, the e-mail address is correct

in the signature version of the Proposed Findings posted on EPA's Web site until publication in the **Federal Register**, and in the "Instructions for Submitting Written Comments" document on the Web site for the rulemaking. EPA has received over 190,000 e-mails to the docket e-mail address to date, so the minor typographical error appearing in only one location has not been an impediment to interested parties' e-mailing comments. Moreover, EPA provided many other avenues for interested parties to submit comments in addition to the docket e-mail address, including via www.regulations.gov, mail, and fax; each of these options have been utilized by many commenters. EPA is confident that the minor typographical error did not prevent anyone from submitting written comments, by e-mail or otherwise, and that the public was provided "meaningful participation in the regulatory process" as mentioned in EO 12866.

Our response regarding the request to reopen the comment period due to concerns about alleged destruction of raw global surface data is discussed more fully in the Response to Comments document, Volume 11. The commenter did not provide any compelling reason to conclude that the absence of these data would materially affect the trends in the temperature records or conclusions drawn about them in the assessment literature and reflected in the TSD. The Hadley Centre/Climate Research Unit (CRU) temperature record (referred to as HadCRUT) is just one of three global surface temperature records that EPA and the assessment literature refer to and cite. National Oceanic and Atmospheric Administration (NOAA) and National Aeronautics and Space Administration (NASA) also produce temperature records, and all three temperature records have been extensively peer reviewed. Analyses of the three global temperature records produce essentially the same long-term trends as noted in the Climate Change Science Program (CCSP) (2006) report "Temperature Trends in the Lower Atmosphere," IPCC (2007), and NOAA's study⁵ "State of the Climate in 2008". Furthermore, the commenter did not demonstrate that the allegedly destroyed data would materially alter the HadCRUT record or meaningfully hinder its replication. The raw data, a small part of which has not been public (for reasons described at: [http://www.uea.ac.uk/mac/comm/media/](http://www.uea.ac.uk/mac/comm/media/press/2009/nov/CRUupdate)

[press/2009/nov/CRUupdate](http://www.uea.ac.uk/mac/comm/media/press/2009/nov/CRUupdate)), are available in a quality-controlled (or homogenized, value-added) format and the methodology for developing the quality-controlled data is described in the peer reviewed literature (as documented at <http://www.cru.uea.ac.uk/cru/data/temperature/>).

The release of the U.S. Global Climate Research Program (USGCRP) report on impacts of climate change in the United States in June 2009 also did not necessitate extending the comment period. This report was issued by the USGCRP, formerly the Climate Change Science Program (CCSP), and synthesized information contained in prior CCSP reports and other synthesis reports, many of which had already been published (and were included in the TSD for the Proposed Findings). Further, the USGCRP report itself underwent notice and comment before it was finalized and released.

Regarding the internal EPA staff paper that came to light during the comment period, several commenters submitted a copy of the EPA staff paper with their comments; EPA's response to the issues raised by the staff paper are discussed in the Response to Comments document, Volume 1. The fact that some internal agency deliberations were made public during the comment period does not in and of itself call into question those deliberations. As our responses to comments explain, EPA considered the concerns noted in the staff paper during the proposal stage, as well as when finalizing the Findings. There was nothing about those internal comments that required an extension or reopening of the comment period.

Thus, the opportunity for comment fully satisfies the CAA and Constitutional requirement of Due Process. Cases cited by commenters do not indicate otherwise. The comment period and thorough response to comment documents in the docket indicate that EPA has given people an opportunity to be heard in a "meaningful time and a meaningful matter." *Armstrong v. Manzo*, 380 U.S. 545, 552 (1965). Interested parties had full notice of the rulemaking proceedings and a significant opportunity to participate through the comment process and multiple hearings.

For all the above reasons, EPA's denial of the requests for extension or reopening of the comment period was entirely reasonable in light of the extensive opportunity for public comment and heavy amount of public participation during the comment period. EPA has fully complied with all

applicable public participation requirements for this rulemaking.

e. These Findings Did Not Necessitate a Formal Rulemaking Under the Administrative Procedure Act

One commenter, with the support of others, requests that EPA undertake a formal rulemaking process for the Findings, on the record, in accordance with the procedures described in sections 556–557 of the Administrative Procedure Act (APA). The commenter requests a multi-step process, involving additional public notice, an on-the-record proceeding (e.g., formal administrative hearing) with the right of appeal, utilization of the Clean Air Scientific Advisory Committee (CASAC) and its advisory proceedings, and designation of representatives from other executive branch agencies to participate in the formal proceeding and any CASAC advisory proceeding.

The commenter asserts that while EPA is not obligated under the CAA to undertake these additional procedures, the Agency nonetheless has the legal authority to engage in such a proceeding. The commenter believes this proceeding would show that EPA is "truly committed to scientific integrity and transparency." The commenter cites several cases to argue that refusal to proceed on the record would be "arbitrary and capricious" or would be an "abuse of discretion." The allegation at the core of the commenter's argument is that profound and wide-ranging scientific uncertainties exist in the Proposed Findings and in the impacts on health and welfare discussed in the TSD. To support this argument, the commenter provides lengthy criticisms of the science. The commenter also argues that the regulatory cascade that would be "unleashed" by a positive endangerment finding warrants the more formal proceedings.

Finally, the commenter suggests that EPA engage in "formal rulemaking" procedures in part due to the Administrative Conference of the United States' (ACUS) recommended factors for engaging in formal rulemaking. The commenter argues that the current action is "complex," "open-ended," and the costs that errors in the action may pose are "significant."

EPA is denying the request to undertake an "on the record" formal rulemaking. EPA is under no obligation to follow the extraordinarily rarely used formal rulemaking provisions of the APA. First, CAA section 307(d) of the CAA clearly states that the rulemaking provisions of CAA section 307(d), *not* APA sections 553 through 557, apply to certain specified actions, such as this

⁵ Peterson, T.C., and M.O. Baringer (Eds.) (2009) State of the Climate in 2008. *Bull. Amer. Meteor. Soc.*, 90, S1–S196.

one. EPA has satisfied all the requirements of CAA section 307(d). Indeed, the commenter itself “is not asserting that the Clean Air Act expressly requires” the additional procedures it requests. Moreover, the commenter does not discuss how the suggested formal proceeding would fit into the informal rulemaking requirements of CAA section 307(d) that do apply.

Formal rulemaking is very rarely used by Federal agencies. The formal rulemaking provisions of the APA are only triggered when the statute explicitly calls for proceedings “on the record after opportunity for an agency hearing.” *United States v. Florida East Coast Ry. Co.*, 410 U.S. 224, 241 (1973). The mere mention of the word “hearing” does not trigger the formal rulemaking provisions of the APA. *Id.* The CAA does not include the statutory phrase required to trigger the formal rulemaking provisions of the APA (and as noted above the APA does not apply in the first place). Congress specified that certain rulemakings under the CAA follow the rulemaking procedures outlined in CAA section 307(d) rather than the APA “formal rulemaking” commenter suggests.

Despite the inapplicability of the formal rulemaking provisions to this action, commenters suggest that to refuse to voluntarily undertake rulemaking provisions not preferred by Congress would make EPA’s rulemaking action an “abuse of discretion.” EPA disagrees with this claim, and cases cited by the commenter do not indicate otherwise. To support the idea that an agency decision to engage in informal rulemaking could be an abuse of discretion, commenter cites *Ford Motor Co. v. FTC*, 673 F.2d 1008 (9th Cir. 1981). In *Ford Motor Co.*, the court ruled that the FTC’s decision regarding an automobile dealership should have been resolved through a rulemaking rather than an individualized adjudication. *Id.* at 1010. In that instance, the court favored “rulemaking” over adjudication—not “formal rulemaking” over the far more common “informal rulemaking.” The case stands only for the non-controversial proposition that sometimes agency use of *adjudications* may rise to an abuse of discretion where a *rulemaking* would be more appropriate—whether formal or informal. The Commenter does not cite a single judicial opinion stating that an agency abused its discretion by following the time-tested and Congressionally-favored informal rulemaking provisions of the CAA or the APA instead of the rarely used formal APA rulemaking provisions.

The commenter also alludes to the possibility that the choice of informal rulemaking may be “arbitrary and capricious.” EPA disagrees that the choice to follow the frequently used, and CAA required, informal rulemaking procedures is arbitrary and capricious. The commenter cites *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519 (1978) for the proposition that “extremely compelling circumstances” could lead to a court overturning agency action for declining to follow extraneous procedures. As the commenter notes, in *Vermont Yankee* the Supreme Court overturned a lower court decision for imposing additional requirements not required by applicable statutes. Even if the dicta in *Vermont Yankee* could be applied contrary to the holding of the case in the way the commenter suggests, EPA’s decision to follow frequently used informal rulemaking procedures for this action is highly reasonable.

As for the ACUS factors the commenter cites in support of its request, as the commenter notes, the ACUS factors are mere recommendations. While EPA certainly respects the views of ACUS, the recommendations are not binding on the Agency. In addition, EPA has engaged in a thorough, traditional rulemaking process that ensures that any concerns expressed by the commenter have been addressed. EPA has fully satisfied all applicable law in their consideration of this rulemaking.

Finally, as explained in Section III of these Findings and the Response to Comments document, EPA’s approach to evaluating the evidence before it was entirely reasonable, and did not require a formal hearing. EPA relied primarily on robust synthesis reports that have undergone peer review and comment. The Agency also carefully considered the comments received on the Proposed Findings and TSD, including review of attached studies and documents. The public has had ample opportunity to provide its views on the science, and the record supporting these final findings indicates that EPA carefully considered and responded to significant public comments. To the extent the commenter’s concern is that a formal proceeding will help ensure the *right* action in response to climate change is taken, that is not an issue for these Findings. As discussed in Section III of these Findings, this science-based judgment is not the forum for considering the potential mitigation options or their impact.

II. Legal Framework for This Action

As discussed in the Proposed Findings, two statutory provisions of the

CAA govern the Administrator’s Findings. Section 202(a) of the CAA sets forth a two-part test for regulatory action under that provision: Endangerment and cause or contribute. Section 302 of the CAA contains definitions of the terms “air pollutant” and “effects on welfare”. Below is a brief discussion of these statutory provisions and how they govern the Administrator’s decision, as well as a summary of significant legal comments and EPA’s responses to them.

A. Section 202(a) of the CAA— Endangerment and Cause or Contribute

1. The Statutory Framework

Section 202(a)(1) of the CAA states that:

The Administrator shall by regulation prescribe (and from time to time revise) standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in [her] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.

Based on the text of CAA section 202(a) and its legislative history, the Administrator interprets the two-part test as follows. Further discussion of this two-part test can be found in Section II of the preamble for the Proposed Findings. First, the Administrator is required to protect public health and welfare, but she is not asked to wait until harm has occurred. EPA must be ready to take regulatory action to prevent harm before it occurs. Section 202(a)(1) requires the Administrator to “anticipate” “danger” to public health or welfare. The Administrator is thus to consider both current and future risks. Second, the Administrator is to exercise judgment by weighing risks, assessing potential harms, and making reasonable projections of future trends and possibilities. It follows that when exercising her judgment the Administrator balances the likelihood and severity of effects. This balance involves a sliding scale; on one end the severity of the effects may be of great concern, but the likelihood low, while on the other end the severity may be less, but the likelihood high. Under either scenario, the Administrator is permitted to find endangerment. If the harm would be catastrophic, the Administrator is permitted to find endangerment even if the likelihood is small.

Because scientific knowledge is constantly evolving, the Administrator may be called upon to make decisions while recognizing the uncertainties and

limitations of the data or information available, as risks to public health or welfare may involve the frontiers of scientific or medical knowledge. At the same time, the Administrator must exercise reasoned decision making, and avoid speculative inquiries. Third, as discussed further below, the Administrator is to consider the cumulative impact of sources of a pollutant in assessing the risks from air pollution, and is not to look only at the risks attributable to a single source or class of sources. Fourth, the Administrator is to consider the risks to all parts of our population, including those who are at greater risk for reasons such as increased susceptibility to adverse health effects. If vulnerable subpopulations are especially at risk, the Administrator is entitled to take that point into account in deciding the question of endangerment. Here too, both likelihood and severity of adverse effects are relevant, including catastrophic scenarios and their probabilities as well as the less severe effects. As explained below, vulnerable subpopulations face serious health risks as a result of climate change.

In addition, by instructing the Administrator to consider whether emissions of an air pollutant cause or contribute to air pollution, the statute is clear that she need not find that emissions from any one sector or group of sources are the sole or even the major part of an air pollution problem. The use of the term “contribute” clearly indicates a lower threshold than the sole or major cause. Moreover, the statutory language in CAA section 202(a) does not contain a modifier on its use of the term contribute. Unlike other CAA provisions, it does not require “significant” contribution. See, e.g., CAA sections 111(b); 213(a)(2), (4). To be sure, any finding of a “contribution” requires some threshold to be met; a truly trivial or de minimis “contribution” might not count as such. The Administrator therefore has ample discretion in exercising her reasonable judgment in determining whether, under the circumstances presented, the cause or contribute criterion has been met. Congress made it clear that the Administrator is to exercise her judgment in determining contribution, and authorized regulatory controls to address air pollution even if the air pollution problem results from a wide variety of sources. While the endangerment test looks at the entire air pollution problem and the risks it poses, the cause or contribute test is designed to authorize EPA to identify and then address what may well be many

different sectors or groups of sources that are each part of—and thus contributing to—the problem.

This framework recognizes that regulatory agencies such as EPA must be able to deal with the reality that “[m]an’s ability to alter his environment has developed far more rapidly than his ability to foresee with certainty the effects of his alterations.” See *Ethyl Corp. v. EPA*, 541 F.2d 1, 6 (DC Cir.), cert. denied 426 U.S. 941 (1976). Both “the Clean Air Act ‘and common sense * * * demand regulatory action to prevent harm, even if the regulator is less than certain that harm is otherwise inevitable.’” See *Massachusetts v. EPA*, 549 U.S. at 506, n.7 (citing *Ethyl Corp.*).

The Administrator recognizes that the context for this action is unique. There is a very large and comprehensive base of scientific information that has been developed over many years through a global consensus process involving numerous scientists from many countries and representing many disciplines. She also recognizes that there are varying degrees of uncertainty across many of these scientific issues. It is in this context that she is exercising her judgment and applying the statutory framework. As discussed in the Proposed Findings, this interpretation is based on and supported by the language in CAA section 202(a), its legislative history and case law.

2. Summary of Response to Key Legal Comments on the Interpretation of the CAA Section 202(a) Endangerment and Cause or Contribute Test

EPA received numerous comments regarding the interpretation of CAA section 202(a) set forth in the Proposed Findings. Below is a brief discussion of some of the key adverse legal comments and EPA’s responses. Other key legal comments and EPA’s responses are provided in later sections discussing the Administrator’s findings.

Additional and more detailed summaries and responses can be found in the Response to Comments document. As noted in the Response to Comments document, EPA also received comments supporting its legal interpretations.

a. The Administrator Properly Interpreted the Precautionary and Preventive Nature of the Statutory Language

Various commenters argue either that the endangerment test under CAA section 202(a) is not precautionary and preventive in nature, or that EPA’s interpretation and application is so extreme that it is contrary to what Congress intended in 1977, and

effectively guarantees an affirmative endangerment finding. Commenters also argue that the endangerment test improperly shifts the burdens to the opponents of an endangerment finding and is tantamount to assuming the air pollution is harmful unless it is shown to be safe.

EPA rejects the argument that the endangerment test in CAA section 202(a) is not precautionary or preventive in nature. As discussed in more detail in the proposal, Congress relied heavily on the en banc decision in *Ethyl* when it revised section 202(a) and other CAA provisions to adopt the current language on endangerment and contribution. 74 FR 18886, 18891–2. The *Ethyl* court could not have been clearer on the precautionary nature of a criteria based on endangerment. The court rejected the argument that EPA had to find actual harm was occurring before it could make the required endangerment finding. The court stated that:

The Precautionary Nature of “Will Endanger.” Simply as a matter of plain meaning, we have difficulty crediting petitioners’ reading of the “will endanger” standard. The meaning of “endanger” is not disputed. Case law and dictionary definition agree that endanger means something less than actual harm. When one is endangered, harm is *threatened*; no actual injury need ever occur. Thus, for example, a town may be “endangered” by a threatening plague or hurricane and yet emerge from the danger completely unscathed. A statute allowing for regulation in the face of danger is, necessarily, a precautionary statute. Regulatory action may be taken before the threatened harm occurs; indeed, the very existence of such precautionary legislation would seem to *demand* that regulatory action precede, and, optimally, prevent, the perceived threat. As should be apparent, the “will endanger” language of Section 211(c)(1)(A) makes it such a precautionary statute. *Ethyl* at 13 (footnotes omitted).

Similarly, the court stated that “[i]n sum, based on the plain meaning of the statute, the juxtaposition of CAA section 211 with CAA sections 108 and 202, and the *Reserve Mining* precedent, we conclude that the “will endanger” standard is precautionary in nature and does not require proof of actual harm before regulation is appropriate.” *Ethyl* at 17. It is this authority to act before harm has occurred that makes it a preventive, precautionary provision.

It is important to note that this statement was in the context of rejecting an argument that EPA had to prove actual harm before it could adopt fuel control regulations under then CAA section 211(c)(1). The court likewise rejected the argument that EPA had to show that such harm was “probable.”

The court made it clear that determining endangerment entails judgments involving both the risk or likelihood of harm and the severity of the harm if it were to occur. Nowhere did the court indicate that the burden was on the opponents of an endangerment finding to show that there was no endangerment. The opinion focuses on describing the burden the statute places on EPA, rejecting *Ethyl's* arguments of a burden to show actual or probable harm.

Congress intentionally adopted a precautionary and preventive approach. It stated that the purpose of the 1977 amendments was to “emphasize the preventive or precautionary nature of the act, *i.e.*, to assure that regulatory action can effectively prevent harm before it occurs; to emphasize the predominate value of protection to public health.”⁶ Congress also stated that it authorized the Administrator to weigh risks and make projections of future trends, a “middle road between those who would impose a nearly impossible standard of proof on the Administrator before he may move to protect public health and those who would shift the burden of proof for all pollutants to make the pollutant source prove the safety of its emissions as a condition of operation.” Leg. His. at 2516.

Thus, EPA rejects commenters’ arguments. Congress intended this provision to be preventive and precautionary in nature, however it did not shift the burden of proof to opponents of an endangerment finding to show safety or no endangerment. Moreover, as is demonstrated in the following, EPA has not shifted the burden of proof in the final endangerment finding, but rather is weighing the likelihood and severity of harms to arrive at the final finding. EPA has not applied an exaggerated or dramatically expanded precautionary principle, and instead has exercised judgment by weighing and balancing the factors that are relevant under this provision.

b. The Administrator Does Not Need To Find That the Control Measures Following an Endangerment Finding Would Prevent at Least a Substantial Part of the Danger in Order To Find Endangerment

Several commenters argue that it is unlawful for EPA to make an affirmative endangerment finding unless EPA finds

that the regulatory control measures contemplated to follow such a finding would prevent at least a substantial part of the danger from the global climate change at which the regulation is aimed. This hurdle is also described by commenters as the regulation “achieving the statutory objective of preventing damage”, or “fruitfully attacking” the environmental and public health danger at hand by meaningfully and substantially reducing it. Commenters point to *Ethyl Corp. v. EPA*, 541 F.2d 1 (DC Cir. 1976) (en banc) as support for this view, as well as portions of the legislative history of this provision.

Commenters contend that EPA has failed to show that this required degree of meaningful reduction of endangerment would be achieved through regulation of new motor vehicles based on an endangerment finding. In making any such showing, commenters argue that EPA would need to account for the following: (1) The fact that any regulation would be limited to new motor vehicles, if not the subset of new motor vehicles discussed in the President’s May 2009 announcement, (2) any increase in emissions from purchasers delaying purchases of new vehicles subject to any greenhouse gas emissions standards, or increasing the miles traveled of new vehicles with greater fuel economy, (3) the fact that only a limited portion of the new motor vehicle emissions of greenhouse gases would be controlled, (4) the fact that CAFE standards would effectively achieve the same reductions, and (5) the fact that any vehicle standards would not themselves reduce global temperatures. Some commenters refer to EPA’s proposal for greenhouse gas emissions standards for new motor vehicles as support for these arguments, claiming the proposed new motor vehicle emission standards are largely duplicative of the standards proposed by the National Highway Traffic Safety Administration (NHTSA), and the estimates of the impacts of the proposed standards confirm that EPA’s proposed standards cannot “fruitfully attack” global climate change (74 FR 49454, September 28, 2009).

Commenters attempt to read into the statute a requirement that is not there. EPA interprets the endangerment provision of CAA section 202(a) as not requiring any such finding or showing as described by commenters. The text of CAA section 202(a) does not support such an interpretation. The endangerment provision calls for EPA, in its judgment, to determine whether air pollution is reasonably anticipated to endanger public health or welfare, and

whether emissions from certain sources cause or contribute to such air pollution. If EPA makes an affirmative finding, then it shall set emissions standards applicable to emissions of such air pollutants from new motor vehicles. There is no reference in the text of the endangerment or cause or contribute provision to anything concerning the degree of reductions that would be achieved by the emissions standards that would follow such a finding. The Administrator’s judgment is directed at the issues of endangerment and cause or contribute, not at how effective the resulting emissions control standards will be.

As in the several other similar provisions adopted in the 1977 amendments, in CAA section 202(a) Congress explicitly separated two different decisions to be made, providing different criteria for them. The first decision involves the air pollution and the endangerment criteria, and the contribution to the air pollution by the sources. The second decision involves how to regulate the sources to control the emissions if an affirmative endangerment and contribution finding are made. In all of the various provisions, there is broad similarity in the phrasing of the endangerment and contribution decision. However, for the decision on how to regulate, there are a wide variety of different approaches adopted by Congress. In some case, EPA has discretion whether to issue standards or not, while in other cases, as in CAA section 202(a), EPA is required to issue standards. In some cases, the regulatory criteria are general, as in CAA section 202(a); in others, they provide significantly more direction as to how standards are to be set, as in CAA section 213(a)(4).

As the Supreme Court made clear in *Massachusetts v. EPA*, EPA’s judgment in making the endangerment and contribution findings is constrained by the statute, and EPA is to decide these issues based solely on the scientific and other evidence relevant to that decision. EPA may not “rest[] on reasoning divorced from the statutory text,” and instead EPA’s exercise of judgment must relate to whether an air pollutant causes or contributes to air pollution that endangers. *Massachusetts v. EPA*, 549 U.S. at 532. As the Supreme Court noted, EPA must “exercise discretion within defined statutory limits.” *Id.* at 533. EPA’s belief one way or the other regarding whether regulation of greenhouse gases from new motor vehicles would be “effective” is irrelevant in making the endangerment and contribution decisions before EPA. *Id.* Instead “[t]he statutory question is

⁶ The Supreme Court recognized that the current language in section 202(a), adopted in 1977, is “more protective” than the 1970 version that was similar to the section 211 language before the DC Circuit in *Ethyl. Massachusetts v. EPA*, 549 U.S. at 506, fn 7.

whether sufficient information exists to make an endangerment finding” Id. at 534.

The effectiveness of a potential future control strategy is not relevant to deciding whether air pollution levels in the atmosphere endanger. It is also not relevant to deciding whether emissions of greenhouse gases from new motor vehicles contribute to such air pollution. Commenters argue that Congress implicitly imposed a third requirement, that the future control strategy have a certain degree of effectiveness in reducing the endangerment before EPA could make the affirmative findings that would authorize such regulation. There is no statutory text that supports such an interpretation, and the Supreme Court makes it clear that EPA has no discretion to read this kind of additional factor into CAA section 202(a)’s endangerment and contribution criteria. In fact, the Supreme Court rejected similar arguments that EPA had the discretion to consider various other factors besides endangerment and contribution in deciding whether to deny a petition. *Massachusetts v. EPA*, 549 U.S. at 532–35.

Commenters point to language from the *Ethyl* case to support their position, noting that the DC Circuit referred to the emissions control regulation adopted by EPA under CAA section 211(c) as one that would “fruitfully attack” the environmental and public health danger by meaningfully and substantially reducing the danger. It is important to understand the context for this discussion in *Ethyl*. The petitioner *Ethyl Corp.* argued that EPA had to show that the health threat from the emissions of lead from the fuel additive being regulated had to be considered in isolation, and the threat “in and of itself” from the additive had to meet the test of endangerment in CAA section 211(c). EPA had rejected this approach, and had interpreted CAA section 211(c)(1) as calling for EPA to look at the cumulative impact of lead, and to consider the impact of lead from emissions related to use of the fuel additive in the context all other human exposure to lead. The court rejected *Ethyl*’s approach and supported EPA’s interpretation. The DC Circuit noted that Congress was fully aware that the burden of lead on the body was caused by multiple sources and that it would be of no value to try and determine the effect on human health from the lead automobile emissions by themselves. The court specifically noted that “the incremental effect of lead emissions on the total body lead burden is of no practical value in determining whether

health is endangered,” but recognized that this incremental effect is of value “in deciding whether the lead exposure problem can fruitfully be attacked through control of lead additives.” *Ethyl*, 541 F.2d at 31 fn 62. The court made clear that the factor that was critically important to determining the effectiveness of the resulting control strategy—the incremental effect of automobile lead emissions on total body burden—was irrelevant and of no value in determining whether the endangerment criteria was met. Thus it is clear that the court in *Ethyl* did not interpret then CAA section 211(c)(1)(A) as requiring EPA to make a showing of the effectiveness of the resulting emissions control strategy, and instead found just the opposite, that the factors that would determine effectiveness are irrelevant to determining endangerment.

Commenters also cite to the legislative history, noting that Congress referred to the “preventive or precautionary nature of the Act, i.e., to assure that regulatory action can effectively prevent harm before it occurs.” Leg. Hist. at 2516. However, this statement by Congress is presented as an answer to the question on page 2515, “Should the Administrator act to prevent harm before it occurs or should he be authorized to regulate an air pollutant only if he finds actual harm has already occurred.” Leg. Hist. at 2515. In this context, the discussion on page 2516 clearly indicates that there is no opportunity for prevention or precaution if the test is one of actual harm already occurring. This discussion does not say or imply that even if the harm has not occurred, you can not act unless you also show that your action will effectively address it. This discussion concerns the endangerment test, not the criteria for standard setting. The criteria for standard setting address how the agency should act to address the harm, and as the *Ethyl* case notes, the factors relevant to how to “fruitfully attack” the harm are irrelevant to determining whether the harm is one that endangers the public health or welfare.

As with current CAA section 202(a), there is no basis to conflate these two separate decisions and to read into the endangerment criteria an obligation that EPA show that the resulting emissions control strategy or strategies will have some significant degree of harm reduction or effectiveness in addressing the endangerment. The conflating of the two decisions is not supported in the text of this provision, by the Supreme Court in *Massachusetts v. EPA*, by the DC Circuit in *Ethyl*, or by Congress in the legislative history of this provision.

It would be an unworkable interpretation, calling for EPA to project out the result of perhaps not one, but even several, future rulemakings stretching over perhaps a decade or decades. Especially in the context of global climate change, the effectiveness of a control strategy for new motor vehicles would have to be viewed in the context of a number of future motor vehicle regulations, as well as in the larger context of the CAA and perhaps even global context. That would be an unworkable and speculative requirement to impose on EPA as a precondition to answering the public health and welfare issues before it, as they are separate and apart from the issues involved with developing, implementing and evaluating the effectiveness of emissions control strategies.

c. The Administrator Does Not Need To Find There Is Significant Risk of Harm

Commenters argue that Congress established a minimum requirement that there be a “significant risk of harm” to find endangerment. They contend that this requirement stemmed from the *Ethyl* case, and that Congress adopted this view. According to the commenters, the risk is the function of two variables: the nature of the hazard at issue and the likelihood of its occurrence. Commenters argue that Congress imposed a requirement that this balance demonstrate a “significant risk of harm” to strike a balance between the precautionary nature of the CAA and the burdensome economic and societal consequences of regulation.

There are two basic problems with the commenters’ arguments. First, commenters equate “significant risk of harm” as the overall test for endangerment, however the *Ethyl* case and the legislative history treat the risk of harm as only one of the two components that are to be considered in determining endangerment.—, The two components are the likelihood or risk of a harm occurring, and the severity of harm if it were to occur. Second, commenters equate it to a minimum statutory requirement. However, while the court in the *Ethyl* case made it clear that the facts in that case met the then applicable endangerment criteria, it also clearly said it was not determining what other facts or circumstances might amount to endangerment, including cases where the likelihood of a harm occurring was less than a significant risk of the harm.

In the EPA rulemaking that led to the *Ethyl* case, EPA stated that the requirement to reduce lead in gasoline “is based on the finding that lead

particle emissions from motor vehicles present a significant risk of harm to the health of urban populations, particularly to the health of city children” (38 FR 33734, December 6, 1973). The court in *Ethyl* supported EPA’s determination, and addressed a variety of issues. First, it determined that the “will endanger” criteria of then CAA section 211(c) was intended to be precautionary in nature. It rejected arguments that EPA had to show proof of actual harm, or probable harm. *Ethyl*, 541 F.2d at 13–20. It was in this context, evaluating petitioner’s arguments on whether the likelihood of a harm occurring had to rise to the level of actual or probable harm, that the court approved of EPA’s view that a significant risk of harm could satisfy the statutory criteria. The precautionary nature of the provision meant that EPA did not need to show that either harm was actually occurring or was probable.

Instead, the court made it clear that the concept of endangerment is “composed of reciprocal elements of risk and harm,” *Ethyl* at 18. This means “the public health may properly be found endangered both by a lesser risk of a greater harm and by a greater risk of lesser harm. Danger depends upon the relation between the risk and harm presented by each case, and cannot legitimately be pegged to ‘probable’ harm, regardless of whether that harm be great or small.” The *Ethyl* court pointed to the decision by the 8th Circuit in *Reserve Mining Co. v. EPA*, 514 F.2d 492 (8th Cir. 1975), which interpreted similar language under the Federal Water Pollution Control Act, where the 8th Circuit upheld an endangerment finding in a case involving “reasonable medical concern,” or a “potential” showing of harm. This was further evidence that a minimum “probable” likelihood of harm was not required.

The *Ethyl* court made it clear that there was no specific magnitude of risk of harm occurring that was required. “Reserve Mining convincingly demonstrates that the magnitude of risk sufficient to justify regulation is inversely proportional to the harm to be avoided.” *Ethyl* at 19. This means there is no minimum requirement that the magnitude of risk be “significant” or another specific level of likelihood of occurrence. You need to evaluate the risk of harm in the context of the severity of the harm if it were to occur. In the case before it, the *Ethyl* court noted that “the harm caused by lead poisoning is severe.” Even with harm as severe as lead poisoning, EPA did not rely on “potential” risk or a “reasonable medical concern.” Instead, EPA found

that there was a significant risk of this harm to health. This finding of a significant risk was less than the level of “probable” harm called for by the petitioner *Ethyl* Corporation but was “considerably more certain than the risk that justified regulation in Reserve Mining of a comparably ‘fright-laden’ harm.” *Ethyl* at 19–20. The *Ethyl* court concluded that this combination of risk (likelihood of harm) and severity of harm was sufficient under CAA section 211(c). “Thus we conclude that however far the parameters of risk and harm inherent in the ‘will endanger’ standard might reach in an appropriate case, they certainly present a ‘danger’ that can be regulated when the harm to be avoided is widespread lead poisoning and the risk of that occurrence is ‘significant’.” *Ethyl* at 20.

Thus, the court made it clear that the endangerment criteria was intended to be precautionary in nature, that the risk of harm was one of the elements to consider in determining endangerment, and that the risk of harm needed to be considered in the context of the severity of the potential harm. It also concluded that a significant risk of harm coupled with an appropriate severity of the potential harm would satisfy the statutory criteria, and in the case before it the Administrator was clearly authorized to determine endangerment where there was a significant risk of harm that was coupled with a severe harm such as lead poisoning.

Importantly, the court also made it clear that it was not determining a minimum threshold that always had to be met. Instead, it emphasized that the risk of harm and severity of the potential harm had to be evaluated on a case by case basis. The court specifically said it was not determining “however far the parameters of risk and harm * * * might reach in an appropriate case.” *Ethyl* at 20. Also see *Ethyl* fn 17 at 13. The court recognized that this balancing of risk and harm “must be confined to reasonable limits” and even absolute certainty of a de minimis harm might not justify government action. However, “whether a particular combination of slight risk and great harm, or great risk and slight harm constitutes a danger must depend on the facts of each case.” *Ethyl* at fn 32 at 18.⁷

⁷ Commenters point to *Amer. Farm Bureau Ass’n v. EPA*, 559 F.3d 512, 533 (DC Cir. 2009) as supporting their argument. However, in that case the Court made clear that EPA’s action was not subject to the endangerment criterion in CAA section 108 but instead was subject to CAA section 109’s requirement that the primary NAAQS be requisite to protect the public health with an adequate margin of safety. Under that provision and

In some cases, commenters confuse matters by switching the terminology, and instead refer to effects that “significantly harm” the public health or welfare. As with the reference to “significant risk of harm,” commenters fail to recognize that there are two different aspects that must be considered, risk of harm and severity of harm, and neither of these aspects has a requirement that there be a finding of “significance.” The DC Circuit in *Ethyl* makes clear that it is the combination of these two aspects that must be evaluated for purposes of endangerment, and there is no requirement of “significance” assigned to either of the two aspects that must instead be evaluated in combination. Congress addressed concerns over burdensome economic and societal consequences in the various statutory provisions that provide the criteria for standard setting or other agency action if there is an affirmative endangerment finding. Those statutory provisions, for example, make standard setting discretionary or specify how cost and other factors are to be taken into consideration in setting standards. However, the issues of risk of harm and severity of harm if it were to occur are separate from the issues of the economic impacts of any resulting regulatory provisions (*see below*).

As is clear in the prior summary of the endangerment findings and the more detailed discussion later, the breadth of the sectors of our society that are affected by climate change and the time frames at issue mean there is a very wide range of risks and harms that need to be considered, from evidence of various harms occurring now to evidence of risks of future harms. The Administrator has determined that the body of scientific evidence compellingly supports her endangerment finding.

B. Air Pollutant, Public Health and Welfare

The CAA defines both “air pollutant” and “effects on welfare.” We provide both definitions here again for convenience.

Air pollutant is defined as:

its case law, the Court upheld EPA’s reasoned balancing of the uncertainty regarding the link between non-urban thoracic coarse PM and adverse health effects, the large population groups potentially exposed to these particles, and the nature and degree of the health effects at issue. Citing to EPA’s reasoning at 71 FR 61193 in the final PM rule, the court explained that EPA need not wait for conclusive proof of harm before setting a NAAQS under section 109 for this kind of coarse PM. The Court’s reference to EPA’s belief that there may be a significant risk to public health is not stated as any sort of statutory minimum, but instead refers to the Agency’s reasoning at 71 FR 61193, which displays a reasoned balancing of possibility of harm and severity of harm if it were to occur.

“Any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term ‘air pollutant’ is used.” CAA section 302(g). As the Supreme Court held, greenhouse gases fit well within this capacious definition. *See Massachusetts v. EPA*, 549 U.S. at 532. They are “without a doubt” physical chemical substances emitted into the ambient air. *Id.* at 529.

“Regarding ‘effects on welfare’, the CAA states that [a]ll language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants.” CAA section 302(h).

As noted in the Proposed Findings, this definition is quite broad. Importantly, it is not an exclusive list due to the use of the term “includes, but is not limited to, * * *.” Effects other than those listed here may also be considered effects on welfare. Moreover, the terms contained within the definition are themselves expansive.

Although the CAA defines “effects on welfare” as discussed above, there are no definitions of “public health” or “public welfare” in the CAA. The Supreme Court has discussed the concept of public health in the context of whether costs of implementation can be considered when setting the health based primary National Ambient Air Quality Standards. *Whitman v. American Trucking Ass’n*, 531 U.S. 457 (2001). In *Whitman*, the Court imbued the term with its most natural meaning: “the health of the public. *Id.* at 466. In the past, when considering public health, EPA has looked at morbidity, such as impairment of lung function, aggravation of respiratory and cardiovascular disease, and other acute and chronic health effects, as well as mortality. *See, e.g., Final National Ambient Air Quality Standard for Ozone*, (73 FR 16436, 2007).

EPA received numerous comments regarding its proposed interpretations of

air pollutant and public health and welfare. Summaries of key comments and EPA’s responses are discussed in Sections IV and V of these Findings. Additional and more detailed summaries and responses can be found in the Response to Comments document. As noted in the Response to Comments document, EPA also received comments supporting its legal interpretations.

III. EPA’s Approach for Evaluating the Evidence Before It

This section discusses EPA’s approach to evaluating the evidence before it, including the approach taken to the scientific evidence, the legal framework for this decision making, and several issues critical to determining the scope of the evaluation performed.

A. The Science on Which the Decisions Are Based

In 2007, EPA initiated its assessment of the science and other technical information to use in addressing the endangerment and cause or contribute issues before it under CAA section 202(a). This scientific and technical information was developed in the form of a TSD in 2007. An earlier draft of this document was released as part of the ANPR published July 30, 2008 (73 FR 44353). That earlier draft of the TSD relied heavily on the IPCC Fourth Assessment Report of 2007, key NRC reports, and a limited number of then-available synthesis and assessment products of the U.S. Climate Change Science Program (CCSP; now encompassed by USGCRP). EPA received a number of comments specifically focused on the TSD during the 120-day public comment period for the ANPR.

EPA revised and updated the TSD in preparing the Proposed Findings on endangerment and cause or contribute. Many of the comments received on the ANPR were reflected in the draft TSD released in April 2009 that served as the underlying scientific and technical basis for the Administrator’s Proposed Findings, published April 24, 2009 (74 FR 18886). The draft TSD released in April 2009 also reflected the findings of 11 new synthesis and assessment products under the U.S. CCSP that had been published since July 2008.

The TSD that summarizes scientific findings from the major assessments of the USGCRP, the IPCC, and the NRC accompanies these Findings. The TSD is available at www.epa.gov/climatechange/endangerment.html and in the docket for this action. It also includes the most recent comprehensive assessment of the USGCRP, *Global*

Climate Change Impacts in the United States,⁸ published in June 2009. In addition, the TSD incorporates up-to-date observational data for a number of key climate variables from the NOAA, and the most up-to-date emissions data from EPA’s annual *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, published in April, 2009.⁹ And finally, as discussed in Section I.B of these Findings, EPA received a large number of public comments on the Administrator’s Proposed Findings, many of which addressed science issues either generally or specifically as reflected in the draft TSD released with the April 2009 proposal. A number of edits and updates were made to the draft TSD as a result of these comments.¹⁰

EPA is giving careful consideration to all of the scientific and technical information in the record, as discussed below. However, the Administrator is relying on the major assessments of the USGCRP, IPCC, and NRC as the primary scientific and technical basis of her endangerment decision for a number of reasons.

First, these assessments address the scientific issues that the Administrator must examine for the endangerment analysis. When viewed in total, these assessments address the issue of greenhouse gas endangerment by providing data and information on: (1) The amount of greenhouse gases being emitted by human activities; (2) how greenhouse gases have been and continue to accumulate in the atmosphere as a result of human activities; (3) changes to the Earth’s energy balance as a result of the buildup of atmospheric greenhouse gases; (4) observed temperature and other climatic changes at the global and regional scales; (5) observed changes in other climate-sensitive sectors and systems of the human and natural environment; (6) the extent to which observed climate change and other changes in climate-sensitive systems can be attributed to the human-induced buildup of atmospheric greenhouse gases; (7) future projected climate change under a range of different scenarios of changing greenhouse gas emission rates; and (8) the projected risks and impacts to

⁸ Karl, T., J. Melillo, and T. Peterson (Eds.) (2009) *Global Climate Change Impacts in the United States*. Cambridge University Press, Cambridge, United Kingdom.

⁹ U.S. EPA (2009) *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007*. EPA-430-R-09-004, Washington, DC.

¹⁰ EPA has placed within the docket a separate memo “Summary of Major Changes to the Technical Support Document” identifying where within the TSD such changes were made relative to the draft TSD released in April 2009.

human health, society and the environment.

Second, as indicated above, these assessments are recent and represent the current state of knowledge on the key elements for the endangerment analysis. It is worth noting that the June 2009 assessment of the USGCRP incorporates a number of key findings from the 2007 IPCC Fourth Assessment Report; such findings include the attribution of observed climate change to human emissions of greenhouse gases, and the future projected scenarios of climate change for the global and regional scales. This demonstrates that much of the underlying science that EPA has been utilizing since 2007 has not only been in the public domain for some time, but also has remained relevant and robust.

Third, these assessments are comprehensive in their coverage of the greenhouse gas and climate change problem, and address the different stages of the emissions-to-potential-harm chain necessary for the endangerment analysis. In so doing, they evaluate the findings of numerous individual peer-reviewed studies in order to draw more general and overarching conclusions about the state of science. The USGCRP, IPCC, and NRC assessments synthesize literally thousands of individual studies and convey the consensus conclusions on what the body of scientific literature tells us.

Fourth, these assessment reports undergo a rigorous and exacting standard of peer review by the expert community, as well as rigorous levels of U.S. government review and acceptance. Individual studies that appear in scientific journals, even if peer reviewed, do not go through as many review stages, nor are they reviewed and commented on by as many scientists. The review processes of the IPCC, USGCRP, and NRC (explained in fuller detail in the TSD and the Response to Comments document, Volume 1) provide EPA with strong assurance that this material has been well vetted by both the climate change research community and by the U.S. government. These assessments therefore essentially represent the U.S. government's view of the state of knowledge on greenhouse gases and climate change. For example, with regard to government acceptance and approval of IPCC assessment reports, the USGCRP Web site states that: "When governments accept the IPCC reports and approve their Summary for Policymakers, they acknowledge the legitimacy of their

scientific content."¹¹ It is the Administrator's view that such review and acceptance by the U.S. Government lends further support for placing primary weight on these major assessments.

It is EPA's view that the scientific assessments of the IPCC, USGCRP, and the NRC represent the best reference materials for determining the general state of knowledge on the scientific and technical issues before the agency in making an endangerment decision. No other source of information provides such a comprehensive and in-depth analysis across such a large body of scientific studies, adheres to such a high and exacting standard of peer review, and synthesizes the resulting consensus view of a large body of scientific experts across the world. For these reasons, the Administrator is placing primary and significant weight on these assessment reports in making her decision on endangerment.

A number of commenters called upon EPA to perform a new and independent assessment of all of the underlying climate change science, separate and apart from USGCRP, IPCC, and NRC. In effect, commenters suggest that EPA is either required to or should ignore the attributes discussed above concerning these assessment reports, and should instead perform its own assessment of all of the underlying studies and information.

In addition to the significant reasons discussed above for relying on and placing primary weight on these assessment reports, EPA has been a very active part of the U.S. government climate change research enterprise, and has taken an active part in the review, writing, and approval of these assessments. EPA was the lead agency for three significant reports under the USGCRP¹², and recently completed an

assessment addressing the climate change impacts on U.S. air quality—a report on which the TSD heavily relies for that particular issue. EPA was also involved in review of the IPCC Fourth Assessment Report, and in particular took part in the approval of the summary for policymakers for the Working Group II Volume, *Impacts, Adaptation and Vulnerability*.¹³ The USGCRP, IPCC, and NRC assessments have been reviewed and formally accepted by, commissioned by, or in some cases authored by, U.S. government agencies and individual government scientists. These reports already reflect significant input from EPA's scientists and the scientists of many other government agencies.

EPA has no reason to believe that the assessment reports do not represent the best source material to determine the state of science and the consensus view of the world's scientific experts on the issues central to making an endangerment decision with respect to greenhouse gases. EPA also has no reason to believe that putting this significant body of work aside and attempting to develop a new and separate assessment would provide any better basis for making the endangerment decision, especially because any such new assessment by EPA would still have to give proper weight to these same consensus assessment reports.

In summary, EPA concludes that its reliance on existing and recent synthesis and assessment reports is entirely reasonable and allows EPA to rely on the best available science.¹⁴ EPA also recognizes that scientific research is very active in many areas addressed in the TSD (e.g., aerosol effects on climate, climate feedbacks such as water vapor, and internal and external climate forcing mechanisms), as well as for some emerging issues (e.g., ocean acidification and climate change effects on water quality). EPA recognizes the potential importance of new scientific research, and the value of an ongoing process to take more recent science into account. EPA reviewed new literature in

¹¹ <http://www.globalchange.gov/publications/reports/ipcc-reports>.

¹² CCSP (2009) *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. [James G. Titus (Coordinating Lead Author), K. Eric Anderson, Donald R. Cahoon, Dean B. Gesch, Stephen K. Gill, Benjamin T. Gutierrez, E. Robert Thieler, and S. Jeffery Williams (Lead Authors)], U.S. Environmental Protection Agency, Washington DC, USA, 320 pp. CCSP (2008) *Preliminary review of adaptation options for climate-sensitive ecosystems and resources*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. [Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (Authors)], U.S. Environmental Protection Agency, Washington, DC, USA, 873 pp. CCSP (2008) *Analyses of the effects of global change on human health and welfare and human systems*. A Report by the U.S. Climate Change Science Program and the Subcommittee on

Global Change Research. [Gamble, J.L. (ed.), K.L. Ebi, F.G. Sussman, T.J. Wilbanks, (Authors)]. U.S. Environmental Protection Agency, Washington, DC, USA.

¹³ IPCC (2007) *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

¹⁴ It maintains the highest level of adherence to Agency and OMB guidelines for data and scientific integrity and transparency. This is discussed in greater detail in EPA's Response to Comments document.

preparation of this TSD to evaluate its consistency with recent scientific assessments. We also considered public comments received and studies incorporated by reference. In a number of cases, the TSD was updated based on such information to add context for assessment literature findings, which includes supporting information and/or qualifying statements. In other cases, material that was not incorporated into the TSD is discussed within the Response to Comments document.

EPA reviewed these individual studies that were not considered or reflected in these major assessments to evaluate how they inform our understanding of how greenhouse gas emissions affect climate change, and how climate change may affect public health and welfare. Given the very large body of studies reviewed and assessed in developing the assessment reports, and the rigor and breadth of that review and assessment, EPA placed limited weight on the much smaller number of individual studies that were not considered or reflected in the major assessments. EPA reviewed them largely to see if they would lead EPA to change or place less weight on the judgments reflected in the assessment report. While EPA recognizes that some studies are more useful or informative than others, and gave each study it reviewed the weight it was due, the overall conclusion EPA drew from its review of studies submitted by commenters was that the studies did not change the various conclusions or judgments EPA would draw based on the assessment reports.

Many comments focus on the scientific and technical data underlying the Proposed Findings, such as climate change science and greenhouse gas emissions data. These comments cover a range of topics and are summarized and responded to in the Response to Public Comments document. The responses note those cases where a technical or scientific comment resulted in an editorial or substantive change to the TSD. The final TSD reflects all changes made as a result of public comments.

B. The Law on Which the Decisions Are Based

In addition to grounding these determinations on the science, they are also firmly grounded in EPA's legal authority. Section II of these Findings provides an in-depth discussion of the legal framework for the endangerment and cause or contribute decisions under CAA section 202(a), with additional discussion in Section II of the Proposed Finding (74 FR 18886, 18890, April 24,

2009). A variety of important legal issues are also discussed in Sections III, IV, and V of these Findings, as well as in the Response to Comments document, Volume 11. Section IV and V of these Findings explain the Administrator's decisions, and how she exercised her judgment in making the endangerment and contribution determinations, based on the entire scientific record before her and the legal framework structuring her decision making.

C. Adaptation and Mitigation

Following the language of CAA section 202(a), in which the Administrator, in her judgment, must determine if greenhouse gases constitute the air pollution that may be reasonably anticipated to endanger public health or welfare, EPA evaluated, based primarily on the scientific reports discussed above, how greenhouse gases and other climate-relevant substances are affecting the atmosphere and climate, and how these climate changes affect public health and welfare, now and in the future. Consistent with EPA's scientific approach underlying the Administrator's Proposed Findings, EPA did not undertake a separate analysis to evaluate potential societal and policy responses to any threat (*i.e.*, the endangerment) that may exist due to anthropogenic emissions of greenhouse gases. Risk reduction through adaptation and greenhouse gas mitigation measures is of course a strong focal area of scientists and policy makers, including EPA; however, EPA considers adaptation and mitigation to be potential responses to endangerment, and as such has determined that they are outside the scope of the endangerment analysis.

The Administrator's position is not that adaptation will not occur or cannot help protect public health and welfare from certain impacts of climate change, as some commenters intimated. To the contrary, EPA recognizes that some level of autonomous adaptation¹⁵ will occur, and commenters are correct that autonomous adaptation can affect the severity of climate change impacts.

¹⁵ The IPCC definition of adaptation: "Adaptation to climate change takes place through adjustments to reduce vulnerability or enhance resilience in response to observed or expected changes in climate and associated extreme weather events. Adaptation occurs in physical, ecological and human systems. It involves changes in social and environmental processes, perceptions of climate risk, practices and functions to reduce potential damages or to realize new opportunities." The IPCC defines autonomous adaptation as "Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems."

Indeed, there are some cases in the TSD in which some degree of adaptation is accounted for; these cases occur where the literature on which the TSD relies already uses assumptions about autonomous adaptation when projecting the future effects of climate change. Such cases are noted in the TSD. We also view planned adaptation as an important near-term risk-minimizing strategy given that some degree of climate change will continue to occur as a result of past and current emissions of greenhouse gases that remain in the atmosphere for decades to centuries.

However, it is the Administrator's position that projections of adaptation and mitigation in response to risks and impacts associated with climate change are not appropriate for EPA to consider in making a decision on whether the air pollution endangers. The issue before EPA involves evaluating the risks to public health and welfare from the air pollution if we do not take action to address it. Adaptation and mitigation address an important but different issue—how much risk will remain assuming some projection of how people and society will respond to the threat.

Several commenters argue that it is arbitrary not to consider adaptation in determining endangerment. They contend that because endangerment is a forward-looking exercise, the fundamental inquiry concerns the type and extent of harm that is believed likely to occur in the future. Just as the Administrator makes projections of potential harms in the future, these commenters contend that the Administrator needs to consider the literature on adaptation that addresses the likelihood and the severity of potential effects. Commenters also note that since adaption is one of the likely impacts of climate change, it is irrational to exclude it from consideration when the goal is to evaluate the risks and harms in the real world in the future, not the risks and harms in the hypothetical scenario that result if you ignore adaptation.

According to commenters, the Administrator must consider both autonomous adaptation and anticipatory adaptation. They contend that literature on adaptation makes it clear there is a significant potential for adaptation, and that it can reduce the likelihood or severity of various effects, including health effects, and could even avert what might otherwise constitute endangerment. Commenters note that EPA considered the adaptation of species in nature, and it is arbitrary to not also consider adaptation by humans. Moreover, they argue that there is great

certainty that adaptation will occur, and thus EPA is required to address it and make projections. They recommend that EPA look to historic responses to changes in conditions as an analogue in making projections, recognizing that life in the United States is likely to be quite different 50 or 100 years from now, irrespective of climate change.

Commenters argue that adaptation needs to be considered because it is central to the statutory requirements governing the endangerment inquiry. EPA is charged to determine the type and extent of harms that are likely to occur, and they argue that this can not rationally be considered without considering adaptation. Since some degree of adaptation is likely to occur, they continue that such a projection of future actual conditions requires consideration of adaption to evaluate whether the future conditions amount to endangerment from the air pollution.

According to commenters, the issue therefore is focused on human and societal adaptation, which can come in a wide variety of forms, ranging from changes in personal behavioral patterns to expenditures of resources to change infrastructure, such as building and maintaining barriers to protect against sea level rise.

With regard to mitigation, commenters argue that EPA should consider mitigation strategies and their potential to alleviate harm from greenhouse gas emissions. They contend that it is unreasonable for EPA to assume that society will not undertake mitigation.

Section 202(a) of the CAA reflects the basic approach of many CAA sections—the threshold inquiry is whether the endangerment and cause or contribute criteria are satisfied, and only if they are met do the criteria for regulatory action go into effect. This reflects the basic separation of two different decisions—is this a health and welfare problem that should be addressed, and if so what are the appropriate mechanisms to address it? There is a division between identifying the health and welfare problem associated with the air pollution, and identifying the mechanisms used to address or solve the problem.

In evaluating endangerment, EPA is determining whether the risks to health and welfare from the air pollution amount to endangerment. As commenters recognize, that calls for evaluating and projecting the nature and types of risks from the air pollution, including the probability or likelihood of the occurrence of an impact and the degree of adversity (or benefit) of such an impact. This issue focuses on how

EPA makes such an evaluation in determining endangerment—does EPA look at the risks assuming no planned adaptation and/or mitigation, although EPA projects some degree is likely to occur, or does EPA look at the risks remaining after some projection of adaptation and/or mitigation?

These two approaches reflect different views of the core question EPA is trying to answer. The first approach most clearly focuses on just the air pollution and its impacts, and aims to separate this from the human and societal responses that may or should be taken in response to the risks from the air pollution. By its nature, this separation means this approach may not reflect the actual conditions in the real world in the future, because adaptation and/or mitigation may occur and change the risks. For example, adaptation would not change the atmospheric concentrations, or the likelihood or probability of various impacts occurring (e.g., it would not change the degree of sea level rise), but adaptation has the potential to reduce the adversity of the effects that do occur from these impacts. Mitigation could reduce the atmospheric concentrations that would otherwise occur, having the potential to reduce the likelihood or probability of various impacts occurring. Under this approach, the evaluation of risk is focused on the risk if we do not address the problem. It does not answer the question of how much risk we project will remain after we do address the problem, through either adaptation or mitigation or some combination of the two.

The second approach, suggested by commenters, would call for EPA to project into the future adaptation and/or mitigation, and the effect of these measures in reducing the risks to health or welfare from the air pollution. Commenters argue this will better reflect likely real world conditions, and therefore is needed to allow for an appropriate determination of whether EPA should, at this time, make an affirmative endangerment finding. However, this approach would not separate the air pollution and its impacts from the human and societal responses to the air pollution. It would intentionally and inextricably intertwine them. It would inexorably change the focus from how serious is the air pollution problem we need to address to how good a job are people and society likely to do in addressing or solving the problem. In addition it would dramatically increase the complexity of the issues before EPA.

The context for this endangerment finding is a time span of several decades

into the future. It involves a wide variety of differing health and welfare effects, and almost every sector in our society. This somewhat unique context tends to amplify the differences between the two different approaches. It also means that it is hard to cleanly implement either approach. For example, it is hard under the first approach to clearly separate impacts with and without adaption, given the nature of the scientific studies and information before us. Under the second approach it would be extremely hard to make a reasoned projection of human and societal adaptation and mitigation responses, because these are basically not scientific or technical judgments, but are largely political judgments for society or individual personal judgments.

However, the context for this endangerment finding does not change the fact that at their core the two different approaches are aimed at answering different questions. The first approach is focused on answering the question of what are the risks to public health and welfare from the air pollution if we do not take action to address it. The second approach is focused on answering the question of how much risk will remain assuming some projection of how people and society will respond.

EPA believes that it is appropriate and reasonable to interpret CAA section 202(a) as calling for the first approach. The structure of CAA section 202(a) and the various other similar provisions indicate an intention by Congress to separate the question of what is the problem we need to address from the question of what is the appropriate way to address it. The first approach is clearly more consistent with this statutory structure. The amount of reduction in risk that might be achieved through adaptation and/or mitigation is closely related to the way to address a problem, and is not focused on what is the problem that needs to be addressed. It helps gauge the likelihood of success in addressing a problem, and how good a job society may do in reducing risk; it is not at all as useful in determining the severity of the problem that needs to be addressed.

The endangerment issue at its core is a decision on whether there is a risk to health and welfare that needs to be addressed, and the second approach would tend to indicate that the more likely a society is to solve a problem, the less likely there is a problem that needs to be addressed. This would mask the issue and provide a directionally wrong signal. Assume two different situations, both presenting the same serious risks to

public health or welfare without consideration of adaptation or mitigation. The more successful society is projected to be in solving the serious problem in the future would mean the less likely we would be to make an endangerment finding at the inception identifying it as a problem that needs to be addressed. This is much less consistent with the logic embodied in CAA section 202(a), which separates the issue of whether there is a problem from the issue of what can be done to successfully address it.

In addition, the second approach would dramatically increase the complexity of the issues to resolve, and would do this by bringing in issues that are not the subject of the kind of scientific or technical judgments that Congress envisioned for the endangerment test. The legislative history indicates Congress was focused on issues of science and medicine, including issues at the frontiers of these fields. It referred to data, research resources, science and medicine, chemistry, biology, and statistics. There is no indication Congress envisioned exercising judgment on the very different types of issues involved in projecting the political actions likely to be taken by various local, State, and Federal governments, or judgments on the business or other decisions that are likely to be made by companies or other organizations, or the changes in personal behavior that may be occasioned by the adverse impacts of air pollution. The second approach would take EPA far away from the kind of judgments Congress envisioned for the endangerment test.

D. Geographic Scope of Impacts

It is the Administrator's view that the primary focus of the vulnerability, risk, and impact assessment is the United States. As described in Section IV of these Findings, the Administrator gives some consideration to climate change effects in world regions outside of the United States. Given the global nature of climate change, she has also examined potential impacts in other regions of the world. Greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment, but other regions of the world as well. Likewise, emissions in other countries can affect the United States. Furthermore, impacts in other regions of the world may have consequences that in turn raise humanitarian, trade, and national security concerns for the United States.

Commenters argue that EPA does not have the authority to consider

international effects. They contend that the burden is on EPA is to show endangerment based on impacts in the United States. They note that EPA proposed this approach, which is the only relevant issue for EPA. The purpose of CAA section 202(a), as the stated purpose of the CAA, commenters note, is to protect the quality of the nation's air resources and to protect the health and welfare of the U.S. population. Thus, they continue, international public health and welfare are not listed or stated, and are not encompassed by these provisions. Moreover, they argue that Congress addressed international impacts expressly in two other provisions of the CAA. They note that under CAA section 115, EPA considers emissions of pollutants that cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare in a foreign country, and that CAA section 179B addresses emissions of air pollutants in foreign countries that interfere with attainment of a National Ambient Air Quality Standards (NAAQS) in the United States. Because Congress intentionally addressed international impacts in those provision, commenters argue that the absence of this direction in CAA section 202(a) means that EPA is not to consider international effects when assessing endangerment under this provision.

Commenters fail to recognize that EPA's consideration of international effects is directed at evaluating their impact on the public health and welfare of the U.S. population. EPA is not considering international effects to determine whether the health and welfare of the public in a foreign country is endangered. Instead, EPA's consideration of international effects for purposes of determining endangerment is limited to how those international effects impact the health and welfare of the U.S. population.

The Administrator looked first at impacts in the United States itself, and determined that these impacts are reasonably anticipated to endanger the public health and the welfare of the U.S. population. That remains the Administrator's position, and by itself supports her determination of endangerment. The Administrator also considered the effects of global climate change outside the borders of the United States and evaluated them to determine whether these international effects impact the U.S. population, and if so whether it impacts the U.S. population in a manner that supports or does not support endangerment to the health and welfare of the U.S. public. She is not evaluating international effects to

determine whether populations in a foreign country are endangered. The Administrator is looking at international effects solely for the purpose of evaluating their effects on the U.S. population.

For example, the U.S. population can be impacted by effects in other countries. These international effects can impact U.S. economic, trade, and humanitarian and national security interests. These would be potential effects on the U.S. population, brought about by the effects of climate change occurring outside the United States. It is fully reasonable and rational to expect that events occurring outside our borders can affect the U.S. population.

Thus, commenters misunderstand the role that international effects played in the proposal. The Administrator is not evaluating the impact of international effects on populations outside the United States; she is considering what impact these international effects could have on the U.S. population. That is fully consistent with the CAA's stated purpose of protecting the health and welfare of this nation's population.

E. Temporal Scope of Impacts

An additional parameter of the endangerment analysis is the timeframe. The Administrator's view is that the timeframe over which vulnerabilities, risks, and impacts are considered should be consistent with the timeframe over which greenhouse gases, once emitted, have an effect on climate. Thus the relevant time frame is decades to centuries for the primary greenhouse gases of concern. Therefore, in addition to reviewing recent observations, the underlying science upon which the Administrator is basing her findings generally considers the next several decades—the time period out to around 2100, and for certain impacts, the time period beyond 2100. How the accumulation of atmospheric greenhouse gases and resultant climate change may affect current and future generations is discussed in section IV in these Findings. By current generations we mean a near-term time frame of approximately the next 10 to 20 years; by future generations we mean a longer-term time frame extending beyond that. Some public comments were received that questioned making an endangerment finding based on current conditions, while others questioned EPA's ability to make an endangerment finding based on future projected conditions. Some of these comments are likewise addressed in Section IV in these Findings; and all comments on these temporal issues are addressed in the Response to Comments document.

F. Impacts of Potential Future Regulations and Processes That Generate Greenhouse Gas Emissions

This action is a stand-alone set of findings regarding endangerment and cause or contribute for greenhouse gases under CAA section 202(a), and does not contain any regulatory requirements. Therefore, this action does not attempt to assess the impacts of any future regulation. Although EPA would evaluate any future proposed regulation, many commenters argue that such a regulatory analysis should be part of the endangerment analysis.

Numerous commenters argue that EPA must fully consider the adverse and beneficial impacts of regulation together with the impacts of inaction, and describe this balancing as “risk-risk analysis,” “health-health analysis,” and most predominantly “risk tradeoff analysis.” Commenters argue that EPA’s final endangerment finding would be arbitrary unless EPA undertakes this type of risk trade-off analysis.

Commenters specifically argue that EPA must consider the economic impact of regulation, including the Prevention of Significant Deterioration (PSD) permitting program for major stationary sources because it is triggered by a CAA section 202(a) standard, when assessing whether there is endangerment to public welfare. In other words, they argue that the Administrator should determine if finding endangerment and regulating greenhouse gases under the CAA would be worse for public health and welfare than not regulating. Commenters also argue that the reference to “public” health or welfare in CAA section 202, as well as the fact that impacts on the economy should be considered impacts to welfare, especially requires EPA to consider the full range of possible impacts of regulation. Commenters provide various predictions regarding how regulating greenhouse gases under the CAA more broadly will impact the public, industry, states the overall economy, and thus, they conclude, public health and welfare. Examples of commenters’ predictions include potential adverse impacts on (1) the housing industry and the availability of affordable housing, (2) jobs and income due to industry moving overseas, (3) the agriculture industry and its ability to provide affordable food, and (4) the nation’s energy supply. They also cite to the letter from the Office of Management and Budget provided with the ANPR, as well as interagency comments on the draft Proposed Findings, in support of their argument.

At least one commenter argues that EPA fails to discuss the public health or

welfare benefits of the processes that produce the emissions. The commenter contends that for purposes of CAA section 202(a), this process would be the combustion of gasoline or other transportation fuel in new motor vehicles, and that for purposes of other CAA provisions with similar endangerment finding triggers, the processes would be the combustion of fossil fuel for electric generation and other activities. The commenter continues that EPA’s decision to limit its analysis to the perceived detrimental aspects of emissions after they enter the atmosphere—as opposed to the possible positive aspects of emissions because of the processes that create the emissions—is based on EPA’s overly narrow interpretation of both the meaning of the term “emission” in CAA section 202(a) (and therefore in other endangerment finding provisions) and the intent of these provisions. The commenter states that logically, it makes little sense to limit the definition of the term “emission” to only the “air pollutants” that are emitted. The commenter concludes that when EPA assesses whether the emission of greenhouse gases endanger public health and welfare, EPA must assess the dangers and benefits on both sides of the point where the emissions occur: in the atmosphere where the emissions lodge and, on the other side of the emitting stack or structure, in the processes that create the emissions. Otherwise, EPA will not be able to accurately assess whether the fact that society emits greenhouse gases is a benefit or a detriment. The commenter states that because greenhouse gas emissions, particularly carbon dioxide emissions, are so closely tied with all facets of modern life, a finding that greenhouse gas emissions endanger public health and welfare is akin to saying that modern life endangers public health or welfare. The commenter states that simply cannot be true because the lack of industrial activity that causes greenhouse gas emissions would pose other, almost certainly more serious health and welfare consequences.

Finally, some commenters argue that the impact of regulating under CAA section 202(a) supports making a final, negative endangerment finding. These commenters contend that the incredible costs associated with using the inflexible regulatory structure of the CAA will harm public health and welfare, and therefore EPA should exercise its discretion and find that greenhouse gases do not endanger public health and welfare because once

EPA makes an endangerment finding under CAA section 202(a), it will be forced to regulate greenhouse gases under a number of other sections of the CAA, resulting in regulatory chaos.

At their core, these comments are not about whether commenters believe greenhouse gases may reasonably be anticipated to endanger public health or welfare, but rather about commenters’ dissatisfaction with the decisions that Congress made regarding the response to any endangerment finding that EPA makes under CAA section 202(a). These comments do not discuss the science of greenhouse gases or climate change, or the impacts of climate change on public health or welfare. Instead they muddle the rather straightforward scientific judgment about whether there may be endangerment by throwing the potential impact of responding to the danger into the initial question. To use an analogy, the question of whether the cure is worse than the illness is different than the question of whether there is an illness in the first place. The question of whether there is endangerment is like the question of whether there is an illness. Once one knows there is an illness, then the next question is what to do, if anything, in response to that illness.

What these comments object to is that Congress has already made some decisions about next steps after a finding of endangerment, and commenters are displeased with the results. But if this is the case, commenters should take up their concerns with Congress, not EPA. EPA’s charge is to issue new motor vehicle standards under CAA section 202(a) applicable to emissions of air pollutants that cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare. It is not to find that there is no endangerment in order to avoid issuing those standards, and dealing with any additional regulatory impact.

Indeed, commenters’ argument would insert policy considerations into the endangerment decision, an approach already rejected by the Supreme Court. First, as discussed in Section I.B of these Findings, in *Massachusetts v. EPA*, the court clearly indicated that the Administrator’s decision must be a “scientific judgment.” 549 U.S. at 534. She must base her decision about endangerment on the science, and not on policy considerations about the repercussions or impact of such a finding.

Second, in considering whether the CAA allowed for economic considerations to play a role in the promulgation of the NAAQS, the

Supreme Court rejected arguments that because many more factors than air pollution might affect public health, EPA should consider compliance costs that produce health losses in setting the NAAQS. *Whitman v. ATA*, 531 U.S. at 457, 466 (2001). To be sure, the language in CAA section 109(b) applicable to the setting of a NAAQS is different than that in CAA section 202(a) regarding endangerment. But the concepts are similar—the NAAQS are about setting standards at a level requisite to protect public health (with an adequate margin of safety) and public welfare, and endangerment is about whether the current or projected future levels may reasonably be anticipated to endanger public health or welfare. In other words, both decisions essentially are based on assessing the harm associated with a certain level of air pollution.

Given this similarity in purpose, as well as the Court's instructions in *Massachusetts v. EPA* that the Administrator should base her decision on the science, EPA reasonably interprets the statutory endangerment language to be analogous to setting the NAAQS. Therefore, it is reasonable to interpret the endangerment test as not requiring the consideration of the impacts of implementing the statute in the event of an endangerment finding as part of the endangerment finding itself.¹⁶

Moreover, EPA does not believe that the impact of regulation under the CAA as a whole, let alone that which will result from this particular endangerment finding, will lead to the panoply of adverse consequences that commenters predict. EPA has the ability to fashion a reasonable and common-sense approach to address greenhouse gas emissions and climate change. The Administrator thinks that EPA has and will continue to take a measured approach to address greenhouse gas emissions. For example, the Agency's recent Mandatory Greenhouse Gas Reporting Rule focuses on only the largest sources of greenhouse gases in order to reduce the burden on smaller facilities.¹⁷

¹⁶ Indeed, some persons may argue that due to the similarities between setting a NAAQS and making an endangerment finding, EPA cannot consider the impacts of implementation of the statute.

¹⁷ Note that it is EPA's current position that these Final Findings do not make well-mixed greenhouse gases "subject to regulation" for purposes of the CAA's Prevention of Significant Deterioration (PSD) and title V programs. See, e.g., memorandum entitled "EPA's Interpretation of Regulations that Determine Pollutants Covered By Federal Prevention of Significant Deterioration (PSD) Permit Program" (Dec. 18, 2008). While EPA is reconsidering this memorandum and is seeking

We also note that commenters' approach also is another version of the argument that EPA must consider adaptation and mitigation in the endangerment determination. Just as EPA should consider whether mitigation would *reduce* endangerment, commenters argue we should consider whether mitigation would *increase* endangerment. But as discussed previously, EPA disagrees and believes its approach better achieves the goals of the statute.

Finally, EPA simply disagrees with the commenter who argues that because we are better off now than before the industrial revolution, greenhouse gases cannot be found to endanger public health or welfare. As the DC Circuit noted in the *Ethyl* decision, "[m]an's ability to alter his environment has developed far more rapidly than his ability to foresee with certainty the effects of his alterations." See *Ethyl Corp.*, 541 F.2d at 6. The fact that we as a society are better off now than 100 years ago, and that processes that produce greenhouse gases are a large part of this improvement, does not mean that those processes do not have unintended adverse impacts. It also was entirely reasonable for EPA to look at "emissions" as the pollution once it is emitted from the source into the air, and not also as the process that generates the pollution. Indeed, the definition of "air pollutant" talks in terms of substances "emitted into or otherwise enter[ing] the ambient air" (CAA section 302(g)). It is entirely appropriate for EPA to consider only the substance being emitted as the air pollution or air pollutant.

IV. The Administrator's Finding That Greenhouse Gases Endanger Public Health and Welfare

The Administrator finds that elevated concentrations of greenhouse gases in

public comment on the issues raised in it generally, including whether a final endangerment finding should trigger PSD, the effectiveness of the positions provided in the memorandum was not stayed pending that reconsideration. Prevention of Significant Deterioration (PSD): Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by the Federal PSD Permit Program, 74 FR 515135, 51543–44 (Oct. 7, 2009). In addition, EPA has proposed new temporary thresholds for greenhouse gas emissions that define when PSD and title V permits are required for new or existing facilities. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (74 FR 55292, October 27, 2009). The proposed thresholds would "tailor" the permit programs to limit which facilities would be required to obtain PSD and title V permits. As noted in the preamble for the tailoring rule proposal, EPA also intends to evaluate ways to streamline the process for identifying GHG emissions control requirements and issuing permits. See the Response to Comments Document, Volume 11, and the Tailoring Rule, for more information.

the atmosphere may reasonably be anticipated to endanger the public health and to endanger the public welfare of current and future generations. The Administrator is making this finding specifically with regard to six key directly-emitted, long-lived and well-mixed greenhouse gases: Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The Administrator is making this judgment based on both current observations and projected risks and impacts into the future. Furthermore, the Administrator is basing this finding on impacts of climate change within the United States. However, the Administrator finds that when she considers the impacts on the U.S. population of risks and impacts occurring in other world regions, the case for endangerment to public health and welfare is only strengthened.

A. The Air Pollution Consists of Six Key Greenhouse Gases

The Administrator must define the scope and nature of the relevant air pollution for the endangerment finding under CAA section 202(a). In this final action, the Administrator finds that the air pollution is the combined mix of six key directly-emitted, long-lived and well-mixed greenhouse gases (henceforth "well-mixed greenhouse gases"), which together, constitute the root cause of human-induced climate change and the resulting impacts on public health and welfare. These six greenhouse gases are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

EPA received public comments on this definition of air pollution from the Proposed Findings, and summarizes responses to some of those key comments below; fuller responses to public comments can be found in EPA's Response to Comments document, Volume 9. The Administrator acknowledges that other anthropogenic climate forcers also play a role in climate change. Many public comments either supported or opposed inclusion of other substances in addition to the six greenhouse gases for the definition of air pollution. EPA's responses to those comments are also summarized below, and in volume 9 of the Response to Comments document.

The Administrator explained her rationale for defining air pollution under CAA section 202(a) as the combined mix of the six greenhouse gases in the Proposed Findings. After review of the public comments, the Administrator is using the same definition of the air pollution in the

final finding, for the following reasons: (1) These six greenhouse gas share common properties regarding their climate effects; (2) these six greenhouse gases have been estimated to be the primary cause of human-induced climate change, are the best understood drivers of climate change, and are expected to remain the key driver of future climate change; (3) these six greenhouse gases are the common focus of climate change science research and policy analyses and discussions; (4) using the combined mix of these gases as the definition (versus an individual gas-by-gas approach) is consistent with the science, because risks and impacts associated with greenhouse gas-induced climate change are not assessed on an individual gas approach; and (5) using the combined mix of these gases is consistent with past EPA practice, where separate substances from different sources, but with common properties, may be treated as a class (e.g., oxides of nitrogen).

1. Common Physical Properties of the Six Greenhouse Gases

The common physical properties relevant to the climate change problem shared by the six greenhouse gases include the fact that they are long-lived in the atmosphere. "Long-lived" is used here to mean that the gas has a lifetime in the atmosphere sufficient to become globally well mixed throughout the entire atmosphere, which requires a minimum atmospheric lifetime of about one year.¹⁸ Thus, this definition of air pollution is global in nature because the greenhouse gas emissions emitted from the United States (or from any other region of the world) become globally well mixed, such that it would not be meaningful to define the air pollution as the greenhouse gas concentrations over the United States as somehow being distinct from the greenhouse gas concentrations over other regions of the world.

It is also well established that each of these gases can exert a warming effect on the climate by trapping in heat that would otherwise escape to space. These

six gases are directly emitted as greenhouse gases rather than forming as a greenhouse gas in the atmosphere after emission of a pre-cursor gas. Given these properties, the magnitude of the warming effect of each of these gases is generally better understood than other climate forcing agents that do not share these same properties (addressed in more detail below). The ozone-depleting substances that include chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HFCs) also share the same physical attributes discussed here, but for reasons discussed throughout the remainder of this section are not being included in the Administrator's definition of air pollution for this finding.

2. Evidence That the Six Greenhouse Gases Are the Primary Driver of Current and Projected Climate Change

a. Key Observations Driven Primarily by the Six Greenhouse Gases

The latest assessment of the USGCRP, as summarized in EPA's TSD, confirms the evidence presented in the Proposed Findings that current atmospheric greenhouse gas concentrations are now at elevated and essentially unprecedented levels as a result of both historic and current anthropogenic emissions. The global atmospheric carbon dioxide concentration has increased about 38 percent from pre-industrial levels to 2009, and almost all of the increase is due to anthropogenic emissions. The global atmospheric concentration of methane has increased by 149 percent since pre-industrial levels (through 2007); and the nitrous oxide concentration has increased 23 percent (through 2007). The observed concentration increase in these gases can also be attributed primarily to anthropogenic emissions. The industrial fluorinated gases have relatively low concentrations, but these concentrations have also been increasing and are almost entirely anthropogenic in origin.

Historic data show that current atmospheric concentrations of the two most important directly emitted, long-lived greenhouse gases (carbon dioxide and methane) are well above the natural range of atmospheric concentrations compared to at least the last 650,000 years. Atmospheric greenhouse gas concentrations have been increasing because anthropogenic emissions are outpacing the rate at which greenhouse gases are removed from the atmosphere by natural processes over timescales of decades to centuries. It also remains clear that these high atmospheric concentrations of greenhouse gases are

the unambiguous result of human activities.

Together the six well-mixed greenhouse gases constitute the largest anthropogenic driver of climate change.¹⁹ Of the total anthropogenic heating effect caused by the accumulation of the six well-mixed greenhouse gases plus other warming agents (that do not meet all of the Administrator's criteria that pertain to the six greenhouse gases) since pre-industrial times, the combined heating effect of the six well-mixed greenhouses is responsible for roughly 75 percent, and it is expected that this share may grow larger over time, as discussed below.

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. Global mean surface temperatures have risen by 0.74 °C (1.3 °F) (±0.18 °C) over the last 100 years. Eight of the 10 warmest years on record have occurred since 2001. Global mean surface temperature was higher during the last few decades of the 20th century than during any comparable period during the preceding four centuries.

The global surface temperature record relies on three major global temperature datasets, developed by NOAA, NASA, and the United Kingdom's Hadley Center. All three show an unambiguous warming trend over the last 100 years, with the greatest warming occurring over the past 30 years.²⁰ Furthermore, all three datasets show that eight of the 10 warmest years on record have occurred since 2001; that the 10 warmest years have all occurred in the past 12 years; and that the 20 warmest years have all occurred since 1981. Though most of the warmest years on record have occurred in the last decade in all available datasets, the rate of warming has, for a short time in the

¹⁸ The IPCC also refers to these six GHGs as long-lived. Methane has an atmospheric lifetime of roughly a decade. One of the most commonly used hydrofluorocarbons (HFC-134a) has a lifetime of 14 years. Nitrous oxide has a lifetime of 114 years; sulfur hexafluoride over 3,000 years; and some PFCs up to 10,000 to 50,000 years. Carbon dioxide in the atmosphere is sometimes approximated as having a lifetime of roughly 100 years, but for a given amount of carbon dioxide emitted a better description is that some fraction of the atmospheric increase in concentration is quickly absorbed by the oceans and terrestrial vegetation, some fraction of the atmospheric increase will only slowly decrease over a number of years, and a small portion of the increase will remain for many centuries or more.

¹⁹ As summarized in EPA's TSD, the global average net effect of the increase in atmospheric greenhouse gas concentrations, plus other human activities (e.g., land use change and aerosol emissions), on the global energy balance since 1750 has been one of warming. This total net heating effect, referred to as forcing, is estimated to be +1.6 (+0.6 to +2.4) Watts per square meter (W/m²), with much of the range surrounding this estimate due to uncertainties about the cooling and warming effects of aerosols. The combined radiative forcing due to the cumulative (i.e., 1750 to 2005) increase in atmospheric concentrations of CO₂, CH₄, and N₂O is estimated to be +2.30 (+2.07 to +2.53) W/m². The rate of increase in positive radiative forcing due to these three GHGs during the industrial era is very likely to have been unprecedented in more than 10,000 years.

²⁰ See section 4 of the TSD for more detailed information about the three global temperature datasets.

Hadley Center record, slowed. However, the NOAA and NASA trends do not show the same marked slowdown for the 1999–2008 period. Year-to-year fluctuations in natural weather and climate patterns can produce a period that does not follow the long-term trend. Thus, each year may not necessarily be warmer than every year before it, though the long-term warming trend continues.²¹

The scientific evidence is compelling that elevated concentrations of heat-trapping greenhouse gases are the root cause of recently observed climate change. The IPCC conclusion from 2007 has been re-confirmed by the June 2009 USGCRP assessment that most of the observed increase in global average temperatures since the mid-20th century is very likely²² due to the observed increase in anthropogenic greenhouse gas concentrations. Climate model simulations suggest natural forcing alone (e.g., changes in solar irradiance) cannot explain the observed warming.

The attribution of observed climate change to anthropogenic activities is based on multiple lines of evidence. The first line of evidence arises from our basic physical understanding of the effects of changing concentrations of greenhouse gases, natural factors, and other human impacts on the climate system. The second line of evidence arises from indirect, historical estimates of past climate changes that suggest that the changes in global surface temperature over the last several decades are unusual.²³ The third line of evidence arises from the use of computer-based climate models to simulate the likely patterns of response of the climate system to different forcing mechanisms (both natural and anthropogenic).

The claim that natural internal variability or known natural external

forcings can explain most (more than half) of the observed global warming of the past 50 years is inconsistent with the vast majority of the scientific literature, which has been synthesized in several assessment reports. Based on analyses of widespread temperature increases throughout the climate system and changes in other climate variables, the IPCC has reached the following conclusions about external climate forcing: “It is extremely unlikely (<5 percent) that the global pattern of warming during the past half century can be explained without external forcing, and very unlikely that it is due to known natural external causes alone” (Hegerl *et al.*, 2007). With respect to internal variability, the IPCC reports the following: “The simultaneous increase in energy content of all the major components of the climate system as well as the magnitude and pattern of warming within and across the different components supports the conclusion that the cause of the [20th century] warming is extremely unlikely (<5 percent) to be the result of internal processes” (Hegerl *et al.*, 2007). As noted in the TSD, the observed warming can only be reproduced with models that contain both natural and anthropogenic forcings, and the warming of the past half century has taken place at a time when known natural forcing factors alone (solar activity and volcanoes) would likely have produced cooling, not warming.

United States temperatures also warmed during the 20th and into the 21st century; temperatures are now approximately 0.7 °C (1.3 °F) warmer than at the start of the 20th century, with an increased rate of warming over the past 30 years. Both the IPCC and CCSP reports attributed recent North American warming to elevated greenhouse gas concentrations. The CCSP (2008g) report finds that for North America, “more than half of this warming [for the period 1951–2006] is likely the result of human-caused greenhouse gas forcing of climate change.”

Observations show that changes are occurring in the amount, intensity, frequency, and type of precipitation. Over the contiguous United States, total annual precipitation increased by 6.1 percent from 1901–2008. It is likely that there have been increases in the number of heavy precipitation events within many land regions, even in those where there has been a reduction in total precipitation amount, consistent with a warming climate.

There is strong evidence that global sea level gradually rose in the 20th century and is currently rising at an

increased rate. It is very likely that the response to anthropogenic forcing contributed to sea level rise during the latter half of the 20th century. It is not clear whether the increasing rate of sea level rise is a reflection of short-term variability or an increase in the longer-term trend. Nearly all of the Atlantic Ocean shows sea level rise during the last 50 years with the rate of rise reaching a maximum (over 2 mm per year) in a band along the U.S. east coast running east-northeast.

Satellite data since 1979 show that annual average Arctic sea ice extent has shrunk by 4.1 percent per decade. The size and speed of recent Arctic summer sea ice loss is highly anomalous relative to the previous few thousands of years.

Widespread changes in extreme temperatures have been observed in the last 50 years across all world regions including the United States. Cold days, cold nights, and frost have become less frequent, while hot days, hot nights, and heat waves have become more frequent.

Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases. However, directly attributing specific regional changes in climate to emissions of greenhouse gases from human activities is difficult, especially for precipitation.

Ocean carbon dioxide uptake has lowered the average ocean pH (increased the acidity) level by approximately 0.1 since 1750. Consequences for marine ecosystems may include reduced calcification by shell-forming organisms, and in the longer term, the dissolution of carbonate sediments.

Observations show that climate change is currently affecting U.S. physical and biological systems in significant ways. The consistency of these observed changes in physical and biological systems and the observed significant warming likely cannot be explained entirely due to natural variability or other confounding non-climate factors.

b. Key Projections Based Primarily on Future Scenarios of the Six Greenhouse Gases

There continues to be no reason to expect that, without substantial and near-term efforts to significantly reduce emissions, atmospheric levels of greenhouse gases will not continue to climb, and thus lead to ever greater rates of climate change. Given the long atmospheric lifetime of the six greenhouse gases, which range from roughly a decade to centuries, future atmospheric greenhouse gas

²¹ Karl T. *et al.*, (2009).

²² The IPCC Fourth Assessment Report uses specific terminology to convey likelihood and confidence. Likelihood refers to a probability that the statement is correct or that something will occur. “Virtually certain” conveys greater than 99 percent probability of occurrence; “very likely” 90 to 99 percent; “likely” 66 to 90 percent. IPCC assigns confidence levels as to the correctness of a statement. “Very high confidence” conveys at least 9 out of 10 chance of being correct; “high confidence” about 8 out of 10 chance; “medium confidence” about 5 out of 10 chance. The USGCRP uses the same or similar terminology in its reports. See also Box 1.2 of the TSD. Throughout this document, this terminology is used in conjunction with statements from the IPCC and USGCRP reports to convey the same meaning that those reports intended. In instances where a word such as “likely” may appear outside the context of a specific IPCC or USGCRP statement, it is not meant to necessarily convey the same quantitative meaning as the IPCC terminology.

²³ Karl T. *et al.* (2009).

concentrations for the remainder of this century and beyond will be influenced not only by future emissions but indeed by present-day and near-term emissions. Consideration of future plausible scenarios, and how our current greenhouse gas emissions essentially commit present and future generations to cope with an altered atmosphere and climate, reinforces the Administrator's judgment that it is appropriate to define the combination of the six key greenhouse gases as the air pollution.

Most future scenarios that assume no explicit greenhouse gas mitigation actions (beyond those already enacted) project increasing global greenhouse gas emissions over the century, which in turn result in climbing greenhouse gas concentrations. Under the range of future emission scenarios evaluated by the assessment literature, carbon dioxide is expected to remain the dominant anthropogenic greenhouse gas, and thus driver of climate change, over the course of the 21st century. In fact, carbon dioxide is projected to be the largest contributor to total radiative forcing in all periods and the radiative forcing associated with carbon dioxide is projected to be the fastest growing. For the year 2030, projections of the six greenhouse gases show an increase of 25 to 90 percent compared with 2000 emissions. Concentrations of carbon dioxide and the other well-mixed gases increase even for those scenarios where annual emissions toward the end of the century are assumed to be lower than current annual emissions. The radiative forcing associated with the non-carbon dioxide well-mixed greenhouse gases is still important and increasing over time. Emissions of the ozone-depleting substances are projected to continue decreasing due to the phase-out schedule under the Montreal Protocol on Substances that Deplete the Ozone Layer. Considerable uncertainties surround the estimates and future projections of anthropogenic aerosols; future atmospheric concentrations of aerosols, and thus their respective heating or cooling effects, will depend much more on assumptions about future emissions because of their short atmospheric lifetimes compared to the six well-mixed greenhouse gases.

Future warming over the course of the 21st century, even under scenarios of low emissions growth, is very likely to be greater than observed warming over the past century. According to climate model simulations summarized by the IPCC, through about 2030, the global warming rate is affected little by the choice of different future emission scenarios. By the end of the century, projected average global warming

(compared to average temperature around 1990) varies significantly depending on emissions scenario and climate sensitivity assumptions, ranging from 1.8 to 4.0 °C (3.2 to 7.2 °F), with an uncertainty range of 1.1 to 6.4 °C (2.0 to 11.5 °F).

All of the United States is very likely to warm during this century, and most areas of the United States are expected to warm by more than the global average. The largest warming is projected to occur in winter over northern parts of Alaska. In western, central and eastern regions of North America, the projected warming has less seasonal variation and is not as large, especially near the coast, consistent with less warming over the oceans.

3. The Six Greenhouse Gases Are Currently the Common Focus of the Climate Change Science and Policy Communities

The well-mixed greenhouse gases are currently the common focus of climate science and policy analyses and discussions. For example, the United Nations Framework Convention on Climate Change (UNFCCC), signed and ratified by the United States in 1992, requires its signatories to "develop, periodically update, publish and make available * * * national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies * * *" ^{24 25} To date, the focus of UNFCCC actions and discussions has been on the six greenhouse gases that are the same focus of these Findings.

Because of these common properties, it has also become common practice to compare these gases on a carbon dioxide equivalent basis, based on each gas's warming effect relative to carbon dioxide (the designated reference gas) over a specified timeframe. For example, both the annual *Inventory of U.S. Greenhouse Gases and Sinks* published by EPA and the recently finalized EPA Mandatory Greenhouse Gas Reporting Rule (74 FR 56260), use the carbon dioxide equivalent metric to

²⁴ Due to the cumulative purpose of the statutory language, even if the Administrator were to look at the atmospheric concentration of each greenhouse gas individually, she would still consider the impact of the concentration of a single greenhouse gas in combination with that caused by the other greenhouse gases.

²⁵ The range of uncertainty in the current magnitude of black carbon's climate forcing effect is evidenced by the ranges presented by the IPCC Fourth Assessment Report (2007) and the more recent study by Ramanathan, V. and Carmichael, G. (2008) Global and regional climate changes due to black carbon. *Nature Geoscience*, 1(4): 221–227.

sum and compare these gases, and thus accept the common climate-relevant properties of these gases for their treatment as a group. This is also common practice internationally as the UNFCCC reporting guidelines for developed countries, and the Clean Development Mechanism procedures for developing countries both require the use of global warming potentials published by the IPCC to convert the six greenhouse gases into their respective carbon dioxide equivalent units.

4. Defining Air Pollution as the Aggregate Group of Six Greenhouse Gases Is Consistent With Evaluation of Risks and Impacts Due to Human-Induced Climate Change

Because the well-mixed greenhouse gases are collectively the primary driver of current and projected human-induced climate change, all current and future risks due to human-induced climate change—whether these risks are associated with increases in temperature, changes in precipitation, a rise in sea levels, changes in the frequency and intensity of weather events, or more directly with the elevated greenhouse gas concentrations themselves—can be associated with this definition of air pollution.

5. Defining the Air Pollution as the Aggregate Group of Six Greenhouse Gases Is Consistent With Past EPA Practice

Treating the air pollution as the aggregate of the well-mixed greenhouse gases is consistent with other provisions of the CAA and previous EPA practice under the CAA, where separate emissions from different sources but with common properties may be treated as a class (e.g., particulate matter (PM)). This approach addresses the total, cumulative effect that the elevated concentrations of the six well-mixed greenhouse gases have on climate, and thus on different elements of health, society and the environment.²⁴

EPA treats, for example, PM as a common class of air pollution; PM is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles.

6. Other Climate Forcers Not Being Included in the Definition of Air Pollution for This Finding

Though the well-mixed greenhouse gases that make up the definition of air pollution for purposes of making the endangerment decision under CAA section 202(a) constitute the primary

driver of human-induced climate change, there are other substances emitted from human activities that contribute to climate change and deserve careful attention, but are not being included in the air pollution definition for this particular action. These substances are discussed immediately below.

a. Black Carbon

Several commenters request that black carbon be included in the definition of air pollution because of its warming effect on the climate. Black carbon is not a greenhouse gas, rather, it is an aerosol particle that results from the incomplete combustion of carbon contained in fossil fuels and biomass, and remains in the atmosphere for only about a week. Unlike any of the greenhouse gases being addressed by this action, black carbon is a component of particulate matter (PM), where PM is a criteria air pollutant under section 108 of the CAA. The extent to which black carbon makes up total PM varies by emission source, where, for example, diesel vehicle PM emissions contain a higher fraction of black carbon compared to most other PM emission sources. Black carbon causes a warming effect primarily by absorbing incoming and reflected sunlight (whereas greenhouse gases cause warming by trapping outgoing, infrared heat), and by darkening bright surfaces such as snow and ice, which reduces reflectivity. This latter effect, in particular, has been raising concerns about the role black carbon may be playing in observed warming and ice melt in the Arctic.

As stated in the April 2009 Proposed Findings, there remain some significant scientific uncertainties about black carbon's total climate effect,²⁵ as well as concerns about how to treat the short-lived black carbon emissions alongside the long-lived, well-mixed greenhouse gases in a common framework (*e.g.*, what are the appropriate metrics to compare the warming and/or climate effects of the different substances, given that, unlike greenhouse gases, the magnitude of aerosol effects can vary immensely with location and season of emissions). Nevertheless, the Administrator recognizes that black carbon is an important climate forcing agent and takes very seriously the emerging science on black carbon's contribution to global climate change in general and the high rates of observed climate change in the Arctic in particular. As noted in the Proposed Findings, EPA has various pending petitions under the CAA calling on the Agency to make an endangerment

finding and regulate black carbon emissions.

b. Other Climate Forcers

There are other climate forcers that play a role in human-induced climate change that were mentioned in the Proposed Findings, and were the subject of some public comments. These include the stratospheric ozone-depleting substances, nitrogen trifluoride (NF₃), water vapor, and tropospheric ozone.

As mentioned above, the ozone-depleting substances (CFCs and HCFCs) do share the same physical, climate-relevant attributes as the six well-mixed greenhouse gases; however, emissions of these substances are playing a diminishing role in human-induced climate change. They are being controlled and phased out under the Montreal Protocol on Substances that Deplete the Ozone Layer. Because of this, the major scientific assessment reports such as those from IPCC focus primarily on the same six well-mixed greenhouse gases included in the definition of air pollution in these Findings. It is also worth noting that the UNFCCC, to which the United States is a signatory, addresses "all greenhouse gases not controlled by the Montreal Protocol."²⁶ One commenter noted that because the Montreal Protocol controls production and consumption of ozone-depleting substances, but not existing banks of the substances, that CFCs should be included in the definition of air pollution in this finding, which might, in turn, create some future action under the CAA to address the banks of ozone-depleting substances as a climate issue. However, the primary criteria for defining the air pollution in this finding is the focus on the core of the climate change problem, and concerns over future actions to control depletion of stratospheric ozone are separate from and not central to the air pollution causing climate change.

Nitrogen trifluoride also shares the same climate-relevant attributes as the six well-mixed greenhouse gases, and it is also included in EPA's Mandatory Greenhouse Gas Reporting Rule (FR 74 56260). However, the Administrator is maintaining the reasoning laid out in the Proposed Findings to not include NF₃ in the definition of air pollution for this finding because the overall magnitude of its forcing effect on climate is not yet well quantified. EPA will continue to track the science on NF₃.

A number of public comments question the exclusion of water vapor

from the definition of air pollution because it is the most important greenhouse gas responsible for the natural, background greenhouse effect. The Administrator's reasoning for excluding water vapor, was described in the Proposed Findings and is summarized here with additional information in Volume 10 of the Response to Comments document. First, climate change is being driven by the buildup in the atmosphere of greenhouse gases. The direct emissions primarily responsible for this are the six well-mixed greenhouse gases. Direct anthropogenic emissions of water vapor, in general, have a negligible effect and are thus not considered a primary driver of human-induced climate change. EPA plans to further evaluate the issues of emissions of water that are implicated in the formation of contrails and also changes in water vapor due to local irrigation. At this time, however, the findings of the IPCC state that the total forcing from these sources is small and that the level of understanding is low.

Water produced as a byproduct of combustion at low altitudes has a negligible contribution to climate change. The residence time of water vapor is very short (days) and the water content of the air in the long term is a function of temperature and partial pressure, with emissions playing no role. Additionally, the radiative forcing of a given mass of water at low altitudes is much less than the same mass of carbon dioxide. Water produced at higher altitudes could potentially have a larger impact. The IPCC estimated the contribution of changes in stratospheric water vapor due to methane and other sources, as well as high altitude contributions from contrails, but concluded that both contributions were small, with a low level of understanding. The report also addressed anthropogenic contributions to water vapor arising from large scale irrigation, but assigned it a very low level of understanding, and suggested that the cooling from evaporation might outweigh the warming from its small radiative contribution.

Increases in tropospheric ozone concentrations have exerted a significant anthropogenic warming effect since pre-industrial times. However, as explained in the Proposed Findings, tropospheric ozone is not a long-lived, well-mixed greenhouse gas, and it is not directly emitted. Rather it forms in the atmosphere from emissions of pre-cursor gases. There is increasing attention in climate change research and the policy community about the extent to which further reductions in tropospheric ozone levels may help

²⁶ UNFCCC, Art. 4.1(b).

slow down climate change in the near term. The Administrator views this issue seriously but maintains that tropospheric ozone is sufficiently different such that it deserves an evaluation and treatment separate from this finding.

7. Summary of Key Comments on Definition of Air Pollution

a. It Is Reasonable for the Administrator To Define the Air Pollution as Global Concentrations of the Well-Mixed Greenhouse Gases

Many commenters argue that EPA does not have the authority to establish domestic rights and obligations based on environmental conditions that are largely attributed to foreign nations and entities that are outside the jurisdiction of EPA under the CAA. They contend that in this case, the bulk of emissions that would lead to mandatory emissions controls under the CAA would not and could not be regulated under the CAA. They state that CAA requirements cannot be enforced against foreign sources of air pollution, and likewise domestic obligations under the CAA cannot be caused by foreign emissions that are outside the United States. The commenters argue that EPA committed procedural error by not addressing this legal issue of authority in the proposal.

Commenters cite no statutory text or judicial authority for this argument, and instead rely entirely on an analogy to the issues concerning the exercise of extra-territorial jurisdiction. The text of CAA section 202(a), however, does not support this claim. Nothing in CAA section 202(a) limits the term air pollution to those air pollution matters that are caused solely or in large part by domestic emissions. The only issue under CAA section 202(a) is whether the air pollution is reasonably anticipated to endanger, and whether emissions from one domestic source category—new motor vehicles—cause or contribute to this air pollution. Commenters would read into this an additional cause or contribute test—whether foreign sources cause or contribute to the air pollution in such a way that the air pollution is largely attributable to the foreign emissions, or the bulk of emissions causing the air pollution are from foreign sources. There is no such provision in CAA section 202(a). Congress was explicit about the contribution test it imposed, and the only source that is relevant for purposes of contribution is new motor vehicles. Commenters suggest an ill-defined criterion that is not in the statute.

In addition, as discussed in Section II of these Findings, Congress intentionally meant the agency to judge the air pollution endangerment criteria based on the “cumulative impact of all sources of a pollutant,” and not an incremental look at just the endangerment from a subset of sources. Commenters’ arguments appear to lead to this result. Under the commenters’ approach, in those cases where the bulk of emissions which form the air pollution come from foreign sources, EPA apparently would have no authority to make an endangerment finding. Logically, EPA would be left with the option of identifying and evaluating the air pollution attributable to domestic sources alone, and determining whether that narrowly defined form of air pollution endangers public health or welfare. This is the kind of unworkable, incremental approach that was rejected by the court in *Ethyl* and by Congress in the 1977 amendments adopting this provision.

The analogy to extra-territorial jurisdiction is also not appropriate. The endangerment finding itself does not exercise jurisdiction over any source, domestic or foreign. It is a judgment that is a precondition for exercising regulatory authority. Under CAA section 202(a), any exercise of regulatory authority following from this endangerment finding would be for new motor vehicles either manufactured in the United States or imported into the United States. There would be no extra-territorial exercise of jurisdiction. The core issues for endangerment focus on impacts inside the United States, not outside the United States. In addition, the contribution finding is based solely on the contribution from new motor vehicles built in or imported to the United States. The core judgments that need to be made under CAA section 202(a) are all focused on actions and impacts inside the United States. This does not raise any concerns about an extra-territorial exercise of jurisdiction. The basis for the endangerment and contribution findings is fully consistent with the principles underlying the desire to avoid exercises of extra-territorial jurisdiction. Any limitations on the ability to exercise control over foreign sources of emissions does not, however, call into question the authority under CAA section 202 to exercise control over domestic sources of emissions based on their contribution to an air pollution problem that is judged to endanger public health or welfare based on impacts occurring in the United States or otherwise affecting the United States and its citizens.

In essence, commenters are concerned about the effectiveness of the domestic control strategies that can be adopted to address a global air pollution problem that is caused only in part by domestic sources of emissions. While that is a quite valid and important policy concern, it does not translate into a legal limitation on EPA’s authority to make an endangerment finding. Neither the text nor the legislative history of CAA section 202(a) support such an interpretation and Congress explicitly separated the decision on endangerment from the decision on what controls are required or appropriate once an affirmative endangerment finding has been made. The effectiveness of the resulting regulatory controls is not a relevant factor to determining endangerment.

EPA also committed no procedural flaw as argued by commenters. The proposal fully explored the interpretation of endangerment and cause or contribution under CAA section 202(a), and was very clear that EPA was considering air pollution to mean the elevated global concentration of greenhouse gases in the atmosphere, recognizing that these atmospheric concentrations were the result of world wide emissions, not just or even largely U.S. emissions. The separation of the effectiveness of the control strategy from the endangerment criteria, and the need to consider the cumulative impact of all sources in evaluating endangerment was clearly discussed. Commenters received fair notice of EPA’s proposal and the basis for it.

Similarly, some commenters argue that EPA’s proposal defines air pollution as global air pollution, but EPA is limited to evaluating domestic air only; in other words that EPA may only regulate domestic emissions with localized effects. They argue this limitation derives from the purpose of the CAA—to enhance the quality of the Nation’s air resources, recognizing that air pollution prevention and control focus on the sources of the emissions, and are the primary responsibility of States and local governments. Therefore, commenters continue, that “air pollution” has to be air pollution that originates domestically and is to be addressed only at the domestic source. Sections 115 and 179B of the CAA, as discussed below, reflect this intention as well. The result, they conclude, is that “air pollution” as used in CAA section 202(a), includes only pollution that originates domestically, where the effects occur locally. They argue EPA has improperly circumvented this by a “local-global-local” analysis that injects

global air pollution into the middle of the endangerment test.

The statutory arguments made by the commenters attempt to read an unrealistic limitation into the general provisions discussed. The issues are similar in nature to those raised by the commenters arguing that EPA has no authority to establish domestic rights and obligations based on environmental conditions that are largely attributable to emissions from foreign nations and entities that are outside the jurisdiction of EPA under the CAA. In both cases, the question is whether EPA has authority to make an endangerment finding when the air pollution of concern is a relatively homogenous atmospheric concentration of greenhouse gases. According to the commenters, although this global pool includes the air over the United States, and leads to impacts in the United States and on the U.S. population, Congress prohibited EPA from addressing this air pollution problem because of its global aspects.

The text of the CAA does not specifically address this, as the term air pollution is not defined. EPA interprets this term as including the air pollution problem involved in this case—elevated atmospheric concentration of greenhouse gases that occur in the air above the United States as well as across the globe, and where this pool of global gases leads to impacts in the United States and on the U.S. population. This is fully consistent with the statutory provisions discussed by commenters. This approach seeks to protect the Nation's air resources, as clearly the Nation's air resources are an integral part of this global pool. The Nation's air resources by definition are not an isolated atmosphere that only contains molecules emitted within the United States, or an atmosphere that bears no relationship to the rest of the globe's atmosphere. There is no such real world body of air. Protecting the Nation's resources of clean air means to protect the air in the real world, not an artificial construct of "air" that ignores the many situations where the air over our borders includes compounds and pollutants emitted outside our borders, and in this case to ignore the fact that the air over our borders will by definition have elevated concentrations of greenhouse gases only when the air around the globe also has such concentrations. The suggested narrow view of "air pollution" does not further the protection of the Nation's air resources, but instead attempts to limit such protection by defining these resources in a scientifically artificial way that does not comport with how the air in

the atmosphere is formed or changes over time, how it relates to and interacts with air around the globe, and how the result of this can affect the U.S. population.

The approach suggested by commenters fails to provide an actual definition for EPA to follow—for example, would U.S. or domestic "air pollution" be limited to only those air concentrations composed of molecules that originated in the United States? Is there a degree of external gases or compounds that could be allowed? Would it ignore the interaction and relationship between the air over the U.S. borders and the air around the rest of the globe? The latter approach appears to be the one suggested by commenters. Commenters' approach presumably would call for EPA to only consider the effects that derive solely from the air over our borders, and to ignore any effects that occur within the United States that are caused by air around the globe. However the air over the United States will by definition affect climate change only in circumstances where the air around the world is also doing so. The impacts of the air over the United States cannot be assessed separately from the impacts from the global pool, as they occur together and work together to affect the climate. Ignoring the real world nature of the Nation's air resources, in the manner presumably suggested by the commenters, would involve the kind of unworkable, incremental, and artificially isolating approach that was rejected by the court in *Ethyl* and by Congress in 1977. Congress intended EPA to interpret this provision by looking at air pollutants and air pollution problems in a broad manner, not narrowly, to evaluate problems within their broader context and not to attempt to isolate matters in an artificial way that fails to account for the real world context that lead to health and welfare impacts on the public. Commenters' suggested interpretation fails to implement this intention of Congress.

Commenters in various places refer to the control of the pollution, and the need for it to be aimed at local sources. That is addressed in the standard setting portion of CAA section 202(a), as in other similar provisions. The endangerment provision does not address how the air pollution problem should be addressed—who should be regulated and how they should be regulated. The endangerment provision addresses a different issue—is there an air pollution problem that should be addressed? In that context, EPA rejects the artificially narrow interpretation

suggested by the commenters, and believes its broader interpretation in this case is reasonable and consistent with the intention of Congress.

b. Consideration of Greenhouse Gases as Air Pollution Given Their Impact Is Through Climate Rather Than Direct Toxic Effects

A number of commenters argue that carbon dioxide and the other greenhouse gases should not be defined as the air pollution because these gases do not cause direct human health effects, such as through inhalation. Responses to such comments are summarized in Section IV.B.1 of these Findings in the discussion of the public health and welfare nature of the endangerment finding.

c. The Administrator's Reliance on the Global Temperature Data Is a Reasonable Indicator of Human-Induced Climate Change

We received many comments suggesting global temperatures have stopped warming. The commenters base this conclusion on temperature trends over only the last decade. While there have not been strong trends over the last seven to ten years in global surface temperature or lower troposphere temperatures measured by satellites, this pause in warming should not be interpreted as a sign that the Earth is cooling or that the science supporting continued warming is in error. Year-to-year variability in natural weather and climate patterns make it impossible to draw any conclusions about whether the climate system is warming or cooling from such a limited analysis. Historical data indicate short-term trends in long-term time series occasionally run counter to the overall trend. All three major global surface temperature records show a continuation of long-term warming. Over the last century, the global average temperature has warmed at the rate of about 0.13 °F (0.072 °C) per decade in all three records. Over the last 30 years, the global average surface temperature has warmed by about 0.30 °F (0.17 °C) per decade. Eight of the 10 warmest years on record have occurred since 2001 and the 20 warmest years have all occurred since 1981. Satellite measurements of the troposphere also indicate warming over the last 30 years at a rate of 0.20 to 0.27 °F (0.11 °C to 0.15 °C) per decade. Please see the relevant volume of the Response to Comments document for more detailed responses.

Some commenters indicate the global surface temperature records are biased by urbanization, poor siting of instruments, observation methods, and

other factors. Our review of the literature suggests that these biases have in many cases been corrected for, are largely random where they remain, and therefore cancel out over large regions. Furthermore, we note that though the three global surface temperature records use differing techniques to analyze much of the same data, they produce almost the same results, increasing our confidence in their legitimacy. The assessment literature has concluded that warming of the climate system is unequivocal. The warming trend that is evident in all of the temperature records is confirmed by other independent observations, such as the melting of Arctic sea ice, the retreat of mountain glaciers on every continent, reductions in the extent of snow cover, earlier blooming of plants in the spring, and increased melting of the Greenland and Antarctic ice sheets. Please see the relevant volume of the Response to Comments document for more detailed responses.

A number of commenters argue that the warmth of the late 20th century is not unusual relative to the past 1,000 years. They maintain temperatures were comparably warm during the Medieval Warm Period (MWP) centered around 1000 A.D. We agree there was a Medieval Warm Period in many regions but find the evidence is insufficient to assess whether it was globally coherent. Our review of the available evidence suggests that Northern Hemisphere temperatures in the MWP were probably between 0.1 °C and 0.2 °C below the 1961–1990 mean and significantly below the level shown by instrumental data after 1980. However, we note significant uncertainty in the temperature record prior to 1600 A.D. Please see the relevant volume of the Response to Comments document for more detailed responses.

d. Ability To Attribute Observed Climate Change to Anthropogenic, Well-Mixed Greenhouse Gases

Many commenters question the link between observed temperatures and anthropogenic greenhouse gas emissions. They suggest internal variability of the climate system and natural forcings explain observed temperature trends and that anthropogenic greenhouse gases play, at most, a minor role. However, the attribution of most of the recent warming to anthropogenic activities is based on multiple lines of evidence. The first line of evidence arises from our basic physical understanding of the effects of changing concentrations of greenhouse gases, natural factors, and other human impacts on the climate

system. Greenhouse gas concentrations have indisputably increased and their radiative properties are well established. The second line of evidence arises from indirect, historical estimates of past climate changes that suggest that the changes in global surface temperature over the last several decades are unusual. The third line of evidence arises from the use of computer-based climate models to simulate the likely patterns of response of the climate system to different forcing mechanisms (both natural and anthropogenic). These models are unable to replicate the observed warming unless anthropogenic emissions of greenhouse gases are included in the simulations. Natural forcing alone cannot explain the observed warming. In fact, the assessment literature²⁷ indicates the sum of solar and volcanic forcing in the past half century would likely have produced cooling, not warming. Please see the relevant volume of the Response to Comments for more detailed responses.

B. The Air Pollution Is Reasonably Anticipated To Endanger Both Public Health and Welfare

The Administrator finds that the elevated atmospheric concentrations of the well-mixed greenhouse gases may reasonably be anticipated to endanger the public health and welfare of current and future generations. This section describes the major pieces of scientific evidence supporting the Administrator's endangerment finding, discusses both the public health and welfare nature of the endangerment finding, and addresses a number of key issues the Administrator considered when evaluating the state of the science as well as key public comments on the Proposed Findings. Additional detail can be found in the TSD and the Response to Comments document.

As described in Section II of these Findings, the endangerment test under CAA section 202(a) does not require the Administrator to identify a bright line, quantitative threshold above which a

positive endangerment finding can be made. The statutory language explicitly calls upon the Administrator to use her judgment. This section describes the general approach used by the Administrator in reaching the judgment that a positive endangerment finding should be made, as well as the specific rationale for finding that the greenhouse gas air pollution may reasonably be anticipated to endanger both public health and welfare.

First, the Administrator finds the scientific evidence linking human emissions and resulting elevated atmospheric concentrations of the six well-mixed greenhouse gases to observed global and regional temperature increases and other climate changes to be sufficiently robust and compelling. This evidence is briefly explained in more detail in Section V of these Findings. The Administrator recognizes that the climate change associated with elevated atmospheric concentrations of carbon dioxide and the other well-mixed greenhouse gases have the potential to affect essentially every aspect of human health, society and the natural environment. The Administrator is therefore not limiting her consideration of potential risks and impacts associated with human emissions of greenhouse gases to any one particular element of human health, sector of the economy, region of the country, or to any one particular aspect of the natural environment. Rather, the Administrator is basing her finding on the total weight of scientific evidence, and what the science has to say regarding the nature and potential magnitude of the risks and impacts across all climate-sensitive elements of public health and welfare, now and projected out into the foreseeable future.

The Administrator has considered the state of the science on how human emissions and the resulting elevated atmospheric concentrations of well-mixed greenhouse gases may affect each of the major risk categories, *i.e.*, those that are described in the TSD, which include human health, air quality, food production and agriculture, forestry, water resources, sea level rise and coastal areas, the energy sector, infrastructure and settlements, and ecosystems and wildlife. The Administrator understands that the nature and potential severity of impacts can vary across these different elements of public health and welfare, and that they can vary by region, as well as over time.

The Administrator is therefore aware that, because human-induced climate change has the potential to be far-reaching and multi-dimensional, not all

²⁷ Solomon, S., D. Qin, M. Manning, R.B. Alley, T. Berntsen, N.L. Bindoff, Z. Chen, A. Chidthaisong, J.M. Gregory, G.C. Hegerl, M. Heimann, B. Hewitson, B.J. Hoskins, F. Joos, J. Jouzel, V. Kattsov, U. Lohmann, T. Matsuno, M. Molina, N. Nicholls, J. Overpeck, G. Raga, V. Ramaswamy, J. Ren, M. Rusticucci, R. Somerville, T.F. Stocker, P. Whetton, R.A. Wood and D. Wratt (2007) Technical Summary. In: *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Karl, T. et al. (2009).

risks and potential impacts can be characterized with a uniform level of quantification or understanding, nor can they be characterized with uniform metrics. Given this variety in not only the nature and potential magnitude of risks and impacts, but also in our ability to characterize, quantify and project into the future such impacts, the Administrator must use her judgment to weigh the threat in each of the risk categories, weigh the potential benefits where relevant, and ultimately judge whether these risks and benefits, when viewed in total, are judged to be endangerment to public health and/or welfare.

This has a number of implications for the Administrator's approach in assessing the nature and magnitude of risk and impacts across each of the risk categories. First, the Administrator has not established a specific threshold metric for each category of risk and impacts. Also, the Administrator is not necessarily placing the greatest weight on those risks and impacts which have been the subject of the most study or quantification.

Part of the variation in risks and impacts is the fact that climbing atmospheric concentrations of greenhouse gases and associated temperature increases can bring about some potential benefits to public health and welfare in addition to adverse risks. The current understanding of any potential benefits associated with human-induced climate change is described in the TSD and is taken into consideration here. The potential for both adverse and beneficial effects are considered, as well as the relative magnitude of such effects, to the extent that the relative magnitudes can be quantified or characterized. Furthermore, given the multiple ways in which the buildup of atmospheric greenhouse gases can cause effects (*e.g.*, via elevated carbon dioxide concentrations, via temperature increases, via precipitation increases, via sea level rise, and via changes in extreme events), these multiple pathways are considered. For example, elevated carbon dioxide concentrations may be beneficial to crop yields, but changes in temperature and precipitation may be adverse and must also be considered. Likewise, modest temperature increases may have some public health benefits as well as harms, and other pathways such as changes in air quality and extreme events must also be considered.

The Administrator has balanced and weighed the varying risks and effects for each sector. She has judged whether there is a pattern across the sector that

supports or does not support an endangerment finding, and if so whether the support is of more or less weight. In cases where there is both a potential for benefits and risks of harm, the Administrator has balanced these factors by determining whether there appears to be any directional trend in the overall evidence that would support placing more weight on one than the other, taking into consideration all that is known about the likelihood of the various risks and effects and their seriousness. In all of these cases, the judgment is largely qualitative in nature, and is not reducible to precise metrics or quantification.

Regarding the timeframe for the endangerment test, it is the Administrator's view that both current and future conditions must be considered. The Administrator is thus taking the view that the endangerment period of analysis extend from the current time to the next several decades, and in some cases to the end of this century. This consideration is also consistent with the timeframes used in the underlying scientific assessments. The future timeframe under consideration is consistent with the atmospheric lifetime and climate effects of the six well-mixed greenhouse gases, and also with our ability to make reasonable and plausible projections of future conditions.

The Administrator acknowledges that some aspects of climate change science and the projected impacts are more certain than others. Our state of knowledge is strongest for recently observed, large-scale changes. Uncertainty tends to increase in characterizing changes at smaller (regional) scales relative to large (global) scales. Uncertainty also increases as the temporal scales move away from present, either backward, but more importantly forward in time. Nonetheless, the current state of knowledge of observed and past climate changes and their causes enables projections of plausible future changes under different scenarios of anthropogenic forcing for a range of spatial and temporal scales.

In some cases, where the level of sensitivity to climate of a particular sector has been extensively studied, future impacts can be quantified whereas in other instances only a qualitative description of a directional change, if that, may be possible. The inherent uncertainty in the direction, magnitude, and/or rate of certain future climate change impacts opens up the possibility that some changes could be more or less severe than expected, and the possibility of unanticipated

outcomes. In some cases, low probability, high impact outcomes (*i.e.*, known unknowns) are possibilities but cannot be explicitly assessed.

1. The Air Pollution Is Reasonably Anticipated To Endanger Public Health

The Administrator finds that the well-mixed greenhouse gas air pollution is reasonably anticipated to endanger public health, for both current and future generations. The Administrator finds that the public health of current generations is endangered and that the threat to public health for both current and future generations will likely mount over time as greenhouse gases continue to accumulate in the atmosphere and result in ever greater rates of climate change.

After review of public comments, the Administrator continues to believe that climate change can increase the risk of morbidity and mortality and that these public health impacts can and should be considered when determining endangerment to public health under CAA section 202(a). As described in Section IV.B.1 of these Findings, the Administrator is not limited to only considering whether there are any direct health effects such as respiratory or toxic effects associated with exposure to greenhouse gases.

In making this public health finding, the Administrator considered direct temperature effects, air quality effects, the potential for changes in vector-borne diseases, and the potential for changes in the severity and frequency of extreme weather events. In addition, the Administrator considered whether and how susceptible populations may be particularly at risk. The current state of science on these effects from the major assessment reports is described in greater detail in the TSD, and our responses to public comments are provided in the Response to Comments Documents.

a. Direct Temperature Effects

It has been estimated that unusually hot days and heat waves are becoming more frequent, and that unusually cold days are becoming less frequent, as noted above. Heat is already the leading cause of weather-related deaths in the United States. In the future, severe heat waves are projected to intensify in magnitude and duration over the portions of the United States where these events already occur. Heat waves are associated with marked short-term increases in mortality. Hot temperatures have also been associated with increased morbidity. The projected warming is therefore projected to increase heat related mortality and

morbidity, especially among the elderly, young and frail. The populations most sensitive to hot temperatures are older adults, the chronically sick, the very young, city-dwellers, those taking medications that disrupt thermoregulation, the mentally ill, those lacking access to air conditioning, those working or playing outdoors, and socially isolated persons. As warming increases over time, these adverse effects would be expected to increase as the serious heat events become more serious.

Increases in temperature are also expected to lead to some reduction in the risk of death related to extreme cold. Cold waves continue to pose health risks in northern latitudes in temperature regions where very low temperatures can be reached in a few hours and extend over long periods. Globally, the IPCC projects reduced human mortality from cold exposure through 2100. It is not clear whether reduced mortality in the United States from cold would be greater or less than increased heat-related mortality in the United States due to climate change. However, there is a risk that projections of cold-related deaths, and the potential for decreasing their numbers due to warmer winters, can be overestimated unless they take into account the effects of season and influenza, which is not strongly associated with monthly winter temperature. In addition, the latest USGCRP report refers to a study that analyzed daily mortality and weather data in 50 U.S. cities from 1989 to 2000 and found that, on average, cold snaps in the United States increased death rates by 1.6 percent, while heat waves triggered a 5.7 percent increase in death rates. The study concludes that increases in heat-related mortality due to global warming in the United States are unlikely to be compensated for by decreases in cold-related mortality.

b. Air Quality Effects

Increases in regional ozone pollution relative to ozone levels without climate change are expected due to higher temperatures and weaker circulation in the United States relative to air quality levels without climate change. Climate change is expected to increase regional ozone pollution, with associated risks in respiratory illnesses and premature death. In addition to human health effects, tropospheric ozone has significant adverse effects on crop yields, pasture and forest growth, and species composition. The directional effect of climate change on ambient particulate matter levels remains less certain.

Climate change can affect ozone by modifying emissions of precursors, atmospheric chemistry, and transport and removal. There is now consistent evidence from models and observations that 21st century climate change will worsen summertime surface ozone in polluted regions of North America compared to a future with no climate change.

Modeling studies discussed in EPA's Interim Assessment²⁸ show that simulated climate change causes increases in summertime ozone concentrations over substantial regions of the country, though this was not uniform, and some areas showed little change or decreases, though the decreases tend to be less pronounced than the increases. For those regions that showed climate-induced increases, the increase in maximum daily 8-hour average ozone concentration, a key metric for regulating U.S. air quality, was in the range of 2 to 8 ppb, averaged over the summer season. The increases were substantially greater than this during the peak pollution episodes that tend to occur over a number of days each summer. The overall effect of climate change was projected to increase ozone levels, compared to what would occur without this climate change, over broad areas of the country, especially on the highest ozone days and in the largest metropolitan areas with the worst ozone problems. Ozone decreases are projected to be less pronounced, and generally to be limited to some regions of the country with smaller population.

c. Effects on Extreme Weather Events

In addition to the direct effects of temperature on heat- and cold-related mortality, the Administrator considers the potential for increased deaths, injuries, infectious diseases, and stress-related disorders and other adverse effects associated with social disruption and migration from more frequent extreme weather. The Administrator notes that the vulnerability to weather disasters depends on the attributes of the people at risk (including where they live, age, income, education, and disability) and on broader social and environmental factors (level of disaster preparedness, health sector responses, and environmental degradation). The IPCC finds the following with regard to extreme events and human health:

²⁸ U.S. EPA (2009) *Assessment of the Impacts of Global Change on Regional U.S. Air Quality: A Synthesis of Climate Change Impacts on Ground-Level Ozone*. An Interim Report of the U.S. EPA Global Change Research Program. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-07/094.

Increases in the frequency of heavy precipitation events are associated with increased risk of deaths and injuries as well as infectious, respiratory, and skin diseases. Floods are low-probability, high-impact events that can overwhelm physical infrastructure, human resilience, and social organization. Flood health impacts include deaths, injuries, infectious diseases, intoxications, and mental health problems.

Increases in tropical cyclone intensity are linked to increases in the risk of deaths, injuries, waterborne and food borne diseases, as well as post-traumatic stress disorders. Drowning by storm surge, heightened by rising sea levels and more intense storms (as projected by IPCC), is the major killer in coastal storms where there are large numbers of deaths. Flooding can cause health impacts including direct injuries as well as increased incidence of waterborne diseases due to pathogens such as *Cryptosporidium* and *Giardia*.

d. Effects on Climate-Sensitive Diseases and Aeroallergens

According to the assessment literature, there will likely be an increase in the spread of several food and water-borne pathogens among susceptible populations depending on the pathogens' survival, persistence, habitat range and transmission under changing climate and environmental conditions. Food borne diseases show some relationship with temperature, and the range of some zoonotic disease carriers such as the Lyme disease carrying tick may increase with temperature.

Climate change, including changes in carbon dioxide concentrations, could impact the production, distribution, dispersion and allergenicity of aeroallergens and the growth and distribution of weeds, grasses, and trees that produce them. These changes in aeroallergens and subsequent human exposures could affect the prevalence and severity of allergy symptoms. However, the scientific literature does not provide definitive data or conclusions on how climate change might impact aeroallergens and subsequently the prevalence of allergenic illnesses in the United States.

It has generally been observed that the presence of elevated carbon dioxide concentrations and temperatures stimulate plants to increase photosynthesis, biomass, water use efficiency, and reproductive effort. The IPCC concluded that pollens are likely to increase with elevated temperature and carbon dioxide.

e. Summary of the Administrator's Finding of Endangerment to Public Health

The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public health by evaluating the risks associated with changes in air quality, increases in temperatures, changes in extreme weather events, increases in food and water borne pathogens, and changes in aeroallergens. The evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding.

The impact on mortality and morbidity associated with increases in average temperatures which increase the likelihood of heat waves also provides support for a public health endangerment finding. There are uncertainties over the net health impacts of a temperature increase due to decreases in cold-related mortality, but there is some recent evidence that suggests that the net impact on mortality is more likely to be adverse, in a context where heat is already the leading cause of weather-related deaths in the United States.

The evidence concerning how human-induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels.

There is some evidence that elevated carbon dioxide concentrations and climate changes can lead to changes in aeroallergens that could increase the potential for allergenic illnesses. The evidence on pathogen borne disease vectors provides directional support for an endangerment finding. The Administrator acknowledges the many uncertainties in these areas. Although these adverse effects, provide some support for an endangerment finding, the Administrator is not placing primary weight on these factors.

Finally, the Administrator places weight on the fact that certain groups, including children, the elderly, and the poor, are most vulnerable to these climate-related health effects.

f. Key Comments on the Finding of Endangerment to Public Health

EPA received many comments on public health issues and the proposed finding of endangerment to public health.

i. EPA's Consideration of the Climate Impacts as Public Health Issues Is Reasonable

Several commenters argue that EPA may only consider the health effects from direct exposure to pollutants in determining whether a pollutant endangers public health. The commenters state that EPA's proposal acknowledges that there is no evidence that greenhouse gases directly cause health effects, citing 74 FR 18901. To support their claim that EPA can only consider health effects that result from direct exposure to a pollutant, commenters cite several sources, discussed below.

Clean Air Act and Legislative History. Several commenters argue that the text of the CAA and the legislative history of the 1977 amendments demonstrate that Congress intended public health effects to relate to risks from direct exposure to a pollutant. They also argue that by considering health effects that result from welfare effects, EPA was essentially combining the two categories into one, contrary to the statute and Congressional intent.

Commenters state that the CAA, including CAA section 202(a)(1), requires EPA to consider endangerment of public health separately from endangerment of public welfare. Commenters note that while the CAA does not provide a definition of public health, CAA section 302(h) addresses the meaning of "welfare," which includes weather and climate. Thus, they argue, Congress has instructed that effects on weather and climate are to be considered as potentially endangering welfare—not human health. They continue that Congress surely knew that weather and climatic events such as flooding and heat waves could affect human health, but Congress nonetheless classified air pollutants' effects on weather and climate as effects on welfare.

Commenters also argue that the legislative history confirms that Congress intended for the definition of "public health" to only include the consequences of direct human exposure to ambient air pollutants. They note an

early version of section 109(b) would have required only a single NAAQS standard to protect "public health," with the protection of "welfare" being a co-benefit of the single standard. Commenters note that the proponents of this early bill explained, "[i]n many cases, a level of protection of health would take care of the welfare situation" Sen. Hearing, Subcommittee on Air and Water Pollution, Comm. On Public Works (Mar. 17, 1970) (statement of Dr. Middleton, Comm'r, Nat'l Air Pollution Control Admin., HEW), 1970 Leg. Hist. 1194. Commenters state that the Senate bill that ultimately passed rejected this combined standard, requiring separate national ambient air quality standards and national ambient air quality goals. Commenters contend that Congress intended that the national ambient air quality goals be set "to protect the public health and welfare from any known or anticipated effects associated with" air pollution, including the list of "welfare" effects currently found in CAA section 302(h), such as effects on water, vegetation, animals, wildlife, weather and climate. Commenters note the Senate Committee Report stated that the national ambient air quality *standards* were created to protect public health, while the national ambient air quality *goals* were intended to address broader issues because "the Committee also recognizes that man's natural and man-made environment must be preserved and protected. Therefore, the bill provides for the setting of national ambient air quality goals at levels necessary to protect public health and welfare from any known or anticipated adverse effects of air pollution—including effects on soils, water, vegetation, man-made materials, animals, wildlife, visibility, climate, and economic values." Commenters argue this statement is clearly the source of the current definition of welfare effects in CAA section 302(h), which also includes "personal comfort and well being." They argue the Senate bill contemplated the NAAQS would include only direct health effects, while the *goals* would encompass effects on both the public health and welfare. Commenters continue that considering both public health effects and welfare effects under a combined standard, as the Administrator attempts to do in the proposed endangerment finding, would resurrect the combined approach to NAAQS that the Senate emphatically rejected.

The commenters also cite language from the House Report in support of their view that Congress only intended that EPA consider direct health effects

when assessing endangerment to public health: "By the words 'cause or contribute to air pollution,' the committee intends to require the Administrator to consider all sources of the contaminant which contributes to air pollution and to consider all sources of exposure to the contaminant—food, water, air, etc.—in determining health risks" 7 H.R. Rep. No. 95–294, at 49–50 (1977). Commenters also cite language in the Senate Report: "Knowledge of the relationship between the exposure to many air pollution agents and acute and chronic health effects is sufficient to develop air quality criteria related to such effects" S. Rep. No. 91–1196, at 7 (1970).

The specific issue here is whether an effect on human health that results from a change in climate should be considered when EPA determines whether the air pollution of well-mixed greenhouse gases is reasonably anticipated to endanger public health. In this case, the air pollution has an effect on climate. For example the air pollution raises surface, air, and water temperatures. Among the many effects that flow from this is the expectation that there will be an increase in the risk of mortality and morbidity associated with increased intensity of heat waves. In addition, there is an expectation that there will be an increase in levels of ambient ozone, leading to increased risk of morbidity and mortality from exposure to ozone. All of these are effects on human health, and all of them are associated with the effect on climate from elevated atmospheric concentrations of greenhouse gases. None of these human health effects are associated with direct exposure to greenhouse gases.

In the past, EPA has not had to resolve the issue presented here, as it has been clear whether the effects relate to public health or relate to public welfare, with no confusion over what category was at issue. In those cases EPA has routinely looked at what effect the air pollution has on people. If the effect on people is to their health, we have considered it an issue of public health. If the effect on people is to their interest in matters other than health, we have considered it public welfare.

For example, there are serious health risks associated with inhalation of ozone, and they have logically been considered as public health issues. Ambient levels of ozone have also raised the question of indirect health benefits through screening of harmful UVB rays. EPA has also considered this indirect health effect of ozone to be a

public health issue.²⁹ Ozone pollution also affects people by impacting their interests in various vegetation through foliar damage to trees, reduced crop yield, adverse impacts on horticultural plants, and the like. EPA has consistently considered these issues when evaluating the public welfare based NAAQS standards under CAA section 109.

In all of these situations the use of the term "public" has focused EPA on how people are affected by the air pollution. If the effect on people is to their health then we have considered it a public health issue. If the effect on people is to their interest in matters other than health, then we have treated it as a public welfare issue.

The situation presented here is somewhat unique. The focus again is on the effect the air pollution has on people. Here the effect on people is to their health. However this effect flows from the change in climate and effects on climate are included in the definition of effects on welfare. That raises the issue of how to categorize the health effects—should we consider them when evaluating endangerment to public health? When we evaluate endangerment to public welfare? Or both?

The text of the CAA does not resolve this question. While Congress defined "effects on welfare," it did not define either "public health" or "public welfare". In addition, the definition of "effects on welfare" does not clearly address how to categorize health effects that flow from effects on soils, water, crops, vegetation, weather, climate, or any of the other factors listed in CAA section 302(h). It is clear that effects on climate are an effect on welfare, but the definition does not address whether health impacts that are caused by these changes in climate are also effects on welfare. The health effects at issue are not themselves effects on soils, water, crops, vegetation, weather, or climate. They are instead effects on health. They

²⁹ As discussed later, in the past EPA took the position that this kind of potential indirect beneficial impact on public health should not be considered when setting the primary health based NAAQS for ozone. This was not based on the view that it was not a potential public health impact, or that it was a public welfare impact instead of a public health impact. Instead EPA was interpreting the NAAQS standard setting provisions of section 109, and argued that they were intended to address only certain public health impacts, those that were adverse, and were not intended to address indirect, beneficial public health impacts. This interpretation of section 109 was rejected in *ATA v. EPA*, 175 F.3d 1027 (1999) *reh'g granted in part and denied in part*, 195 F.3d 4 (DC Cir. 1999). The court made it clear that the potential indirect beneficial impact of ambient ozone on public health from screening UVB rays needed to be considered when setting the NAAQS to protect public health.

derive from the effects on climate, but they are not themselves effects on climate or on anything else listed in CAA section 302(h). So the definition of effects on welfare does not address whether an effect on health, which is not itself listed in CAA section 302(h), is also an effect on welfare if it results from an effect on welfare. The text of the CAA also does not address the issue of direct and indirect health effects. Contrary to commenters' assertions, the legislative history does not address or resolve this issue.

In this context, EPA is interpreting the endangerment provision in CAA section 202(a) as meaning that the effects on peoples' health from changes to climate can and should be included in EPA's evaluation of whether the air pollution at issue endangers public health. EPA is not deciding whether these health effects also could or should be considered in evaluating endangerment to public welfare.

The stating of the issue makes the answer seem straightforward. If air pollution causes sickness or death, then these health effects should be considered when evaluating whether the air pollution endangers public health. The term public health is undefined, and by itself this is an eminently reasonable way to interpret it. This focuses on the actual effect on people, as compared to ignoring that and focusing on the pathway from the air pollution to the effect. The question then becomes whether there is a valid basis in the CAA to take the different approach suggested by commenters, an approach contrary to the common sense meaning of public health.

Notably, the term "public welfare" is undefined. While it clearly means something other than public health, there is no obvious indication whether Congress intended there to be a clear boundary between the two terms or whether there might be some overlap where some impacts could be considered both a public health and a public welfare impact. Neither the text nor the legislative history resolves this issue. Under either approach, EPA believes the proper interpretation is that these effects on health should be considered when evaluating endangerment to public health.

If we assume Congress intended that effects on public welfare could not include effects on public health and vice versa, then the effects at issue here should most reasonably be considered in the public health category. Indisputably they are health effects, and the plain meaning of the term public health would call for their inclusion in that term. The term public welfare is

undefined. If Congress intended that public welfare not include matters included in the public health category, then a reasonable interpretation of this undefined term would include those effects on welfare that impact people in ways other than impacting their health.

The definition of “effects on welfare” does not clearly address how to categorize health effects that flow from effects on water, soil, land, climate, or weather. As noted above, the definition does not address whether health impacts that are caused by these changes in climate are also “effects on welfare.” Certainly effects on health are not included in the list in CAA section 302(h). The lack of clarity in the definition of effects on welfare, combined with the lack of definition of public welfare, do not warrant interpreting the term public health differently from its straightforward and common sense meaning.

The inclusion of the phrase “effects on * * * personal comfort and well-being” as an effect on welfare supports this view. The term would logically mean something other than the different term public health. The term “well-being” is not defined, and generally has a broader and different connotation of positive physical, emotional, and mental status. The most straightforward meaning of this term, in a context where Congress used the different term public health in a wide variety of other provisions, would be to include effects on people that do not rise to the level of health effects, but otherwise impact their physical, emotional, and mental status. This gives full meaning to both terms.

The term well-being is a general term, and in isolation arguably could include health effects. However there is no textual basis to say it would include some health effects but not others, as argued by commenters. If sickness impacts your well-being, then it impacts your well-being whether it results directly or indirectly from the pollution in the air. Nothing in CAA section 302(h) limits the term well-being to indirect impacts on people, or to health effects that occur because of other welfare effects, such as climate change. It is listed as its own effect on welfare. Instead of interpreting well-being as including all health effects, or some health effects, the much more logical way to interpret this provision in the context of all of the other provisions of the CAA is to interpret it as meaning effects on people other than health effects.

Thus, if Congress intended to draw a strict line between the two categories of public health and public welfare, for

purposes of determining endangerment under CAA section 202(a), then EPA believes that its interpretation is a reasonable and straightforward way to categorize the health effects at issue here. This gives weight to the common sense meaning of the term public health, where the terms public health and public welfare are undefined and the definition of effects on welfare is at best ambiguous on this issue.

In the alternative, if Congress did not intend any such bright line between these two categories and there could be an overlap, then it is also reasonable for EPA to include these health effects in its consideration of whether the air pollution endangers public health. Neither approach condenses or conflates the two different terms. Under either approach EPA’s interpretation, as demonstrated in this rulemaking, would still consider numerous and varied effects from climate change as indisputable impacts on public welfare and not impacts on public health. In addition, this interpretation will not change the fact that in almost all cases impacts on public health would not also be considered impacts on public welfare.

Prior EPA actions. Several commenters argue that EPA’s decision to include health impacts that occur because of climate change is inconsistent with its past approach, which has been to treat indirect health effects as welfare effects. Commenters contend that in the latest Criteria Document for ozone EPA listed tropospheric ozone’s effects on UVB-induced human diseases, as well as its effects on climate change, as welfare effects, even though the agency acknowledged significant health effects such as sunburn and skin cancer. Commenters also argue that EPA listed “risks to human health” from toxins released by algal blooms due to excess nitrogen as “ecological and other welfare effects” in the recent Criteria Document for oxides of nitrogen and sulfur. Finally, commenters argue that EPA’s proposed action was contrary to the Agency decision to list new municipal solid waste landfills as a source category under CAA section 111. Commenters state that EPA listed climate change as a welfare effect in that action, (citing 56 FR 24469).

The Agency’s recent approach regarding UVB-induced health effects is consistent with the endangerment findings, and demonstrates that the Agency considers indirect effects on human health as public health issues rather than public welfare issues. While the ozone Criteria Document may have placed the discussion of UV-B related

health effects among chapters on welfare effects, in evaluating the evidence presented in the Criteria Document for purposes of preparing the policy assessment document, EPA staff clearly viewed UVB-induced effects as human health effects that were relevant in determining the public health based primary NAAQS for ozone, rather than welfare effects, regardless of which chapter in the Criteria Document described those effects. The evaluation of the UVB-related evidence is discussed with other human health effects evidence. The policy assessment document noted that Chapter 10 of the Criteria Document, “provides a thorough analysis of the current understanding of the relationship between reducing tropospheric [ozone] concentrations and the potential impact these reductions might have on UV-B surface fluxes and *indirectly contributing to increased UV-B related health effects.*” See, *Review of the National Ambient Air Quality Standards for Ozone: Policy Assessment of Scientific and Technical Information*, p 3–36 (January 2007) (emphasis added).

EPA repeated this view in the 2007 proposed ozone NAAQS rule. In presenting its evaluation of the human health evidence for purposes of setting the public health based primary NAAQS, EPA stated: “This section also summarizes the uncertainty about the *potential indirect effects on public health* associated with changes due to increases in UV-B radiation exposure, such as UV-B radiation-related skin cancers, that may be associated with reductions in ambient levels of ground-level [ozone], as discussed in chapter 10 of the Criteria Document and chapter 3 of the Staff Paper.” 72 FR 37818, 37827. See also, 72 FR 37837 (“* * * the Criteria Document also assesses the potential indirect effects related to the presence of [ozone] in the ambient air by considering the role of ground-level [ozone] in mediating human health effects that may be directly attributable to exposure to solar ultraviolet radiation (UV-B).”)

Thus, EPA’s approach to UV-B related health effects clearly shows the Agency has treated indirect health effects not as welfare effects, as commenters suggest, but as human health effects that need to be evaluated when setting the public health based primary NAAQS. In this ozone NAAQS rulemaking, EPA did not draw a line between direct and indirect health effects for purposes of evaluating UV-B related health effects and the public health based primary NAAQS.

Similarly, the NO_x/SO_x criteria document does not establish a precedent that indirect human health effects are welfare effects. Toxic algal blooms themselves are a welfare effect, so it is not surprising a discussion of algal blooms appears in sections dealing with welfare effects. The more relevant question is how EPA evaluated information regarding human health risks resulting from algal blooms. In the case of the Criteria Document, the role of nitrogen in causing algal blooms was unclear. As a result, the Agency did not have occasion to evaluate any resulting human health effects and the Criteria Document does not support the view that EPA treats indirect health effects as anything other than a public health issue.

Finally, EPA disagrees that its action here is at odds with the listing of municipal solid waste landfills under CAA section 111. In the landfills New Source Performance Standard (NSPS) EPA did not consider health effects resulting from climate change much less draw any conclusions about health effects from climate change being health or welfare effects. If anything, the landfills NSPS is consistent with EPA's approach. In the proposed rule, EPA stated: "The EPA has documented many cases of acute injury and death caused by explosions and fires related to municipal landfill gas emissions. In addition to these health effects, the associated property damage is a welfare effect" (56 FR 24474). EPA considered injury and death from fires resulting from landfill gasses to be health effects. Yet the injury did not result from direct exposure to the pollutant (landfill gas). Instead, the injury resulted from the combustion of the pollutant—the injury is essentially an indirect effect of the pollutant. Yet, as with this action, EPA considered the injury as a human health effect.

Case law. Several commenters argue that EPA's proposed endangerment finding was inconsistent with *NRDC v. EPA*, 902 F.2d 962 (DC Cir 1990). Commenters argue that in rejecting the argument that EPA must consider the health effects of increased unemployment that could result from a more stringent primary NAAQS standard, the DC Circuit explained that, "[i]t is only the health effects relating to pollutants in the air that EPA may consider." *Id.* at 973. Several commenters further argue that EPA later relied on that holding to defend its decision to set a primary NAAQS for ozone based solely on direct health effects of ozone. Citing, *EPA Pet'n for Rehearing, Am. Trucking Ass'n v. EPA*, No. 97-1440 (DC Cir. June 28, 1999)

("ATA I") (arguing that the primary NAAQS should be set through consideration of only "direct adverse effects on public health, and not indirect, allegedly beneficial effects.")

The *NRDC* case is not contrary to EPA's endangerment finding. In *NRDC*, petitioner American Iron and Steel Institute argued that EPA had to consider the costs of health consequences that might arise from increased unemployment. The court ruled that, "[c]onsideration of costs associated with alleged health risks from unemployment would be flatly inconsistent with the statute, legislative history and case law on this point." 902 F.2d at 973. The cases cited by the court in support of its decision all hold that EPA may not consider economic or technological feasibility in establishing a NAAQS. The *NRDC* decision does not establish a precedent that the CAA prohibits EPA from considering indirect health effects as a public health issue rather than a public welfare issue.

EPA also believes reliance on the Agency's petition for rehearing in noted above is misplaced. In that case, EPA did not argue that indirect beneficial health effects were not public health issues. Instead EPA argued that under the CAA, it did not have to consider such indirect beneficial health effects of an air pollutant when setting the health based primary NAAQS. EPA was interpreting the NAAQS standard setting provisions of CAA section 109, and argued that they were intended to address only certain public health impacts, those that were adverse, and were not intended to address indirect, beneficial public health impacts. The issue in the case was not whether indirect health effects are relevant for purposes of making an endangerment decision concerning public health, but rather whether EPA must consider such beneficial health effects in establishing a primary NAAQS under CAA section 109. EPA's interpretation of CAA section 109 was rejected in *ATA v. EPA*, 175 F.3d at 1027 (1999) *reh'g granted in part and denied in part*, 195 F.3d at 4 (DC Cir. 1999). The court made it clear that the potential indirect beneficial impact of ambient ozone on public health from screening UVB rays needed to be considered when setting the NAAQS to protect public health. As discussed above, EPA has done just that as noted above in the UV-B context. Moreover, as discussed in Section II of these Findings, EPA is doing that here as well (e.g., considering any benefits from reduced cold weather related deaths).

ii. EPA's Treatment and Balancing of Heat- vs. Cold-Related Public Health Risks Was Reasonable

A number of public commenters maintain that the risk of heat waves in the future will be modulated by adaptive measures. The Administrator is aware of the potential benefits of adaptation in reducing heat-related morbidity and mortality and recognizes most heat-related deaths are preventable. Nonetheless, the Administrator notes the assessment literature³⁰ indicates heat is the leading weather-related killer in the United States even though countermeasures have been employed in many vulnerable areas. Given projections for heat waves of greater frequency, magnitude, and duration coupled with a growing population of older adults (among the most vulnerable groups to this hazard), the risk of adverse health outcomes from heat waves is expected to increase. Intervention and response measures could certainly reduce the risk, but as we have noted, the need to adapt supports an increase in risk or endangerment. For a general discussion about EPA's treatment of adaptation see Section III.C of these Findings.

Several commenters also suggest cold-related mortality will decrease more than heat-related mortality will increase, which indicates a net reduction in temperature-related mortality. Some commenters point to research suggesting migration to warmer climates has contributed to the increased longevity of some Americans, implying climate warming will have benefits for health. The Administrator is very clear that the exact balance of how heat- versus cold-related mortality will change in the future is uncertain; however, the assessment literature points to evidence suggesting that the increased risk from heat would exceed the decreased risk from cold in a warming climate. The Administrator does not dispute research indicating the benefits of migration to a warmer climate and nor that average climate warming may indeed provide health benefits in some areas. These points are reflected in the TSD's statement projecting less cold-related health effects. The Administrator considers these potential warming benefits independent of the potential negative effects of extreme heat events which are projected to increase under future climate change scenarios affecting vulnerable groups and communities.

³⁰ Karl *et al.* (2009).

iii. EPA Was Reasonable To Find That the Air Quality Impacts of Climate Change Contribute to the Endangerment of Public Health

Several commenters suggest that air quality effects of climate change will be addressed through the CAA's NAAQS process, as implemented by the State Implementation Plans (SIP) and national regulatory programs. According to these commenters, these programs will ensure no adverse impact on public health due to climate change. Though climate change may cause certain air pollutant ambient concentrations to increase, States will continue to be compelled to meet the standards. So, while additional measures may be necessary, and result in increased costs, these commenters assert that, ultimately, public health will be protected by the continued existence of the NAAQS and therefore no endangerment with respect to this particular climate change-related impact will occur. One commenter states that EPA inappropriately assigns air quality risk to climate change that will be addressed through other programs. The CAA provides a mechanism to meet the standards and additional control measures consistent with the CAA will be adopted in the future, keeping pollution below unhealthy levels. The commenters state that the fact that NAAQS are in place that require EPA to fulfill its legal obligation to prevent this particular form of endangerment to public health.

EPA does have in place NAAQS for ozone, which are premised on the harmfulness of ozone to public health and welfare. These standards and their accompanying regulatory regime have helped to reduce the dangers from ozone in the United States. However, substantial challenges remain with respect to achieving the air quality protection promised by the NAAQS for ozone. It is the Administrator's view that these challenges will be exacerbated by climate change.

In addition, the control measures to achieve attainment with a NAAQS are a mitigation measure aimed at reducing emissions of ozone precursors. As discussed in Section III.C of these Findings, EPA is not considering the impacts of mitigation with respect to future reductions in emissions of greenhouse gases. For the same reasons, EPA is reasonably not considering mitigation in the form of the control measures that will need to be adopted in the future to reduce emissions of ozone precursors and thereby address the increased ambient ozone levels that can occur because of climate change.

It is important to note that controls to meet the NAAQS are typically put in place only *after* air quality concentrations exceeding the standard are detected. Furthermore, implementation of controls to reduce ambient concentrations of pollutants occurs over an extended time period, ranging from three years to more than twenty years depending on the pollutant and the seriousness of the nonattainment problem. Thus, while the CAA provides mechanisms for addressing adverse health effects and the underlying air quality exacerbation over time, it will not prevent the adverse impacts in the interim. Given the serious nature of the health effects at issue—including respiratory and cardiovascular disease leading to hospital admissions, emergency department visits, and premature mortality—this increase in adverse impacts during the time before additional controls can be implemented is a serious public health concern. Historically, a large segment of the U.S. population has lived in areas exceeding the NAAQS, despite the CAA and its implementation efforts. Half of all Americans, 158 million people, live in counties where air pollution exceeds national health standards.³¹ Where attainment of the NAAQS is especially difficult, leading to delays in meeting attainment deadlines, the health effects of increased ozone due to climate change may be substantial.

It is also important to note that it may not be possible for States and Tribes to plan accurately for the impacts of climate change in developing control strategies for nonattainment areas. As noted in the TSD and EPA's 2009 Interim Assessment report (IA), climate change is projected to lead to an increase in the variability of weather, and this may increase peak pollution events including increases in ozone exceedances. While the modeling studies in the IA all show significant future changes in meteorological quantities, there is also significant variability across the simulations in the spatial patterns of these future changes, making it difficult to select a set of future meteorological data for planning purposes. At this time, models used to develop plans to attain the NAAQS do not take potential changes in future meteorology into consideration. Inability to predict the frequency and magnitude of such events could lead to an underestimation of the controls needed to bring areas into attainment,

and a prolonged period during which adverse health impacts continue to occur.

Even in areas that meet the NAAQS currently, air quality may deteriorate sufficiently to cause adverse health effects for some individuals. Some at-risk individuals, for example those with preexisting health conditions or other characteristics which increase their risk for adverse effects upon exposure to PM or ozone, may experience health effects at levels below the standard. Current evidence suggests that there is no threshold for PM or ozone concentrations below which no effects can be observed. Therefore, increases in ozone or PM in locations that currently meet the standards would likely result in additional adverse health effects for some individuals, even though the pollution increase might not be sufficient to cause the area to be designated nonattainment. While the NAAQS is set to protect public health with an adequate margin of safety, it is recognized that in attainment areas there may be individuals who remain at greater risk from an increase in ozone levels. The clear risk to the public from ozone increases in nonattainment areas, in combination with the risk to some individuals in attainment areas, supports the finding that overall the public health is endangered by increases in ozone resulting from climate change.

Finally, it is also important to note that not all air pollution events are subject to CAA controls under the NAAQS implementation provisions. "Exceptional events" are events for which the normal planning and regulatory process established by the CAA is not appropriate (72 FR 13561). Emissions from some events, including some wildfires, are not reasonably controllable or preventable. Such emissions, however, can adversely impact public health and welfare and are expected to increase due to climate change. As described in the TSD, PM emissions from wildfires can contribute to acute and chronic illnesses of the respiratory system, particularly in children, including pneumonia, upper respiratory diseases, asthma and chronic obstructive pulmonary disease. The IPCC (Field et al., 2007) reported with very high confidence that in North America, disturbances like wildfires are increasing and are likely to intensify in a warmer future with drier soils and longer growing seasons.

2. The Air Pollution Is Reasonably Anticipated to Endanger Public Welfare

The Administrator also finds that the well-mixed greenhouse gas air pollution may reasonably be anticipated to

³¹ U.S. EPA (2008) National Air Quality: Status and Trends Through 2007. EPA-454/R-08-006, November 2008.

endanger public welfare, both for current and future generations.

As with public health, the Administrator considered the multiple pathways in which the greenhouse gas air pollution and resultant climate change affect climate-sensitive sectors, and the impact this may have on public welfare. These sectors include food production and agriculture; forestry; water resources; sea level rise and coastal areas; energy, infrastructure, and settlements; and ecosystems and wildlife. The Administrator also considered impacts on the U.S. population from climate change effects occurring outside of the United States, such as national security concerns for the United States that may arise as a result of climate change impacts in other regions of the world. The Administrator examined each climate-sensitive sector individually, informed by the summary of the scientific assessments contained in the TSD, and the full record before EPA, and weighed the extent to which the risks and impacts within each sector support or do not support a positive endangerment finding in her judgment. The Administrator then viewed the full weight of evidence looking across all sectors to reach her decision regarding endangerment to public welfare.

a. Food Production and Agriculture

Food production and agriculture within the United States is a sector that will be affected by the combined effects of elevated carbon dioxide concentrations and associated climate change. The Administrator considered how these effects, both adverse and beneficial, are affecting the agricultural sector now and in the future, and over different regions of the United States, taking into account that different regions of the country specialize in different agricultural products with varying degrees of sensitivity and vulnerability to elevated carbon dioxide levels and associated climate change.

Elevated carbon dioxide concentrations can have a stimulatory effect on grain and oilseed crop yield, as may modest temperature increases and a longer growing season that results. A report under the USGCRP concluded that, with increased carbon dioxide and temperature, the life cycle of grain and oilseed crops will likely progress more rapidly. However, such beneficial influences need to be considered in light of various other effects. For example, the literature indicates that elevated carbon dioxide concentrations may also enhance pest and weed growth. Pests and weeds can reduce crop yields, cause economic losses to

farmers, and require management control options. How climate change (elevated carbon dioxide, increased temperatures, altered precipitation patterns, and changes in the frequency and intensity of extreme events) may affect the prevalence of pests and weeds is an issue of concern for food production and the agricultural sector. Research on the combined effects of elevated carbon dioxide and climate change on pests, weeds, and disease is still limited. In addition, higher temperature increases, changing precipitation patterns and variability, and any increases in ground-level ozone induced by higher temperatures, can work to counteract any direct stimulatory carbon dioxide effect, as well as lead to their own adverse impacts. There may be large regional variability in the response of food production and agriculture to climate change.

For grain and oilseed crop yields, there is support for the view that in the near term climate change may have a beneficial effect, largely through increased temperature and increased carbon dioxide levels. However there are also factors noted above, some of which are less well studied and understood, which would tend to offset any near term benefit, leaving significant uncertainty about the actual magnitude of any overall benefit. The USGCRP report also concluded that as temperature rises, these crops will increasingly begin to experience failure, especially if climate variability increases and precipitation lessens or becomes more variable.

A key uncertainty is how human-induced climate change may affect the intensity and frequency of extreme weather events such as droughts and heavy storms. These events have the potential to have serious negative impact on U.S. food production and agriculture, but are not always taken into account in studies that examine how average conditions may change as a result of carbon dioxide and temperature increases. Changing precipitation patterns, in addition to increasing temperatures and longer growing seasons, can change the demand for irrigation requirements, potentially increasing irrigation demand.

Another key uncertainty concerns the many horticultural crops (*e.g.*, tomatoes, onions, fruits), which make up roughly 40 percent of total crop value in the United States. There is relatively little information on their response to carbon dioxide, and few crop simulation models, but according to the literature, they are very likely to be more sensitive

to the various effects of climate change than grain and oilseed crops.

With respect to livestock, higher temperatures will very likely reduce livestock production during the summer season in some areas, but these losses will very likely be partially offset by warmer temperatures during the winter season. The impact on livestock productivity due to increased variability in weather patterns will likely be far greater than effects associated with the average change in climatic conditions. Cold-water fisheries will likely be negatively affected; warm-water fisheries will generally benefit; and the results for cool-water fisheries will be mixed, with gains in the northern and losses in the southern portions of ranges.

Finally, with respect to irrigation requirements, the adverse impacts of climate change on irrigation water requirements may be significant.

There is support for the view that there may be a benefit in the near term in the crop yield for certain crops. This potential benefit is subject to significant uncertainty, however, given the offsetting impact on the yield of these crops from a variety of other climate change impacts that are less well understood and more variable. Any potential net benefit is expected to change to a disbenefit in the longer term. In addition, there is clear risk that the sensitivity of a major segment of the total crop market, the horticultural sector, may lead to adverse affects from climate change. With respect to livestock production and irrigation requirements, climate change is likely to have adverse effects in both the near and long terms. The impact on fisheries varies, and would appear to be best viewed as neutral overall.

There is a potential for a net benefit in the near term for certain crops, but there is significant uncertainty about whether this benefit will be achieved given the various potential adverse impacts of climate change on crop yield, such as the increasing risk of extreme weather events. Other aspects of this sector are expected to be adversely affected by climate change, including livestock management and irrigation requirements, and there is a risk of adverse effect on a large segment of the total crop market. For the near term, the concern over the potential for adverse effects in certain parts of the agriculture sector appears generally comparable to the potential for benefits for certain crops.

However, considering the trend over near- and long-term future conditions, the Administrator finds that the body of evidence points towards increasing risk

of net adverse impacts on U.S. food production and agriculture, with the potential for significant disruptions and crop failure in the future.

b. Forestry

The factors that the Administrator considered for the U.S. forest sector are similar to those for food production and agriculture. There is the potential for beneficial effects due to elevated concentrations of carbon dioxide and increased temperature, as well as the potential for adverse effects from increasing temperatures, changing precipitation patterns, increased insects and disease, and the potential for more frequent and severe extreme weather events. The potential beneficial effects are better understood and studied, and are limited to certain areas of the country and types of forests. The adverse effects are less certain, more variable, and also include some of the most serious adverse effects such as increased wildfire, drought, and major losses from insects and disease. As with food production and agriculture, the judgment to be made is largely a qualitative one, balancing impacts that vary in certainty and magnitude, with the end result being a judgment as to the overall direction and general level of concern.

According to the underlying science assessment reports, climate change has very likely increased the size and number of wildfires, insect outbreaks, and tree mortality in the Interior West, the Southwest, and Alaska, and will continue to do so. Rising atmospheric carbon dioxide levels will very likely increase photosynthesis for forests, but the increased photosynthesis will likely only increase wood production in young forests on fertile soils. Nitrogen deposition and warmer temperatures have very likely increased forest growth where water is not limiting and will continue to do so in the near future.

An increased frequency of disturbance (such as drought, storms, insect-outbreaks, and wildfire) is at least as important to forest ecosystem function as incremental changes in temperature, precipitation, atmospheric carbon dioxide, nitrogen deposition, and ozone pollution. Disturbances partially or completely change forest ecosystem structure and species composition, cause short-term productivity and carbon storage loss, allow better opportunities for invasive alien species to become established, and command more public and management attention and resources. The combined effects of expected increased temperature, carbon dioxide, nitrogen deposition, ozone, and forest

disturbance on soil processes and soil carbon storage remain unclear.

Precipitation and weather extremes are key to many forestry impacts, accounting for part of the regional variability in forest response. If existing trends in precipitation continue, it is expected that forest productivity will likely decrease in the Interior West, the Southwest, eastern portions of the Southeast, and Alaska, and that forest productivity will likely increase in the northeastern United States, the Lake States, and in western portions of the Southeast. An increase in drought events will very likely reduce forest productivity wherever such events occur.

Changes in disturbance patterns are expected to have a substantial impact on overall gains or losses. More prevalent wildfire disturbances have recently been observed in the United States. Wildfires and droughts, among other extreme events (e.g., hurricanes) that can cause forest damage, pose the largest threats over time to forest ecosystems.

For the near term, the Administrator believes the beneficial impact on forest growth and productivity in certain parts of the country from climate change to be more than offset by the clear risk from the more significant and serious adverse effects from the observed increases in wildfires, combined with the adverse impacts on growth and productivity in other areas of the country and the serious risks from the spread of destructive pests and disease. Increased wildfires can also increase particulate matter and thus create public health concerns as well. For the longer term, the Administrator views the risk from adverse effects to increase over time, such that overall climate change presents serious adverse risks for forest productivity. The Administrator therefore finds there is compelling reason to find that the greenhouse gas air pollution endangers U.S. forestry in both the near and long term, with the support for a positive endangerment finding only increasing as one considers expected future conditions in which temperatures continue to rise.

c. Water Resources

The sensitivity of water resources to climate change is very important given the increasing demand for adequate water supplies and services for agricultural, municipal, and energy and industrial uses, and the current strains on this resource in many parts of the country.

According to the assessment literature, climate change has already altered, and will likely continue to alter, the water cycle, affecting where, when,

and how much water is available for all uses. With higher temperatures, the water-holding capacity of the atmosphere and evaporation into the atmosphere increase, and this favors increased climate variability, with more intense precipitation and more droughts.

Climate change is causing and will increasingly cause shrinking snowpack induced by increasing temperature. In the western United States, there is already well-documented evidence of shrinking snowpack due to warming. Earlier meltings, with increased runoff in the winter and early spring, increase flood concerns and also result in substantially decreased summer flows. This pattern of reduced snowpack and changes to the flow regime pose very serious risks to major population regions, such as California, that rely on snowmelt-dominated watersheds for their water supply. While increased precipitation is expected to increase water flow levels in some eastern areas, this may be tempered by increased variability in the precipitation and the accompanying increased risk of floods and other concerns such as water pollution.

Warmer temperatures and decreasing precipitation in other parts of the country, such as the Southwest, can sustain and amplify drought impacts. Although drought has been more frequent and intense in the western part of the United States, the East is also vulnerable to droughts and attendant reductions in water supply, changes in water quality and ecosystem function, and challenges in allocation. The stress on water supplies on islands is expected to increase.

The impact of climate change on groundwater as a water supply is regionally variable; efforts to offset declining surface water availability due to increasing precipitation variability may be hampered by the fact that groundwater recharge will decrease considerably in some already water-stressed regions. In coastal areas, the increased salinization from intrusion of salt water is projected to have negative effects on the supply of fresh water.

Climate change is expected to have adverse effects on water quality. The IPCC concluded with high confidence that higher water temperatures, increased precipitation intensity, and longer periods of low flows exacerbate many forms of water pollution and can impact ecosystems, human health, and water system reliability and operating costs. These changes will also exacerbate many forms of water pollution, potentially making attainment of water quality goals more

difficult. Water pollutants of concern that are particularly relevant to climate change effects include sediment, nutrients, organic matter, pathogens, pesticides, salt, and thermal pollution. As waters become warmer, the aquatic life they now support will be replaced by other species better adapted to warmer water. In the long term, warmer water, changing flows, and decreased water quality may result in deterioration of aquatic ecosystems.

Climate change will likely further constrain already over-allocated water resources in some regions of the United States, increasing competition among agricultural, municipal, industrial, and ecological uses. Although water management practices in the United States are generally advanced, particularly in the West, the reliance on past conditions as the basis for current and future planning may no longer be appropriate, as climate change increasingly creates conditions well outside of historical observations. Increased incidence of extreme weather and floods may also overwhelm or damage water treatment and management systems, resulting in water quality impairments. In the Great Lakes and major river systems, lower water levels are likely to exacerbate challenges relating to water quality, navigation, recreation, hydropower generation, water transfers, and bi-national relationships.

The Administrator finds that the total scientific literature provides compelling support for finding that greenhouse gas air pollution endangers the water resources important for public welfare in the United States, both for current and future generations. The adequacy of water supplies across large areas of the country is at serious risk from climate change. Even areas of the country where an increase in water flow is projected could face water resource problems from the variability of the supply and water quality problems associated with precipitation variability, and could face the serious adverse effects from risks from floods and drought. Climate change is expected to adversely affect water quality. There is an increased risk of serious adverse effects from extreme events of flooding and drought. The severity of risks and impacts may only increase over time with accumulating greenhouse gas concentrations and associated temperature increases and precipitation changes.

d. Sea Level Rise and Coastal Areas

A large percentage of the U.S. population lives in coastal areas, which are particularly vulnerable to the risks posed by climate change. The most

vulnerable areas are the Atlantic and Gulf Coasts, the Pacific Islands, and parts of Alaska.

According to the assessment literature, sea level is rising along much of the U.S. coast, and the rate of change will very likely increase in the future, exacerbating the impacts of progressive inundation, storm-surge flooding, and shoreline erosion. Cities such as New Orleans, Miami, and New York are particularly at risk, and could have difficulty coping with the sea level rise projected by the end of the century under a higher emissions scenario. Population growth and the rising value of infrastructure increases the vulnerability to climate variability and future climate change in coastal areas. Adverse impacts on islands present concerns for Hawaii and the U.S. territories. Reductions in Arctic sea ice increases extreme coastal erosion in Alaska, due to the increased exposure of the coastline to strong wave action. In the Great Lakes, where sea level rise is not a concern, both extremely high and low water levels resulting from changes to the hydrological cycle have been damaging and disruptive to shoreline communities.

Coastal wetland loss is being observed in the United States where these ecosystems are squeezed between natural and artificial landward boundaries and rising sea levels. Up to 21 percent of the remaining coastal wetlands in the U.S. mid-Atlantic region are potentially at risk of inundation between 2000 and 2100. Coastal habitats will likely be increasingly stressed by climate change impacts interacting with development and pollution.

Although increases in mean sea level over the 21st century and beyond will inundate unprotected, low-lying areas, the most devastating impacts are likely to be associated with storm surge. Superimposed on expected rates of sea level rise, projected storm intensity, wave height, and storm surge suggest more severe coastal flooding and erosion hazards. Higher sea level provides an elevated base for storm surges to build upon and diminishes the rate at which low-lying areas drain, thereby increasing the risk of flooding from rainstorms. In New York City and Long Island, flooding from a combination of sea level rise and storm surge could be several meters deep. Projections suggest that the return period of a 100-year flood event in this area might be reduced to 19–68 years, on average, by the 2050s, and to 4–60 years by the 2080s. Additionally, some major urban centers in the United States, such as areas of New Orleans are situated in low-lying flood plains,

presenting increased risk from storm surges.

The Administrator finds that the most serious risk of adverse effects is presented by the increased risk of storm surge and flooding in coastal areas from sea level rise. Current observations of sea level rise are now contributing to increased risk of storm surge and flooding in coastal areas, and there is reason to find that these areas are now endangered by human-induced climate change. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense with increasing temperatures (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. The Administrator has concluded that even if there is a low probability of raising the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution.

In addition, coastal areas face other adverse impacts from sea level rise such as shoreline retreat, erosion, wetland loss and other effects. The increased risk associated with these adverse impacts also endangers the welfare of current and future generations, with an increasing risk of greater adverse impacts in the future.

Overall, the evidence on risk of adverse impacts for coastal areas from sea level rise provides clear support for finding that greenhouse gas air pollution endangers the welfare of current and future generations.

e. Energy, Infrastructure and Settlements

The Administrator also considered the impacts of climate change on energy consumption and production, and on key climate-sensitive aspects of the nation's infrastructure and settlements.

For the energy sector, the Administrator finds clear evidence that temperature increases will change heating and cooling demand, and to varying degrees across the country; however, under current conditions it is unclear whether or not net demand will increase or decrease. While the impacts on net energy demand may be viewed as generally neutral for purposes of making an endangerment determination, climate change is expected to call for an increase in electricity production, especially supply for peak demand. The U.S. energy sector, which relies heavily on water for cooling capacity and

hydropower, may be adversely impacted by changes to water supply in reservoirs and other water bodies.

With respect to infrastructure, climate change vulnerabilities of industry, settlement and society are mainly related to extreme weather events rather than to gradual climate change. The significance of gradual climate change, *e.g.*, increases in the mean temperature, lies mainly in changes in the intensity and frequency of extreme events. Extreme weather events could threaten U.S. energy infrastructure (transmission and distribution), transportation infrastructure (roads, bridges, airports and seaports), water infrastructure, and other built aspects of human settlements. Moreover, soil subsidence caused by the melting of permafrost in the Arctic region is a risk to gas and oil pipelines, electrical transmission towers, roads, and water systems. Vulnerabilities for industry, infrastructures, settlements, and society to climate change are generally greater in certain high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Additionally, infrastructures are often connected, meaning that an impact on one can also affect others.

A significant fraction of U.S. infrastructure is located in coastal areas. In these locations, rising sea levels are likely to lead to direct losses (*e.g.*, equipment damage from flooding) as well as indirect effects such as the costs associated with raising vulnerable assets to higher levels. Water infrastructure, including drinking water and wastewater treatment plants, and sewer and storm water management systems, may be at greater risk of flooding, sea level rise and storm surge, low flows, saltwater intrusion, and other factors that could impair performance and damage costly investments.

Within settlements experiencing climate change stressors, certain parts of the population may be especially vulnerable based on their circumstances. These include the poor, the elderly, the very young, those already in poor health, the disabled, those living alone, and/or indigenous populations dependent on one or a few resources. In Alaska, indigenous communities are likely to experience disruptive impacts, including shifts in the range or abundance of wild species crucial to their livelihoods and well-being.

Overall, the evidence strongly supports the view that climate change presents risks of serious adverse impacts on public welfare from the risk to energy production and distribution as

well as risks to infrastructure and settlements.

f. Ecosystems and Wildlife

The Administrator considered the impacts of climate change on ecosystems and wildlife and the services they provide. The Administrator finds clear evidence that climate change is exerting major influences on natural environments and biodiversity, and these influences are generally expected to grow with increased warming. Observed changes in the life cycles of plants and animals include shifts in habitat ranges, timing of migration patterns, and changes in reproductive timing and behavior.

The underlying assessment literature finds with high confidence that substantial changes in the structure and functioning of terrestrial ecosystems are very likely to occur with a global warming greater than 2 to 3 °C above pre-industrial levels, with predominantly negative consequences for biodiversity and the provisioning of ecosystem goods and services. With global average temperature changes above 2 °C, many terrestrial, freshwater, and marine species (particularly endemic species) are at a far greater risk of extinction than in the geological past. Climate change and ocean acidification will likely impair a wide range of planktonic and other marine calcifiers such as corals. Even without ocean acidification effects, increases in sea surface temperature of about 1–3 °C are projected to result in more frequent coral bleaching events and widespread mortality. In the Arctic, wildlife faces great challenges from the effects of climatic warming, as projected reductions in sea ice will drastically shrink marine habitat for polar bears, ice-inhabiting seals, and other animals.

Some common forest types are projected to expand, such as oak-hickory, while others are projected to contract, such as maple-beech-birch. Still others, such as spruce-fir, are likely to disappear from the contiguous United States. Changes in plant species composition in response to climate change can increase ecosystem vulnerability to other disturbances, including wildfires and biological invasion. Disturbances such as wildfires and insect outbreaks are increasing in the United States and are likely to intensify in a warmer future with warmer winters, drier soils and longer growing seasons. The areal extent of drought-limited ecosystems is projected to increase 11 percent per °C warming in the United States. In California, temperature increases greater than 2 °C may lead to conversion of shrubland

into desert and grassland ecosystems and evergreen conifer forests into mixed deciduous forests. Greater intensity of extreme events may alter disturbance regimes in coastal ecosystems leading to changes in diversity and ecosystem functioning. Species inhabiting salt marshes, mangroves, and coral reefs are likely to be particularly vulnerable to these effects.

The Administrator finds that the total scientific record provides compelling support for finding that the greenhouse gas air pollution leads to predominantly negative consequences for biodiversity and the provisioning of ecosystem goods and services for ecosystems and wildlife important for public welfare in the U.S., both for current and future generations. The severity of risks and impacts may only increase over time with accumulating greenhouse gas concentrations and associated temperature increases and precipitation changes.

g. Summary of the Administrator's Finding of Endangerment to Public Welfare

The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public welfare by evaluating numerous and far-ranging risks to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy, infrastructure, and settlements, and ecosystems and wildlife. For each of these sectors, the evidence provides support for a finding of endangerment to public welfare. The evidence concerning adverse impacts in the areas of water resources and sea level rise and coastal areas provide the clearest and strongest support for an endangerment finding, both for current and future generations. Strong support is also found in the evidence concerning infrastructure and settlements, as well ecosystems and wildlife. Across the sectors, the potential serious adverse impacts of extreme events, such as wildfires, flooding, drought, and extreme weather conditions provide strong support for such a finding.

Water resources across large areas of the country are at serious risk from climate change, with effects on water supplies, water quality, and adverse effects from extreme events such as floods and droughts. Even areas of the country where an increase in water flow is projected could face water resource problems from the supply and water quality problems associated with temperature increases and precipitation variability, and could face the increased risk of serious adverse effects from extreme events, such as floods and

drought. The severity of risks and impacts is likely to increase over time with accumulating greenhouse gas concentrations and associated temperature increases and precipitation changes.

Overall, the evidence on risk of adverse impacts for coastal areas provides clear support for a finding that greenhouse gas air pollution endangers the welfare of current and future generations. The most serious potential adverse effects are the increased risk of storm surge and flooding in coastal areas from sea level rise and more intense storms. Observed sea level rise is already increasing the risk of storm surge and flooding in some coastal areas. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. Even if there is a low probability of increasing the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution. In addition, coastal areas face other adverse impacts from sea level rise such as land loss due to inundation, erosion, wetland submergence, and habitat loss. The increased risk associated with these adverse impacts also endangers public welfare, with an increasing risk of greater adverse impacts in the future.

Strong support for an endangerment finding is also found in the evidence concerning energy, infrastructure, and settlements, as well ecosystems and wildlife. While the impacts on net energy demand may be viewed as generally neutral for purposes of making an endangerment determination, climate change is expected to result in an increase in electricity production, especially to meet peak demand. This increase may be exacerbated by the potential for adverse impacts from climate change on hydropower resources as well as the potential risk of serious adverse effects on energy infrastructure from extreme events. Changes in extreme weather events threaten energy, transportation, and water resource infrastructure. Vulnerabilities of industry, infrastructure, and settlements to climate change are generally greater in high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Climate

change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental and cultural impacts on their historic lifestyles. Over the 21st century, changes in climate will cause some species to shift north and to higher elevations and fundamentally rearrange U.S. ecosystems. Differential capacities for range shifts and constraints from development, habitat fragmentation, invasive species, and broken ecological connections will likely alter ecosystem structure, function, and services, leading to predominantly negative consequences for biodiversity and the provision of ecosystem goods and services.

With respect to food production and agriculture, there is a potential for a net benefit in the near term for certain crops, but there is significant uncertainty about whether this benefit will be achieved given the various potential adverse impacts of climate change on crop yield, such as the increasing risk of extreme weather events. Other aspects of this sector may be adversely affected by climate change, including livestock management and irrigation requirements, and there is a risk of adverse effect on a large segment of the total crop market. For the near term, the concern over the potential for adverse effects in certain parts of the agriculture sector appears generally comparable to the potential for benefits for certain crops. However, the body of evidence points towards increasing risk of net adverse impacts on U.S. food production and agriculture over time, with the potential for significant disruptions and crop failure in the future.

For the near term, the Administrator finds the beneficial impact on forest growth and productivity in certain parts of the country from elevated carbon dioxide concentrations and temperature increases to date is offset by the clear risk from the observed increases in wildfires, combined with risks from the spread of destructive pests and disease. For the longer term, the risk from adverse effects increases over time, such that overall climate change presents serious adverse risks for forest productivity. There is compelling reason to find that the support for a positive endangerment finding increases as one considers expected future conditions where temperatures continue to rise.

Looking across all of the sectors discussed above, the evidence provides compelling support for finding that

greenhouse gas air pollution endangers the public welfare of both current and future generations. The risk and the severity of adverse impacts on public welfare are expected to increase over time.

h. Impacts in Other World Regions That Can Affect the U.S Population

While the finding of endangerment to public health and welfare discussed above is based on impacts in the United States, the Administrator also considered how human-induced climate change in other regions of the world may in turn affect public welfare in the United States. According to the USGCRP report of June 2009 and other sources, climate change impacts in certain regions of the world may exacerbate problems that raise humanitarian, trade, and national security issues for the United States.³² The IPCC identifies the most vulnerable world regions as the Arctic, because of the effects of high rates of projected warming on natural systems; Africa, especially the sub-Saharan region, because of current low adaptive capacity as well as climate change; small islands, due to high exposure of population and infrastructure to risk of sea-level rise and increased storm surge; and Asian mega-deltas, such as the Ganges-Brahmaputra and the Zhujiang, due to large populations and high exposure to sea level rise, storm surge, and river flooding. Climate change has been described as a potential threat multiplier with regard to national security issues.

The Administrator acknowledges these kinds of risks do not readily lend themselves to precise analyses or future projections. However, given the unavoidable global nature of the climate change problem, it is appropriate and prudent to consider how impacts in other world regions may present risks to the U.S. population. Because human-induced climate change has the potential to aggravate natural resource, trade, and humanitarian issues in other world regions, which in turn may contribute to the endangerment of public welfare in the United States, this provides additional support for the Administrator's finding that the greenhouse gas air pollution is reasonably anticipated to endanger the public welfare of current and future

³² "In an increasingly interdependent world, U.S. vulnerability to climate change is linked to the fates of other nations. For example, conflicts or mass migrations of people resulting from food scarcity and other resource limits, health impacts or environmental stresses in other parts of the world could threaten U.S. national security." (Karl *et al.*, 2009).

generations of the United States population.

i. Summary of Key Public Comments on Endangerment to Public Welfare

Several public commenters point out the anticipated benefits that increasing carbon dioxide levels and temperatures will have on agricultural crops. In addition, commenters note how U.S. agricultural productivity, in particular, has been steadily rising over the last 100 years. Responses to major comments are found here and more detailed responses are found in the Response to Comments document.

The Administrator acknowledges that plants including agricultural crops respond to carbon dioxide positively based on numerous well-documented studies. However, previous assessments of food production and agriculture have been modified to highlight increasing vulnerability, stress, and adverse impacts from climate change over time, based on improvements in the understanding of plant physiology, concern over impacts on plant pests and pathogens, and the implications of changes in average temperatures for temperature extremes and for changes in the patterns of precipitation and evaporation. While it is still the case today and for the next few years that climate change benefits agriculture in some places and harms them in others, the Administrator considers that the far larger temperature increases expected over coming decades and beyond on the "business as usual" trajectory will put significant stresses on agriculture and land resources in all regions of the United States. The Administrator prudently considers increased climate variability associated with a warming climate, which may overwhelm the positive plant responses from elevated carbon dioxide over time. Further, the effects of climate change on weeds, insect pests, and pathogens are recognized as key factors in determining plant damage in future decades. The Administrator also notes that scientific literature clearly supports the finding that drought frequency and severity are projected to increase in the future over much of the United States, which will likely reduce crop yields because of excesses or deficits of water. Vulnerability to extended drought, according to IPCC, has been documented as already increasing across North America. Further, based on review of the assessment literature, the Administrator considers multiple stresses, such as limited availability of water resources, loss of biodiversity, and air pollution, which are likely to increase sensitivity and reduce

resilience in the agricultural sector to climate change over time.

Similar to food production and agriculture, public commenters often noted that forest productivity is projected to increase in the coming years due to the direct stimulatory effect of carbon dioxide on plant growth combined with warmer temperatures and thus extended growing seasons. The Administrator notes this phenomenon has been well documented by numerous studies but recognizes that increased productivity will be associated with significant variation at local and regional scales. The Administrator considers that climate strongly influences forest productivity and composition, and the frequency and magnitude of disturbances that impact forests. Based on the most recent IPCC assessment of the scientific literature, several recent studies confirm previous findings that temperature and precipitation changes in future decades will modify, and often limit, direct carbon dioxide effects on plants. For example, increased temperatures may reduce carbon dioxide effects indirectly, by increasing water demand. The Administrator also considers that new research more firmly establishes the negative impacts of increased climate variability. Projected changes in the frequency and severity of extreme climate events have significant consequences for forestry production and amplify existing stresses to land resources in the future.

Several public commenters maintain that wildfires are primarily the result of natural climatic factors and not climate change and dispute that they are or will increase in the future. The Administrator notes the scientific literature and assessment reports provide several lines of evidence that suggest wildfires will likely increase in frequency over the next several decades because of climate warming. Wildfires and droughts, among other extreme events (e.g., hurricanes) that cause forest damage, pose the largest threats over time to forest ecosystems. The assessment literature suggests that large, stand-replacing wildfires will likely increase in frequency over the next several decades because of climate warming and general climate warming encourages wildfires by extending the summer period that dries fuels, promoting easier ignition and faster spread. Furthermore, current climate modeling studies suggest that increased temperatures and longer growing seasons will elevate wildfire risk in connection with increased aridity.

V. The Administrator's Finding That Emissions of Greenhouse Gases From CAA Section 202(a) Sources Cause or Contribute to the Endangerment of Public Health and Welfare

As discussed in Section IV.A of these Findings, the Administrator is defining the air pollution for purposes of the endangerment finding to be the elevated concentration of well-mixed greenhouse gases in the atmosphere. The second step of the two-part endangerment test is for the Administrator to determine whether the emission of any air pollutant emitted from new motor vehicles cause or contribute to this air pollution. This is referred to as the cause or contribute finding, and is the second finding by the Administrator in this action.

Section V.A of these Findings describes the Administrator's definition and scope of the air pollutant "well-mixed greenhouse gases." Section V.B of these Findings puts forth the Administrator's finding that emissions of well-mixed greenhouse gases from new motor vehicles contribute to the air pollution which is reasonably anticipated to endanger public health and welfare. Section V.C of these Findings provides responses to some of the key comments on these issues. See Response to Comments document Volume 10 for responses to other significant comments on the cause or contribute finding. More detailed emissions data summarized in the discussion below can be found in Appendix B of the TSD.

A. The Administrator's Definition of the "Air Pollutant"

As discussed in the Proposed Findings, to help appreciate the distinction between air pollution and air pollutant, the *air pollution* can be thought of as the total, cumulative stock in the atmosphere, while the *air pollutant*, can be thought of as the flow that changes the size of the total stock. Given this relationship, it is not surprising that the Administrator is defining the air pollutant similar to the air pollution; while the air pollution is the concentration (e.g., stock) of the well-mixed greenhouse gases in the atmosphere, the air pollutant is the same combined grouping of the well-mixed greenhouse gases, the emissions of which are analyzed for contribution (e.g., the flow into the stock).

Thus, the Administrator is defining the air pollutant as the aggregate group of the same six long-lived and directly-emitted greenhouse gases: Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons,

and sulfur hexafluoride. As noted above, this definition of a single air pollutant made up of these well-mixed greenhouse gases is similar to definitions of other air pollutants that are comprised of substances that share common attributes with similar effects on public health or welfare (e.g., particulate matter and volatile organic compounds).

The common attributes shared by these six greenhouse gases are discussed in detail in Section IV.A of these Findings, where the Administrator defined the “air pollution” for purposes of the endangerment finding. These same common attributes support the Administrator grouping these six greenhouse gases for purposes of defining a single air pollutant as well. These attributes include the fact that they are all greenhouse gases that are directly emitted (i.e., they are not formed through secondary processes in the atmosphere from precursor emissions); they are sufficiently long-lived in the atmosphere such that, once emitted, concentrations of each gas become well mixed throughout the entire global atmosphere; and they exert a climate warming effect by trapping outgoing, infrared heat that would otherwise escape to space. Moreover, the radiative forcing effect of these six greenhouse gases is well understood.

Furthermore, these six greenhouse gases are currently the common focus of climate science and policy. For example, the UNFCCC, signed and ratified by the U.S. in 1992, requires its signatories to “develop, periodically update, publish and make available * * * national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol³³, using comparable methodologies * * *.”³⁴ To date, the focus of UNFCCC actions and discussions has been on the six greenhouse gases that are the same focus of these findings. As a Party to the UNFCCC, EPA annually submits the *Inventory of U.S. Greenhouse Gas Emissions and Sinks* to the Convention, which reports on national emissions of anthropogenic emissions of the well-mixed greenhouse gases. International discussions about a post-Kyoto agreement also focus on the well-mixed greenhouse gases.

³³ The Montreal Protocol covers ozone-depleting substances which may also share physical attributes of the six key greenhouse gases in this action, but they do not share other attributes such as being the focus of climate science and policy. See section * * *.

³⁴ UNFCCC Art. 4.1(b).

As noted above, grouping of many substances with common attributes as a single pollutant is common practice under the CAA. Thus, doing so here is not novel. Indeed CAA section 302(g) defines air pollutant as “any air pollutant agent or combination of such agents, * * *” CAA § 302(g) (emphasis added). Thus, it is clear that the term “air pollutant” is not limited to individual chemical compounds. In determining that greenhouse gases are within the scope of this definition, the Supreme Court described section 302(g) as a “sweeping” and “capacious” definition that unambiguously included greenhouse gases, that are “unquestionably ‘agents’ of air pollution.” *Massachusetts v. EPA*, 549 U.S. at 528, 532, 529 n.26. Although the Court did not interpret the term “combination of” air pollution agents, there is no reason this phrase would be interpreted any less broadly. Congress used the term “any”, and did not qualify the kind of combinations that the agency could define as a single air pollutant. Congress provided EPA broad discretion to determine appropriate combinations of compounds that should be treated as a single air pollutant.³⁵

For the same reasons discussed in Section IV.A above, at this time, only carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride share all of these common attributes and thus they are the only substances that the Administrator finds to meet the definition of “well-mixed greenhouse gas” at this time.³⁶ Also as noted above, if in the future other substances are shown to meet the same criteria they may be added to the definition of this single air pollutant.

The Administrator is aware that CAA section 202(a) source categories do not emit all of the substances meeting the definition of well-mixed greenhouse gases. But that does not change the fact that all of these greenhouse gases share the attributes that make grouping them as a single air pollutant reasonable. As discussed further below, the reasonableness of this grouping does not turn on the particular source category

³⁵ Indeed, the greenhouse gases hydrofluorocarbons and perfluorocarbons each are already a combination of multiple compounds.

³⁶ The term “well-mixed greenhouse gases” is based on one of the shared attributes discussed above—these greenhouse gases are sufficiently long-lived in the atmosphere such that, once emitted, concentrations of each gas become well mixed throughout the entire global atmosphere. Defining the air pollutant to be the combination of these six well-mixed greenhouse gases is based in part on this attribute—after the gases are emitted, they are sufficiently long-lived in the atmosphere to become well mixed as part of the air pollution.

being evaluated in a contribution finding.

B. The Administrator’s Finding Regarding Whether Emissions of the Air Pollutant From Section 202(a) Source Categories Cause or Contribute to the Air Pollution That May Be Reasonably Anticipated To Endanger Public Health and Welfare

The Administrator finds that emissions of the well-mixed greenhouse gases from new motor vehicles contribute to the air pollution that may reasonably be anticipated to endanger public health and welfare. This contribution finding is for all of the CAA section 202(a) source categories and the Administrator considered emissions from all of these source categories. The relevant mobile sources under CAA section 202 (a)(1) are “any class or classes of new motor vehicles or new motor vehicle engines, * * *.” CAA section 202(a)(1) (emphasis added). The new motor vehicles and new motor vehicle engines (hereinafter “CAA section 202(a) source categories”) addressed are: Passenger cars, light-duty trucks, motorcycles, buses, and medium and heavy-duty trucks. Detailed combined greenhouse gas emissions data for CAA section 202(a) source categories are presented in Appendix B of the TSD.³⁷

The Administrator reached her decision after reviewing emissions data on the contribution of CAA section 202(a) source categories relative to both global greenhouse gas emissions and U.S. greenhouse gas emissions. Given that CAA section 202(a) source categories are responsible for about 4 percent of total global greenhouse gas emissions, and for just over 23 percent of total U.S. greenhouse gas emissions, the Administrator finds that both of these comparisons, independently and together, support a finding that CAA section 202(a) source categories contribute to the air pollution that may be reasonably anticipated to endanger public health and welfare. The Administrator is not placing primary weight on either approach; rather she finds that both approaches clearly establish that emissions of the well-mixed greenhouse gases from section 202(a) source categories contribute to air pollution with may reasonably be anticipated to endanger public health and welfare. As the Supreme Court noted, “[j]udged by any standard, U.S.

³⁷ For section 202(a) source categories, only the hydrofluorocarbon emissions related to passenger compartment cooling are included. Emissions from refrigeration units that may be attached to trucks are considered emissions from nonroad engines under CAA section 213.

motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence, * * * to global warming.” *Massachusetts v. EPA*, 549 U.S. at 525.³⁸

1. Administrator's Approach in Making This Finding

Section 202(a) of the CAA source categories consist of passenger cars, light-duty trucks, motorcycles, buses, and heavy- and medium-duty trucks. As noted in the Proposed Findings, in the past the requisite contribution findings have been proposed concurrently with proposing emission standards for the relevant mobile source category. Thus, prior contribution findings often focused on a subset of the CAA section 202(a) (or other section) source categories. This final cause or contribute finding, however, is for all of the CAA section 202(a) source categories. The Administrator is considering emissions from all of these source categories in the determination.

Section 202(a) source categories emit the following well-mixed greenhouse gases: carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons. As the basis for the Administrator's determination, EPA analyzed historical data of emissions of the well-mixed greenhouse gases for motor vehicles and motor vehicle engines in the United States from 1990 to 2007.

The Proposed Findings discussed a number of possible ways of assessing cause or contribute and the point was made that no single approach is required by the statute or has been used exclusively in previous determinations under the CAA. The Administrator also discussed how, consistent with prior cause or contribute findings and the science, she is using emissions as a proxy for contributions to atmospheric concentrations. This approach is reasonable for the well-mixed greenhouse gases, because cumulative emissions are responsible for the cumulative change in the concentrations in the atmosphere. Similarly, annual emissions are a perfectly reasonable proxy for annual incremental changes in atmospheric concentrations.

In making a judgment about the contribution of emissions from CAA section 202(a) source categories, the Administrator focused on making a reasoned overall comparison of emissions from the CAA section 202(a) source categories to emissions from

other sources of greenhouse gases. This allows a determination of how the CAA section 202(a) source categories compare to all of the other sources that together as a group make up the total emissions contributors to the air pollution problem. The relative importance of the CAA section 202(a) source categories is central to making the contribution determination. Both the magnitude of these emissions and the comparison of these emissions to other sources provide the basis to determine whether the CAA section 202(a) source categories may reasonably be judged as contributing to the air pollution problem.

In many cases EPA makes this kind of comparison of source categories by a simple percentage calculation that compares the emissions from the source category at issue to a larger total group of emissions. Depending on the circumstances, a larger percentage often means a greater relative impact from that source category compared to the other sources that make up the total of emissions, and vice versa. However, the actual numerical percentages may have little meaning when viewed in isolation. The context of the comparison is needed to ensure the information is useful in evaluating the relative impact of one source compared to others. For example, the number of sources involved and the distribution of emissions across all of the sources can make a significant difference when evaluating the results of a percentage calculation. In some cases a certain percentage might mean almost all other sources are larger or much larger than the source at issue, while in other circumstances the same percentage could mean that the source at issue is in fact one of the larger contributors to the total.

The Administrator therefore considered the totality of the circumstances in order to best understand the role played by CAA section 202(a) source categories. This is consistent with Congress' intention for EPA to consider the cumulative impact of all sources of pollution. In that context, the global nature of the air pollution problem and the breadth of countries and sources emitting greenhouse gases means that no single country and no single source category dominate or are even close to dominating on a global scale. For example, the United States as a country is the second largest emitter of greenhouse gases, and emits approximately 18 percent of the world's total greenhouse gases. The total emissions of greenhouse gases worldwide are from numerous sources and countries, with each country and

each source category contributing a relatively small percentage of the total emissions. That means that the relative ranking of countries or sources is not at all obvious from the magnitude of the percentage by itself. A country or a source may be a large contributor, in comparison to other countries or sources, even though its percentage contribution may appear relatively small.

In this situation, addressing a global air pollution problem may call for many different sources and countries to address emissions even if none by itself dominates or comes close to dominating the global inventory. A somewhat analogous situation can be found in the ozone air pollution problem in the United States. Emissions of NO_x and volatile organic compounds (VOCs) often come from numerous small sources, as well as certain large source categories. We have learned that successful ozone control strategies often need to take this into account, and address both the larger sources of NO_x and VOCs as well as the many smaller sources, given the breadth of sources that as a group lead to the total inventory of VOCs and NO_x.

The global aspects of the greenhouse gas air pollution problem amplify this kind of situation many times over, where no single country or source category dominates or comes close to dominating the global inventory of greenhouse gas emissions. These unique, global aspects of the climate change problem tend to support consideration of contribution at lower percentage levels of emissions than might otherwise be considered appropriate when addressing a more typical local or regional air pollution problem. In this situation it is quite reasonable to consider emissions from source categories that are more important in relation to other sources, even if their absolute contribution initially may appear to be small.

In addition, the Administrator is aware of the fact that the United States is the second largest emitter of well-mixed greenhouse gases in the world. As the United States evaluates how to address climate change, the Administrator will analyze the various sources of emissions and the source's share of U.S. emissions. Thus, when analyzing whether a source category that emits well-mixed greenhouse gases in the United States contributes to the global problem, it is appropriate for the Administrator to consider how that source category fits into the larger picture of U.S. emissions. This ranking process within the United States allows the importance of the source category to

³⁸ Because the Administrator is defining the air pollutant as the combination of well-mixed greenhouse gases, she is not issuing a final contribution finding based on the alternative definition discussed in the proposed findings (e.g., each greenhouse gas as an individual air pollutant).

be seen compared to other U.S. sources, informing the judgment of the importance of emissions from this source category in any overall national strategy to address greenhouse gas emissions.

It is in this broader context that EPA considered the contribution of CAA section 202(a) sources. This provides useful information in determining the importance that should be attached to the emissions from the CAA section 202(a) sources.

In reaching her determination, the Administrator used two simple and straightforward comparisons to assess cause or contribute for CAA section 202(a) source categories: (1) As a share of total current global aggregate emissions of the well-mixed greenhouse gases; and (2) as a share of total current U.S. aggregate emissions of the well-mixed greenhouse gases.

Total well-mixed greenhouse gas emissions from CAA section 202(a) source categories were compared to total global emissions of the well-mixed greenhouse gases. The total air pollution problem, as already discussed, is the elevated and climbing levels of the six greenhouse gas concentrations in the atmosphere, which are global in nature because these concentrations are globally well mixed (whether they are emitted from CAA section 202(a) source categories or any other source within or outside the United States). In addition, comparisons were also made to U.S. total well-mixed greenhouse gases emissions to appreciate how CAA section 202(a) source categories fit into

the larger U.S. contribution to the global problem. It is typical for the Administrator to consider these kinds of comparisons of emissions of a pollutant in evaluating contribution to air pollution, such as the concentrations of that same pollutant in the atmosphere (e.g., the Administrator analyzes PM_{2.5} emissions to determine if a source category contributes to PM_{2.5} air pollution). When viewed in the circumstances discussed above, both of these comparisons provide useful information in determining whether these source categories should be judged as contributing to the total air pollution problem.

a. Section 202(a) of the CAA—Share of Global Aggregate Emissions of the Well-Mixed Greenhouse Gases

Global emissions of well-mixed greenhouse gases have been increasing, and are projected to continue increasing unless the major emitters take action to reduce emissions. Total global emissions of well-mixed greenhouse gases in 2005 (the most recent year for which data for all countries and all greenhouse gases are available)³⁹ were 38,726 teragrams of CO₂-equivalent (TgCO₂eq.)⁴⁰ This represents an increase in global greenhouse gas emissions of about 26 percent since 1990 (excluding land use, land use change and forestry). In 2005, total U.S. emissions of well-mixed greenhouse gases were responsible for 18 percent of global emissions, ranking only behind China, which was responsible for 19

percent of global emissions of well-mixed greenhouse gases.

In 2005 emissions of the well-mixed greenhouse gas pollutant from CAA section 202(a) source categories represented 4.3 percent of total global well-mixed greenhouse gas emissions and 28 percent of global transport well-mixed greenhouse gas emissions (Table 1 of these Findings). If CAA section 202(a) source categories' emissions of well-mixed greenhouse gas were ranked against total well-mixed greenhouse gas emissions for entire countries, CAA section 202(a) source category emissions would rank behind only China, the United States as a whole, Russia, and India, and would rank ahead of Japan, Brazil, Germany and every other country in the world. Indeed, countries with lower emissions than the CAA section 202(a) source categories are members of the 17 "major economies" "that meet to advance the exploration of concrete initiatives and joint ventures that increase the supply of clean energy while cutting greenhouse gas emissions." See <http://www.state.gov/g/oes/climate/mem/>. It would be anomalous, to say the least, to consider Japan and these other countries as major players in the global climate change community and an integral part of the solution, but not find that CAA section 202(a) source category emissions contribute to the global problem. Thus, the Administrator finds that emission of well-mixed greenhouse gases from CAA section 202(a) source categories contribute to the air pollution of well-mixed greenhouse gases.

TABLE 1—COMPARISON TO GLOBAL GREENHOUSE GAS (GHG) EMISSIONS (Tg CO₂E)

	2005	Sec 202(a) share (percent)
All U.S. GHG emissions	7,109	23.5
Global transport GHG emissions	5,968	28.0
All global GHG emissions	38,726	4.3

b. Section 202(a) of the CAA—Share of U.S. Aggregate Emissions of the Well-Mixed Greenhouse Gases

The Administrator considered compared total emissions of the well-mixed greenhouse gases from CAA section 202(a) source categories to total

U.S. emissions of the well-mixed greenhouse gases as an indication of the role these sources play in the total U.S. contribution to the air pollution problem causing climate change.⁴¹

In 2007, U.S. well-mixed greenhouse gas emissions were 7,150 TgCO₂eq. The dominant gas emitted was carbon

dioxide, mostly from fossil fuel combustion. Methane was the second largest well-mixed greenhouse gas, followed by N₂O, and the fluorinated gases (HFCs, PFCs, and SF₆). Electricity generation was the largest emitting sector (2,445 TgCO₂eq or 34 percent of

³⁹ The source of global greenhouse gas emissions data, against which comparisons are made, is the Climate Analysis Indicators Tool of the World Resources Institute (WRI) (2007). Note that for global comparisons, all emissions are from the year 2005, the most recent year for which data for all greenhouse gas emissions and all countries are available. WRI (2007) Climate Analysis Indicators Tool (CAIT). Available at <http://cait.wri.org>. Accessed August 5, 2009.

⁴⁰ One teragram (Tg) = 1 million metric tons. 1 metric ton = 1,000 kg = 2,205 lbs. Long-lived greenhouse gases are compared and summed together on a CO₂ equivalent basis by multiplying each gas by its Global Warming Potential (GWPs), as estimated by IPCC. In accordance with UNFCCC reporting procedures, the U.S. quantifies greenhouse gas emissions using the 100-year time frame values for GWPs established in the IPCC Second Assessment Report.

⁴¹ Greenhouse gas emissions data for the United States in this section have been updated since the Proposed Findings to reflect EPA's most up-to-date information, which includes data for the year 2007. The source of the U.S. greenhouse gas emissions data is the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007*, published in 2009 (hereinafter "U.S. Inventory").

total U.S. greenhouse gas emissions), followed by transportation (1,995 TgCO₂eq or 28 percent) and industry (1,386 TgCO₂eq or 19 percent). Emissions from the CAA section 202(a) source categories constitute the major part of the transportation sector. Land use, land use change, and forestry offset almost 15 percent of total U.S. emissions through net sequestration. Total U.S. well-mixed greenhouse gas emissions have increased by over 17 percent between 1990 and 2007. The electricity generation and transportation sectors have contributed the most to this increase.

In 2007 emissions of well-mixed greenhouse gases from CAA section 202(a) source categories collectively were the second largest emitter of well-mixed greenhouse gases within the United States (behind the electricity generating sector), emitting 1,663 TgCO₂eq and representing 23 percent of total U.S. emissions of well-mixed greenhouse gases (Table 2 of these Findings). The Administrator is keenly aware that the United States is the second largest emitter of well-mixed greenhouse gases. Part of analyzing whether a sector within the United States contributes to the global problem is to see how those emissions fit into the

contribution from the United States as a whole. This informs her judgment as to the importance of emissions from this source category in any overall national strategy to address greenhouse gas emissions. Thus, it is relevant that CAA section 202(a) source categories are the second largest emitter of well-mixed greenhouse gases in the country. This is part of the Administrator looking at the totality of the circumstances. Based on this the Administrator finds that emission of well-mixed greenhouse gases from CAA section 202(a) source categories contribute to the air pollution of well-mixed greenhouse gases.

TABLE 2—SECTORAL COMPARISON TO TOTAL U.S. GREENHOUSE GAS (GHG) EMISSIONS (Tg CO₂E)

U.S. emissions	1990	1995	2000	2005	2006	2007
Section 202(a) GHG emissions	1231.9	1364.4	1568.1	1670.5	1665.7	1663.1
Share of U.S. (%)	20.2%	21.1%	22.4%	23.5%	23.6%	23.3%
Electricity Sector emissions	1859.1	1989.0	2329.3	2429.4	2375.5	2445.1
Share of U.S. (%)	30.5%	30.8%	33.2%	34.2%	33.7%	34.2%
Industrial Sector emissions	1496.0	1524.5	1467.5	1364.9	1388.4	1386.3
Share of U.S. (%)	24.5%	23.6%	20.9%	19.2%	19.7%	19.4%
Total U.S. GHG emissions	6098.7	6463.3	7008.2	7108.6	7051.1	7150.1

C. Response to Key Comments on the Administrator's Cause or Contribute Finding

EPA received numerous public comments regarding the Administrator's proposed cause or contribute finding. Below is a brief discussion of some of the key comments. Responses to comments on this issue are also contained in the Response to Comments document, Volume 10.

1. The Administrator Reasonably Defined the "Air Pollutant" for the Cause or Contribute Analysis

a. The Supreme Court Held that Greenhouse Gases Fit Within the Definition of "Air Pollutant" in the CAA

Several commenters reiterate arguments already rejected by the Supreme Court, arguing that greenhouse gases do not fit into the definition of "air pollutant" under the CAA. In particular, at least one commenter contends that EPA must show how greenhouse gases impact or materially change "ambient air" when defining air pollutant and making the endangerment finding. This commenter argues that because carbon dioxide is a naturally occurring and necessary element in the atmosphere, it cannot be considered to materially change air.

These and similar arguments were already rejected by the Supreme Court in *Massachusetts v. EPA*, 549 U.S. 497 (2007). Briefs before the Supreme Court

also argued that carbon dioxide is an essential role for life on earth and therefore cannot be considered an air pollutant, and that the concentrations of greenhouse gases that are a potential problem are not in the "ambient air" that people breathe.

The Court rejected all of these and other arguments, noting that the statutory text forecloses these arguments. "The Clean Air Act's sweeping definition of 'air pollutant' includes 'any air pollution agent or combination of such agents, including any physical, chemical * * * substance or matter which is emitted into or otherwise enters the ambient air . * * *' § 7602(g) (emphasis added). On its face, the definition embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word 'any.' Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt 'physical [and] chemical * * * substance[s] which [are] emitted into * * * the ambient air.' The statute is unambiguous."

547 U.S. at 529–30 (footnotes omitted); see also *id.* at 530, n26 (the distinction regarding ambient air, however, finds no support in the text of the statute, which uses the phrase "the ambient air" without distinguishing between atmospheric layer.). Thus, the question of whether greenhouse gases fit within the definition of air pollutant

under the CAA has been decided by the Supreme Court and is not being revisited here.

b. The Definition of Air Pollutant May Include Substances Not Emitted by CAA Section 202(a) Sources

Many commenters argue that the definition of "air pollutant"—here well-mixed greenhouse gases—cannot include PFCs and SF₆ because they are not emitted by CAA section 202(a) motor vehicles and hence, cannot be part of any "air pollutant" emitted by such sources. They argue that by improperly defining "air pollutant" to include substances that are not present in motor vehicle emissions, the Agency has exceeded its statutory authority under CAA section 202(a). Commenters contend that past endangerment findings under CAA section 202(a) demonstrate EPA's consistent approach of defining "air pollutant(s)" in accordance with the CAA's clear direction, to include only those pollutants emitted from the relevant source category (citing Notice of Proposed Rulemaking for Heavy-Duty Engine and Vehicle Standards finding that "emissions of NO_x, VOCs, SO_x, and PM from heavy-duty trucks can reasonably be anticipated to endanger the public health or welfare." (65 FR 35436, June 2, 2000). Commenters argue that EPA itself is inconsistent in the Proposed Findings, sometimes referring

to “air pollutant” as the group of six greenhouse gases, and other times falling back on the four greenhouse gases emitted by motor vehicles.

EPA acknowledges that the Proposed Findings could have been clearer regarding the proposed definition of air pollutant, and how it was being applied to CAA section 202(a) sources, which emit only four of the six substances that meet the definition of well-mixed greenhouse gases. However, our interpretation does not exceed EPA’s authority under CAA section 202(a). It is reasonable to define the air pollutant under CAA section 202(a) to include substances that have similar attributes (as discussed above), even if not all of the substances that meet that definition are emitted by motor vehicles. For example, as commenters note, EPA has heavy duty truck standards applicable to VOCs and PM, but it is highly unlikely that heavy duty trucks emit *every* substance that is included in the group defined as VOC or PM. See 40 CFR 51.100(s) (defining volatile organic compound (VOC) as “any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions”, a list of exemptions are also included in the definition); 40 CFR 51.100(o) (defining particulate matter (PM) as “any airborne finely divided solid or liquid material with an aerodynamic diameter smaller than 100 micrometers”).

In this circumstance the number of substances included in the definition of well-mixed greenhouse gases is much smaller than other “group” air pollutants (e.g., six greenhouse gases versus hundreds of VOCs), and CAA section 202(a) sources emit an easily discernible number of these six substances. However, this does not mean that the definition of the well-mixed greenhouse gases as the air pollutant is unreasonable. By defining well-mixed greenhouse gases as a single air pollutant comprised of six substances with common attributes, the Administrator is giving effect to these shared attributes and how they are relevant to the air pollution to which they contribute. The fact that these six substances share these common, relevant attributes is true regardless of the source category being evaluated for contribution. Grouping these six substances as one air pollutant is reasonable regardless of whether a contribution analysis is undertaken for CAA section 202(a) sources that emit one subset of the six substances (e.g., carbon dioxide, CH₄, N₂O and HFCs, but

not PFCs and SF₆), or for another category of sources that may emit another subset. For example, electronics manufacturers that may emit N₂O, PFCs, HFCs, SF₆ and other fluorinated compounds, but not carbon dioxide or CH₄ unless there is on-site fuel combustion. In other words, it is not necessarily the source category being evaluated for contribution that determines the reasonableness of defining a group air pollutant based on the shared attributes of the group.

Even if EPA agreed with commenters, and defined the air pollutant as the group of four compounds emitted by CAA section 202(a) sources, it would not change the result. The Administrator would make the same contribution finding as it would have no material effect on the emissions comparisons discussed above.

c. It Was Reasonable for the Administrator To Define the Single Air Pollutant as the Group of Substances With Common Attributes

Several commenters disagree with EPA’s proposed definition of a single air pollutant composed of the six well-mixed greenhouse gases as a class. Commenters argue that the analogy to VOCs is misplaced because VOCs are all part of a defined group of chemicals, for which there are established quantification procedures, and for which there were extensive data showing that the group of compounds had demonstrated and quantifiable effects on ambient air and human health and welfare, and for which verifiable dispersion models existed. They contend this is in stark contrast to the entirely diverse set of organic and inorganic compounds EPA has lumped together for purposes of the Proposed Findings, and for which no model can accurately predict or quantify the actual impact or improvement resulting from controlling the compounds. Moreover, they argue that the gases EPA is proposing to list together as one pollutant are all generated by different processes and, if regulated, would require different types of controls; the four gases emitted by mobile sources can generally be limited only by using controls that are specific to each.

At least one commenter argues that EPA cannot combine greenhouse gases into one pollutant because their common attribute is not a “physical, chemical, biological or radioactive property” (quoting from CAA section 302(g)), but rather their effect or impacts on the environment. They say this differs from VOCs, which share the common attribute of volatility, or PM

which shares the physical property of being particles.

As discussed above, the well-mixed greenhouse gases share physical attributes, as well as attributes based on sound policy considerations. The definition of “air pollutant” in CAA section 302(g) does not limit consideration of common attributes to those that are “physical, chemical, biological or radioactive property” as one commenter claims. Rather, the definition’s use of the adjectives “physical, chemical, biological or radioactive” refer to the different types of substance or matter that is emitted. It is not a limitation on what characteristics the Administrator may consider when deciding how to group similar substances when defining a single air pollutant.

The common attributes that the Administrator considered when defining the well-mixed greenhouse gases are reasonable. While these six substances may originate from different processes, and require different control strategies, that does not detract from the fact that they are all long-lived, well-mixed in the atmosphere, directly emitted, of well-known radiative forcing, and generally grouped and considered together in climate change scientific and policy forums. Indeed, other group pollutants also originate from a variety of processes and a result may require different control technologies. For example, both a power plant and a dirt road can result in PM emissions, and the method to control such emissions at each source would be different. But these differences in origin or control do not undermine the reasonableness of considering PM as a single air pollutant. The fact that there are differences, as well as similarities, among the well-mixed greenhouse gases does not render the decision to group them together as one air pollutant unreasonable.

2. The Administrator’s Cause or Contribute Analysis Was Reasonable

a. The Administrator Does Not Need To Find Significant Contribution, or Establish a Bright Line

Many commenters essentially argue that EPA must establish a bright line below which it would never find contribution regardless of the air pollutant, air pollution, and other factors before the Agency. For example, some commenters argue that EPA must provide some basis for determining de minimis amounts that fall below the threshold of “contributing” to the endangerment of public health and welfare under CAA section 202(a).

Commenters take issue with EPA's statement that it "need not determine at this time the circumstances in which emissions would be trivial or de minimis and would not warrant a finding of contribution." Commenters argue that EPA cannot act arbitrarily by determining that a constituent contributing a certain percent to endangerment in one instance is de minimis and in another is contributing to endangerment of public health and welfare. They request that EPA revise the preamble language to make clear that the regulated community can rely on its past determinations with respect to "contribution" determinations to predict future agency action and argue that EPA should promulgate guidance on how it determines whether a contribution exceeds a de minimis level for purposes of CAA section 202(a) before finalizing the proposal.

The commenters that argue that the air pollution EPA must analyze to determine endangerment is limited to the air pollution resulting from new motor vehicles also argue that as a result, the contribution of emissions from new motor vehicles must be significant. They essentially contend that the endangerment and cause or contribute tests are inter-related and the universe of both tests is the same. In support of their argument, commenters argue that because the clause "cause, or contribute to, air pollution" is in plural form, it must be referring back to "any class or classes of new motor vehicles or new motor vehicle engines," demonstrating that EPA must consider only the emissions from new motor vehicles which emit the air pollution which endangers.

Since the Administrator issued the Proposed Findings, the DC Circuit issued another opinion discussing the concept of contribution. See *Catawba County v. EPA*, 571 F.3d 20 (DC Cir. 2009). This decision, along with others, supports the Administrator's interpretation that the level of contribution under CAA section 202(a) does not need to be significant. The Administrator is not required to establish a bright line below which she would never find contribution under any circumstances. Finally, it is reasonable for the Administrator to apply a "totality-of-the-circumstances test to implement a statute that confers broad discretionary authority, even if the test lacks a definite 'threshold' or 'clear line of demarcation to define an open-ended term." *Id.* at 39 (citations omitted).

In upholding EPA's PM_{2.5} attainment and nonattainment designation decisions, the DC Circuit analyzed CAA

section 107(d), which requires EPA to designate an area as nonattainment if it "contributes to ambient air quality in a nearby area" not attaining the national ambient air quality standards. *Id.* at 35. The court noted that it had previously held that the term "contributes" is ambiguous in the context of CAA language. See *EDF v. EPA*, 82 F.3d 451, 459 (DC Cir. 1996). "[A]mbiguities in statutes within an agency's jurisdiction to administer are delegations of authority to the agency to fill the statutory gap in reasonable fashion." 571 F.3d at 35 (citing *Nat's Cable & Telecomms. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 980 (2005)).

The court then proceeded to consider and reject petitioners' argument that the verb "contributes" in CAA section 107(d) necessarily connotes a significant causal relationship. Specifically, the DC Circuit again noted that the term is ambiguous, leaving it to EPA to interpret in a reasonable manner. In the context of this discussion, the court noted that "a contribution may simply exacerbate a problem rather than cause it * * *" 571 F.3d at 39. This is consistent with the DC Circuit's decision in *Bluewater Network v. EPA*, 370 F.3d 1 (DC Cir. 2004), in which the court noted that the term contribute in CAA section 213(a)(3) "[s]tanding alone, * * * has no inherent connotation as to the magnitude or importance of the relevant 'share' in the effect; certainly it does not incorporate any 'significance' requirement." 370 F.3d at 13. The court found that the bare "contribute" language invests the Administrator with discretion to exercise judgment regarding what constitutes a sufficient contribution for the purpose of making an endangerment finding. *Id.* at 14.

Finally, in *Catawba County*, the DC Circuit also rejected "petitioners' argument that EPA violated the statute by failing to articulate a quantified amount of contribution that would trigger" the regulatory action. 571 F.3d at 39. Although petitioners preferred that EPA establish a bright-line test, the court recognized that the statute did not require that EPA "quantify a uniform amount of contribution." *Id.*

Given this context, it is entirely reasonable for the Administrator to interpret CAA section 202(a) to require some level of contribution that, while more than de minimis or trivial, does not rise to the level of significance. Moreover, the approach suggested by at least one commenter collapses the two prongs of the test by requiring that contribution must be significant because any climate change impacts upon which an endangerment determination is made result solely from the greenhouse gas

emissions of motor vehicles. It essentially eliminates the "contribute" part of the "cause or contribute" portion of the test. This approach was clearly rejected by the en banc court in *Ethyl*, 541 F.2d at 29 (rejecting the argument that the emissions of the fuel additive to be regulated must "in and of itself, *i.e.* considered in isolation, endanger[] public health."); see also *Catawba County*, 571 F.3d at 39 (noting that even if the test required significant contribution it would be reasonable for EPA to find a county's addition of PM_{2.5} is significant even though the problem would persist in its absence). It is the commenter, not EPA that is ignoring the statutory language. Whether or not the clause "cause, or contribute to, air pollution" refers back to "any class or classes of new motor vehicles or new motor vehicle engines," or to "emission of any air pollutant," the language of CAA section 202(a) clearly contemplates that emission of an air pollutant from any class or classes may merely contribute to, versus cause, the air pollution which endangers.

It is also reasonable for EPA to decline to establish a "bright-line 'objective' test of contribution." 571 F.3d at 39. As noted in the Proposed Findings, when exercising her judgment, the Administrator not only considers the cumulative impact, but also looks at the totality of the circumstances (*e.g.*, the air pollutant, the air pollution, the nature of the endangerment, the type of source category, the number of sources in the source category, and the number and type of other source categories that may emit the air pollutant) when determining whether the emissions justify regulation under the CAA. *Id.* (It is reasonable for an agency to adopt a totality-of-the-circumstances test).

Even if EPA agreed that a level of significance was required to find contribution, for the reasons discussed above, EPA would find that the contribution from CAA section 202(a) source categories is significant. Their emissions are larger than the great majority of emitting countries, larger than several major emitting countries, and they constitute one of the largest parts of the U.S. emissions inventory.

b. The Unique Global Aspects of Climate Change Are an Appropriate Consideration in the Contribution Analysis

Some commenters disagree with statements in the Proposed Findings that the "unique, global aspects of the climate change problem tend to support a finding that lower levels of emissions should be considered to contribute to the air pollution than might otherwise

be appropriate when considering contribution to a local or regional air pollution problem.” They argue there is no basis in the CAA or existing EPA policy for this position, and that it reveals an apparent effort to expand EPA’s authority to the “truly trivial or de minimis” sources that are acknowledged to be outside the scope of regulation, in that it expands EPA’s authority to regulate pollutants to address global effects.

Commenters also assert that contrary to EPA’s position, lower contribution numbers are appropriate when looking at local pollution, like nonattainment concerns—in other words, in the context of a statutory provision like CAA section 213 specifically aimed at targeting small source categories to help nonattainment areas meet air quality standards. However, they conclude this policy is simply inapplicable in the context of global climate change.

As discussed above, the term “contribute” is ambiguous and subject to the Administrator’s reasonable interpretation. It is entirely appropriate for the Administrator to look at the totality of the circumstances when making a finding of contribution. In this case, the Administrator believes that the global nature of the problem justifies looking at contribution in a way that takes account of these circumstances. More specifically, because climate change is a global problem that results from global greenhouse gas emissions, there are more sources emitting greenhouse gases (in terms both of absolute numbers of sources and types of sources) than EPA typically encounters when analyzing contribution towards a more localized air pollution problem. From a percentage perspective, there are no dominating sources and fewer sources that would even be considered to be close to dominating. The global problem is much more the result of numerous and varied sources each of which emit what might seem to be smaller percentage amounts when compared to the total. The Administrator’s approach recognizes this reality, and focuses on evaluating the relative importance of the CAA section 202(a) source categories compared to other sources when viewed in this context.

This recognition of the unique totality of the circumstances before the Administrator now as compared to previous contribution decisions is entirely appropriate. It is not an attempt by the Administrator to regulate “truly trivial or de minimis” sources, or to regulate sources based on their global effects. The Administrator is determining whether greenhouse gas

emissions from CAA section 202(a) sources contribute to an air pollution problem is endangering U.S. public health and welfare. As discussed in the Proposed Findings, no single greenhouse gas source category dominates on the global scale, and many (if not all) individual greenhouse gas source categories could appear small in comparison to the total, when, in fact, they could be very important contributors in terms of both absolute emissions or in comparison to other source categories, globally or within the United States. If the United States and the rest of the world are to combat the risks associated with global climate change, contributors must do their part even if their contributions to the global problem, measured in terms of percentage, are smaller than typically encountered when tackling solely regional or local environmental issues. The commenters’ approach, if used globally, would effectively lead to a tragedy of the commons, whereby no country or source category would be accountable for contributing to the global problem of climate change, and nobody would take action as the problem persists and worsens. The Administrator’s approach, on the contrary, avoids this kind of approach, and is a reasonable exercise of her discretion to determine contribution in the global context in which this issue arises.

Importantly, as discussed above, the contribution from CAA section 202(a) sources is anything but trivial or de minimis under any interpretation of contribution. See, *Massachusetts v. EPA*, 549 U.S. at 1457–58 (“Judged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence, * * * to global warming”).

c. The Administrator Reasonably Relied on Comparisons of Emissions From Existing CAA Section 202(a) Source Categories

i. It Was Reasonable To Use Existing Emissions From Existing CAA Section 202(a) Source Categories Instead of Projecting Future Emissions From New CAA Section 202(a) Source Categories

Many commenters argue that EPA improperly evaluated the emissions from the entire motor vehicle fleet, and it is required to limit its calculation to just emissions from new motor vehicles. Thus the emissions that EPA should consider in the cause or contribute determination is far less than the 4.3 percent of U.S. greenhouse gas emissions attributed to motor vehicles

in the Proposed Findings, because this number includes both new and existing motor vehicles. One commenter calculated the emissions from new motor vehicles as being 1.8 percent of global emissions, assuming approximately one year of new motor vehicle production in the United States (11 million vehicles) in a total global count currently of approximately 600 million motor vehicles.

In the Proposed Findings, EPA determined the emissions from the entire fleet of motor vehicles in the United States for a certain calendar year. EPA explained that, consistent with its traditional practice, it used the recent motor vehicle emissions inventory for the entire fleet as a surrogate for estimates of emissions for just new motor vehicles and engines. This was appropriate because future projected emissions are uncertain and current emissions data are a reasonable proxy for near-term emissions.

In effect, EPA is using the inventory for the current fleet of motor vehicles as a reasonable surrogate for a projection of the inventory from new motor vehicles over the upcoming years. New motor vehicles are produced year in and year out, and over time the fleet changes over to a fleet composed of such vehicles. This occurs in a relatively short time frame, compared to the time period at issue for endangerment. Because new motor vehicles are produced each year, and continue to emit over their entire life, over a relatively short period of time the emission from the entire fleet is from vehicles produced after a certain date. In addition, the emissions from new motor vehicles are not limited to the emissions that occur only during the one year when they are new, but are emissions over the entire life of the vehicle.

In such cases, EPA has traditionally used the recent emissions from the entire current fleet of motor vehicles as a reasonable surrogate for such a projection instead of trying to project and model those emissions. While this introduces some limited degree of uncertainty, the difference between recent actual emissions from the fleet and projected future emissions from the fleet is not expected to differ in any way that would substantively change the decision made concerning cause or contribution. There is not a specific numerical bright line that must be achieved, and the numerical percentages are not treated and do not need to be treated as precise values. This approach provides a reasonable and clear indication of the relative magnitudes involved, and EPA does not believe that attempting to make future

projections (for both vehicles and the emissions value they are compared to) would provide any greater degree of accuracy or precision in developing such a relative comparison.

ii. The Administrator Did Not Have To Use a Subset or Reduced Emissions Estimate From Existing CAA Section 202(a) Source Categories

Several commenters note that although EPA looks at emissions from all motor vehicles regulated under CAA section 202(a) in its contribution analysis, the Presidential announcement in May 2009 indicated that EPA was planning to regulate only a subset of 202(a) sources. Thus, they question whether the correct contribution analysis should look only at the emissions from that subset and not all CAA section 202(a) sources. Some commenters also argue that because emission standards will not eliminate all greenhouse gas emissions from motor vehicles, the comparison should compare the amount of greenhouse gas emissions “reduced” by those standards to the global greenhouse emissions. They also contend that the cost of the new standards will cause individual consumers, businesses, and other vehicle purchasers to hold on to their existing vehicles to a greater extent, thereby decreasing the amount of emissions reductions attributable to the standard and appropriately considered in the contribution analysis. Some commenters go further and contend that EPA also can only include that incremental reduction that the EPA regulations will achieve beyond any reductions resulting from CAFE standards that NHTSA will set.

Although the May announcement and September proposed rule involved only the light duty motor vehicle sector, the Administrator is making this finding for all classes of new motor vehicles under CAA section 202(a). Thus, although the announcement and proposed rule involve light duty vehicles, EPA is working to develop standards for the rest of the classes of new motor vehicles under CAA section 202(a). As the Supreme Court noted, EPA has “significant latitude as to the manner, timing, content, and coordination of its regulations with those of other agencies.” *Massachusetts v. EPA*, 549 U.S. at 533.

The argument that the Administrator can only look at that portion of emissions that will be reduced by any CAA section 202(a) standards, and even then only the reduction beyond those attributable to CAFE rules, finds no basis in the statutory language. The language in CAA section 202(a) requires that the Administrator set “standards

applicable to the emission of any air pollutant from [new motor vehicles], which in [her] judgment cause, or contribute to, air pollution which [endangers].” It does not say set “standards applicable to the emission of any air pollutant from [new motor vehicles], if in [her] judgment the emissions of that air pollutant as reduced by that standard cause, or contribute to, air pollution which [endangers].” As discussed above, the decisions on cause or contribute and endangerment are separate and distinct from the decisions on what emissions standards to set under CAA section 202(a). The commenter’s approach would improperly integrate these separate decisions. Indeed, because, as discussed above, the Administrator does not have to propose standards concurrent with the endangerment and cause or contribute findings, she would have to be prescient to know at the time of the contribution finding exactly the amount of the reduction that would be achieved by the standards to be set. As discussed above, for purposes of these findings we look at what would be the emissions from new motor vehicles if no action were taken. Current emissions from the existing CAA section 202(a) vehicle fleet are an appropriate estimate.

d. The Administrator Reasonably Compared CAA Section 202(a) Source Emissions to Both Global and Domestic Emissions of Well-Mixed Greenhouse Gases

EPA received many comments on the appropriate comparison(s) for the contribution analysis. Several commenters argue that in order to get around the “problem” of basing an endangerment finding upon a source category that contributes only 1.8 percent annually to global greenhouse gas emissions, EPA inappropriately also made comparisons to total U.S. greenhouse gas emissions. These commenters argue that a comparison of CAA section 202(a) source emissions to U.S. greenhouse gas emissions, versus global emissions, is arbitrary for purposes of the cause or contribute analysis, because it conflicts with the Administrator’s definition of “air pollution,” as well as the nature of global warming. They note that throughout the Proposed Findings, the Administrator focuses on the global nature of greenhouse gas. Thus, they continue, while the percentage share of motor vehicle emissions at the U.S. level may be relevant for some purposes, it is irrelevant to a finding of whether these emissions contribute to the air pollution, which the Administrator has proposed to define on

a global rather than a domestic basis. Commenters also accuse EPA of arbitrarily picking and choosing when it takes a global approach (e.g., endangerment finding) and when it does not (e.g., contribution findings).

The language of CAA section 202(a) is silent regarding how the Administrator is to make her contribution analysis. While it requires that the Administrator assess whether emission of an air pollutant contributes to air pollution which endangers, it does not limit *how* she may undertake that assessment. It surely is reasonable that the Administrator look at how CAA section 202(a) source category emissions compare to global emissions on an absolute basis, by themselves. But the United States as a nation is the second largest emitter of greenhouse gases. It is entirely appropriate for the Administrator to decide that part of understanding how a U.S. source category emitting greenhouse gases fits into the bigger picture of global climate change is to appreciate how that source category fits into the contribution from the United States as a whole, where the United States as a country is a major emitter of greenhouse gases. Knowing that CAA section 202(a) source categories are the second largest emitter of well-mixed greenhouse gases in the country is relevant to understanding what role they play in the global problem and hence whether they “contribute” to the global problem. Moreover, the Administrator is not “picking and choosing” when she applies a global or domestic approach in these Findings. Rather, she is looking at both of these emissions comparisons as appropriate under the applicable science, facts, and law.

e. The Amount of Well-Mixed Greenhouse Gas Emissions From CAA Section 202(a) Sources Reasonably Supports a Finding of Contribution

Many commenters argue that the “cause or contribute” prong of the Proposal’s endangerment analysis fails to satisfy the applicable legal standard, which requires more than a minimal contribution to the “air pollution reasonably anticipated to endanger public health or welfare.” They contend that emissions representing approximately four percent of total global greenhouse gas emissions are a minimal contribution to global greenhouse gas concentrations.

EPA disagrees. As stated above, CAA section 202(a) source category total emissions of well-mixed greenhouse gases are higher than most countries in the world; countries that the U.S. and others believe play a major role in the

global climate change problem. Moreover, the percent of global well-mixed greenhouse gas emissions that CAA section 202(a) source categories represent is higher than percentages that the EPA has found contribute to air pollution problems. *See Bluewater Network*, 370 F.3d at 15 (“For Fairbanks, this contribution was equivalent to 1.2 percent of the total daily CO inventory for 2001.”) As noted above, there is no bright line for assessing contribution, but as discussed in the Proposed Findings and above, when looking at a global problem like climate change, with many sources of emissions and no dominating sources from a global perspective, it is reasonable to consider that lower percentages contribute than one may consider when looking at a local or regional problem involving fewer sources of emissions. The Administrator agrees that “[j]udged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence, * * * to global warming.” *Massachusetts v. EPA*, 549 U.S. at 525.

VI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order (EO) 12866 (58 FR 51735, October 4, 1993), this action is a “significant regulatory action” because it raises novel policy issues. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under EO 12866 and any changes made in response to Office of Management and Budget (OMB) recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

This action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* Burden is defined at 5 CFR 1320.3(b). These Findings do not impose an information collection request on any person.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small

organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this action on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration’s (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

Because these Findings do not impose any requirements, the Administrator certifies that this action will not have a significant economic impact on a substantial number of small entities. This action does not impose any requirements on small entities. The endangerment and cause or contribute findings do not in-and-of-themselves impose any new requirements but rather set forth the Administrator’s determination on whether greenhouse gases in the atmosphere may reasonably be anticipated to endanger public health or welfare, and whether emissions of greenhouse gases from new motor vehicles and engines contribute to this air pollution. Accordingly, the action affords no opportunity for EPA to fashion for small entities less burdensome compliance or reporting requirements or timetables or exemptions from all or part of the Findings.

D. Unfunded Mandates Reform Act

This action contains no Federal mandates under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531–1538 for State, local, or tribal governments or the private sector. The action imposes no enforceable duty on any State, local or tribal governments or the private sector. Therefore, this action is not subject to the requirements of sections 202 or 205 of the UMRA.

This action is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. This finding does not impose any requirements on industry or other entities.

E. Executive Order 13132: Federalism

This action does not have federalism implications. Because this action does not impose requirements on any entities, it will not have substantial direct effects on the States, on the relationship between the national

government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Thus, Executive Order 13132 does not apply to this action.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This action does not have substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes, nor does it impose any enforceable duties on any Indian tribes. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the EO has the potential to influence the regulation. This action is not subject to EO 13045 because it does not establish an environmental standard intended to mitigate health or safety risks. Although the Administrator considered health and safety risks as part of these Findings, the Findings themselves do not impose a standard intended to mitigate those risks.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a “significant energy action” as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy because it does not impose any requirements.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (“NTTAA”), Public Law 104–113, 12(d) (15 U.S.C. at 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus

standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This action does not involve technical standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (EO) 12898 (59 FR 7629, Feb. 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent

practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that these Findings will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. Although the Administrator considered climate change risks to minority or low-income populations as part of these Findings, this action does not impose a standard intended to mitigate those risks and does not impose requirements on any entities.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States. This action is not a “major rule” as defined by 5 U.S.C. 804(2). This rule will be effective January 14, 2010.

Dated: December 7, 2009.

Lisa P. Jackson,

Administrator.

[FR Doc. E9–29537 Filed 12–14–09; 8:45 am]

BILLING CODE 6560–50–P

RULE 2

**75 Fed. Reg. 25,324
(May 7, 2010)
(Tailpipe Rule)**



Federal Register

**Friday,
May 7, 2010**

Part II

Environmental Protection Agency

Department of Transportation

**National Highway Traffic Safety
Administration**

**40 CFR Parts 85, 86, and 600; 49 CFR
Parts 531, 533, 536, et al.**

**Light-Duty Vehicle Greenhouse Gas
Emission Standards and Corporate
Average Fuel Economy Standards; Final
Rule**

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 85, 86, and 600

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Parts 531, 533, 536, 537 and 538

[EPA-HQ-OAR-2009-0472; FRL-9134-6; NHTSA-2009-0059]

RIN 2060-AP58; RIN 2127-AK50

Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule

AGENCY: Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA).

ACTION: Final rule.

SUMMARY: EPA and NHTSA are issuing this joint Final Rule to establish a National Program consisting of new standards for light-duty vehicles that will reduce greenhouse gas emissions and improve fuel economy. This joint Final Rule is consistent with the National Fuel Efficiency Policy announced by President Obama on May 19, 2009, responding to the country's critical need to address global climate change and to reduce oil consumption. EPA is finalizing greenhouse gas emissions standards under the Clean Air Act, and NHTSA is finalizing Corporate Average Fuel Economy standards under the Energy Policy and Conservation Act, as amended. These standards apply to passenger cars, light-duty trucks, and

medium-duty passenger vehicles, covering model years 2012 through 2016, and represent a harmonized and consistent National Program. Under the National Program, automobile manufacturers will be able to build a single light-duty national fleet that satisfies all requirements under both programs while ensuring that consumers still have a full range of vehicle choices. NHTSA's final rule also constitutes the agency's Record of Decision for purposes of its National Environmental Policy Act (NEPA) analysis.

DATES: This final rule is effective on July 6, 2010, *sixty days after date of publication in the Federal Register*. The incorporation by reference of certain publications listed in this regulation is approved by the Director of the Federal Register as of July 6, 2010.

ADDRESSES: EPA and NHTSA have established dockets for this action under Docket ID No. EPA-HQ-OAR-2009-0472 and NHTSA-2009-0059, respectively. All documents in the docket are listed on the <http://www.regulations.gov> Web site. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through <http://www.regulations.gov> or in hard copy at the following locations: **EPA:** EPA Docket Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public

Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744. **NHTSA:** Docket Management Facility, M-30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590. The Docket Management Facility is open between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT:

EPA: Tad Wyszor, Office of Transportation and Air Quality, Assessment and Standards Division, Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor MI 48105; telephone number: 734-214-4332; fax number: 734-214-4816; e-mail address: wyszor.tad@epa.gov, or Assessment and Standards Division Hotline; telephone number (734) 214-4636; e-mail address asinfo@epa.gov. **NHTSA:** Rebecca Yoon, Office of Chief Counsel, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590. Telephone: (202) 366-2992.

SUPPLEMENTARY INFORMATION:

Does this action apply to me?

This action affects companies that manufacture or sell new light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles, as defined under EPA's CAA regulations,¹ and passenger automobiles (passenger cars) and non-passenger automobiles (light trucks) as defined under NHTSA's CAFE regulations.² Regulated categories and entities include:

Category	NAICS codes ^A	Examples of potentially regulated entities
Industry	336111, 336112	Motor vehicle manufacturers.
Industry	811112, 811198, 541514	Commercial Importers of Vehicles and Vehicle Components.

^ANorth American Industry Classification System (NAICS).

This list is not intended to be exhaustive, but rather provides a guide regarding entities likely to be regulated by this action. To determine whether particular activities may be regulated by this action, you should carefully examine the regulations. You may direct questions regarding the applicability of this action to the person listed in **FOR FURTHER INFORMATION CONTACT**.

¹“Light-duty vehicle,” “light-duty truck,” and “medium-duty passenger vehicle” are defined in 40 CFR 86.1803-01. Generally, the term “light-duty vehicle” means a passenger car, the term “light-duty truck” means a pick-up truck, sport-utility vehicle,

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or minivan of up to 8,500 lbs gross vehicle weight rating, and “medium-duty passenger vehicle” means a sport-utility vehicle or passenger van from 8,500 to 10,000 lbs gross vehicle weight rating. Medium-

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I. Overview of Joint EPA/NHTSA National Program

A. Introduction

The National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) are each announcing final rules whose benefits will address the urgent and

closely intertwined challenges of energy independence and security and global warming. These rules will implement a strong and coordinated Federal greenhouse gas (GHG) and fuel economy program for passenger cars, light-duty trucks, and medium-duty passenger vehicles (hereafter light-duty vehicles), referred to as the National Program. The rules will achieve substantial reductions of GHG emissions and improvements in fuel economy from the light-duty vehicle part of the transportation sector, based on technology that is already being commercially applied in most cases and that can be incorporated at a reasonable cost. NHTSA's final rule also constitutes the agency's Record of Decision for purposes of its NEPA analysis.

This joint rulemaking is consistent with the President's announcement on May 19, 2009 of a National Fuel Efficiency Policy of establishing consistent, harmonized, and streamlined requirements that would reduce GHG emissions and improve fuel economy for all new cars and light-duty trucks sold in the United States.³ The National Program will deliver additional environmental and energy benefits, cost savings, and administrative efficiencies on a nationwide basis that would likely not be available under a less coordinated approach. The National Program also represents regulatory convergence by making it possible for the standards of two different Federal agencies and the standards of California and other states to act in a unified fashion in providing these benefits. The National Program will allow automakers to produce and sell a single fleet nationally, mitigating the additional costs that manufacturers would otherwise face in having to comply with multiple sets of Federal and State standards. This joint notice is also consistent with the Notice of Upcoming Joint Rulemaking issued by DOT and EPA on May 19, 2009⁴ and responds to the President's January 26, 2009 memorandum on CAFE standards for model years 2011 and beyond,⁵ the

details of which can be found in Section IV of this joint notice.

Climate change is widely viewed as a significant long-term threat to the global environment. As summarized in the Technical Support Document for EPA's Endangerment and Cause or Contribute Findings under Section 202(a) of the Clean Air Act, anthropogenic emissions of GHGs are very likely (90 to 99 percent probability) the cause of most of the observed global warming over the last 50 years.⁶ The primary GHGs of concern are carbon dioxide (CO₂), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Mobile sources emitted 31 percent of all U.S. GHGs in 2007 (transportation sources, which do not include certain off-highway sources, account for 28 percent) and have been the fastest-growing source of U.S. GHGs since 1990.⁷ Mobile sources addressed in the recent endangerment and contribution findings under CAA section 202(a)—light-duty vehicles, heavy-duty trucks, buses, and motorcycles—accounted for 23 percent of all U.S. GHG in 2007.⁸ Light-duty vehicles emit CO₂, methane, nitrous oxide, and hydrofluorocarbons and are responsible for nearly 60 percent of all mobile source GHGs and over 70 percent of Section 202(a) mobile source GHGs. For light-duty vehicles in 2007, CO₂ emissions represent about 94 percent of all greenhouse emissions (including HFCs), and the CO₂ emissions measured over the EPA tests used for fuel economy compliance represent about 90 percent of total light-duty vehicle GHG emissions.⁹¹⁰

Improving energy security by reducing our dependence on foreign oil has been a national objective since the first oil price shocks in the 1970s. Net petroleum imports now account for approximately 60 percent of U.S.

⁶ "Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act" Docket: EPA-HQ-OAR-2009-0472-11292, <http://epa.gov/climatechange/endangerment.html>.

⁷ U.S. Environmental Protection Agency. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007. EPA 430–R–09–004. Available at http://epa.gov/climatechange/emissions/downloads09/GHG2007entire_report-508.pdf.

⁸ U.S. EPA. 2009 Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act. Washington, DC, pp. 180–194. Available at <http://epa.gov/climatechange/endangerment/downloads/Endangerment%20TSD.pdf>.

⁹ U.S. Environmental Protection Agency. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007. EPA 430–R–09–004. Available at http://epa.gov/climatechange/emissions/downloads09/GHG2007entire_report-508.pdf.

¹⁰ U.S. Environmental Protection Agency. RIA, Chapter 2.

³ President Obama Announces National Fuel Efficiency Policy, The White House, May 19, 2009. Available at: http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/. Remarks by the President on National Fuel Efficiency Standards, The White House, May 19, 2009. Available at: http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-national-fuel-efficiency-standards/.

⁴ 74 FR 24007 (May 22, 2009).

⁵ Available at: http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_Fuel_Economy/.

petroleum consumption. World crude oil production is highly concentrated, exacerbating the risks of supply disruptions and price shocks. Tight global oil markets led to prices over \$100 per barrel in 2008, with gasoline reaching as high as \$4 per gallon in many parts of the U.S., causing financial hardship for many families. The export of U.S. assets for oil imports continues to be an important component of the historically unprecedented U.S. trade deficits. Transportation accounts for about two-thirds of U.S. petroleum consumption. Light-duty vehicles account for about 60 percent of transportation oil use, which means that they alone account for about 40 percent of all U.S. oil consumption.

1. Building Blocks of the National Program

The National Program is both needed and possible because the relationship between improving fuel economy and reducing CO₂ tailpipe emissions is a very direct and close one. The amount of those CO₂ emissions is essentially constant per gallon combusted of a given type of fuel. Thus, the more fuel efficient a vehicle is, the less fuel it burns to travel a given distance. The less fuel it burns, the less CO₂ it emits in traveling that distance.¹¹ While there are emission control technologies that reduce the pollutants (e.g., carbon monoxide) produced by imperfect combustion of fuel by capturing or converting them to other compounds, there is no such technology for CO₂. Further, while some of those pollutants can also be reduced by achieving a more complete combustion of fuel, doing so only increases the tailpipe emissions of CO₂. Thus, there is a single pool of technologies for addressing these twin problems, *i.e.*, those that reduce fuel consumption and thereby reduce CO₂ emissions as well.

a. DOT's CAFE Program

In 1975, Congress enacted the Energy Policy and Conservation Act (EPCA), mandating that NHTSA establish and implement a regulatory program for motor vehicle fuel economy to meet the various facets of the need to conserve energy, including ones having energy independence and security, environmental and foreign policy implications. Fuel economy gains since 1975, due both to the standards and market factors, have resulted in saving

billions of barrels of oil and avoiding billions of metric tons of CO₂ emissions. In December 2007, Congress enacted the Energy Independence and Securities Act (EISA), amending EPCA to require substantial, continuing increases in fuel economy standards.

The CAFE standards address most, but not all, of the real world CO₂ emissions because a provision in EPCA as originally enacted in 1975 requires the use of the 1975 passenger car test procedures under which vehicle air conditioners are not turned on during fuel economy testing.¹² Fuel economy is determined by measuring the amount of CO₂ and other carbon compounds emitted from the tailpipe, not by attempting to measure directly the amount of fuel consumed during a vehicle test, a difficult task to accomplish with precision. The carbon content of the test fuel¹³ is then used to calculate the amount of fuel that had to be consumed per mile in order to produce that amount of CO₂. Finally, that fuel consumption figure is converted into a miles-per-gallon figure. CAFE standards also do not address the 5–8 percent of GHG emissions that are not CO₂, *i.e.*, nitrous oxide (N₂O), and methane (CH₄) as well as emissions of CO₂ and hydrofluorocarbons (HFCs) related to operation of the air conditioning system.

b. EPA's GHG Standards for Light-duty Vehicles

Under the Clean Air Act EPA is responsible for addressing air pollutants from motor vehicles. On April 2, 2007, the U.S. Supreme Court issued its opinion in *Massachusetts v. EPA*,¹⁴ a case involving EPA's a 2003 denial of a petition for rulemaking to regulate GHG emissions from motor vehicles under section 202(a) of the Clean Air Act (CAA).¹⁵ The Court held that GHGs fit within the definition of air pollutant in the Clean Air Act and further held that the Administrator must determine whether or not emissions from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. The Court further ruled that, in making these decisions, the EPA Administrator is required to follow the language of section 202(a) of the CAA. The Court

rejected the argument that EPA cannot regulate CO₂ from motor vehicles because to do so would *de facto* tighten fuel economy standards, authority over which has been assigned by Congress to DOT. The Court stated that “[b]ut that DOT sets mileage standards in no way licenses EPA to shirk its environmental responsibilities. EPA has been charged with protecting the public's ‘health’ and ‘welfare’, a statutory obligation wholly independent of DOT's mandate to promote energy efficiency.” The Court concluded that “[t]he two obligations may overlap, but there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency.”¹⁶ The case was remanded back to the Agency for reconsideration in light of the Court's decision.¹⁷

On December 15, 2009, EPA published two findings (74 FR 66496): That emissions of GHGs from new motor vehicles and motor vehicle engines contribute to air pollution, and that the air pollution may reasonably be anticipated to endanger public health and welfare.

c. California Air Resources Board Greenhouse Gas Program

In 2004, the California Air Resources Board approved standards for new light-duty vehicles, which regulate the emission of not only CO₂, but also other GHGs. Since then, thirteen states and the District of Columbia, comprising approximately 40 percent of the light-duty vehicle market, have adopted California's standards. These standards apply to model years 2009 through 2016 and require CO₂ emissions for passenger cars and the smallest light trucks of 323 g/mi in 2009 and 205 g/mi in 2016, and for the remaining light trucks of 439 g/mi in 2009 and 332 g/mi in 2016. On June 30, 2009, EPA granted California's request for a waiver of preemption under the CAA.¹⁸ The granting of the waiver permits California and the other states to proceed with implementing the California emission standards.

In addition, to promote the National Program, in May 2009, California announced its commitment to take several actions in support of the National Program, including revising its

¹⁶ 549 U.S. at 531–32.

¹⁷ For further information on *Massachusetts v. EPA* see the July 30, 2008 Advance Notice of Proposed Rulemaking, “Regulating Greenhouse Gas Emissions under the Clean Air Act”, 73 FR 44354 at 44397. There is a comprehensive discussion of the litigation's history, the Supreme Court's findings, and subsequent actions undertaken by the Bush Administration and the EPA from 2007–2008 in response to the Supreme Court remand. Also see 74 FR 18886, at 1888–90 (April 24, 2009).

¹⁸ 74 FR 32744 (July 8, 2009).

¹² Although EPCA does not require the use of 1975 test procedures for light trucks, those procedures are used for light truck CAFE standard testing purposes.

¹³ This is the method that EPA uses to determine compliance with NHTSA's CAFE standards.

¹⁴ 549 U.S. 497 (2007).

¹⁵ 68 FR 52922 (Sept. 8, 2003).

¹¹ Panel on Policy Implications of Greenhouse Warming, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, “Policy Implications of Greenhouse Warming: Mitigation, Adaptation, and the Science Base,” National Academies Press, 1992. p. 287.

program for MYs 2009–2011 to facilitate compliance by the automakers, and revising its program for MYs 2012–2016 such that compliance with the Federal GHG standards will be deemed to be compliance with California's GHG standards. This will allow the single national fleet produced by automakers to meet the two Federal requirements and to meet California requirements as well. California is proceeding with a rulemaking intended to revise its 2004 regulations to meet its commitments. Several automakers and their trade associations also announced their commitment to take several actions in support of the National Program, including not contesting the final GHG and CAFE standards for MYs 2012–2016, not contesting any grant of a waiver of preemption under the CAA for California's GHG standards for certain model years, and to stay and then dismiss all pending litigation challenging California's regulation of GHG emissions, including litigation concerning preemption under EPCA of California's and other states' GHG standards.

2. Public Participation

The agencies proposed their respective rules on September 28, 2009 (74 FR 49454), and received a large number of comments representing many perspectives on the proposed rule. The agencies received oral testimony at three public hearings in different parts of the country, and received written comments from more than 130 organizations, including auto manufacturers and suppliers, States, environmental and other non-governmental organizations (NGOs), and over 129,000 comments from private citizens.

The vast majority of commenters supported the central tenets of the proposed CAFE and GHG programs. That is, there was broad support from most organizations for a National Program that achieves a level of 250 gram/mile fleet average CO₂, which would be 35.5 miles per gallon if the automakers were to meet this CO₂ level solely through fuel economy improvements. The standards will be phased in over model years 2012 through 2016 which will allow manufacturers to build a common fleet of vehicles for the domestic market. In general, commenters from the automobile industry supported the proposed standards as well as the credit opportunities and other compliance provisions providing flexibility, while also making some recommendations for changes. Environmental and public interest non-governmental organizations (NGOs), as well as most States that

commented, were also generally supportive of the National Program standards. Many of these organizations also expressed concern about the possible impact on program benefits, depending on how the credit provisions and flexibilities are designed. The agencies also received specific comments on many aspects of the proposal.

Throughout this notice, the agencies discuss many of the key issues arising from the public comments and the agencies' responses. In addition, the agencies have addressed all of the public comments in the Response to Comments document associated with this final rule.

B. Summary of the Joint Final Rule and Differences From the Proposal

In this joint rulemaking, EPA is establishing GHG emissions standards under the Clean Air Act (CAA), and NHTSA is establishing Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act of 1975 (EPCA), as amended by the Energy Independence and Security Act of 2007 (EISA). The intention of this joint rulemaking is to set forth a carefully coordinated and harmonized approach to implementing these two statutes, in accordance with all substantive and procedural requirements imposed by law.

NHTSA and EPA have coordinated closely and worked jointly in developing their respective final rules. This is reflected in many aspects of this joint rule. For example, the agencies have developed a comprehensive Joint Technical Support Document (TSD) that provides a solid technical underpinning for each agency's modeling and analysis used to support their standards. Also, to the extent allowed by law, the agencies have harmonized many elements of program design, such as the form of the standard (the footprint-based attribute curves), and the definitions used for cars and trucks. They have developed the same or similar compliance flexibilities, to the extent allowed and appropriate under their respective statutes, such as averaging, banking, and trading of credits, and have harmonized the compliance testing and test protocols used for purposes of the fleet average standards each agency is finalizing. Finally, under their respective statutes, each agency is called upon to exercise its judgment and determine standards that are an appropriate balance of various relevant statutory factors. Given the common technical issues before each agency, the similarity of the factors each agency is to consider and balance, and the

authority of each agency to take into consideration the standards of the other agency, both EPA and NHTSA are establishing standards that result in a harmonized National Program.

This joint final rule covers passenger cars, light-duty trucks, and medium-duty passenger vehicles built in model years 2012 through 2016. These vehicle categories are responsible for almost 60 percent of all U.S. transportation-related GHG emissions. EPA and NHTSA expect that automobile manufacturers will meet these standards by utilizing technologies that will reduce vehicle GHG emissions and improve fuel economy. Although many of these technologies are available today, the emissions reductions and fuel economy improvements finalized in this notice will involve more widespread use of these technologies across the light-duty vehicle fleet. These include improvements to engines, transmissions, and tires, increased use of start-stop technology, improvements in air conditioning systems, increased use of hybrid and other advanced technologies, and the initial commercialization of electric vehicles and plug-in hybrids. NHTSA's and EPA's assessments of likely vehicle technologies that manufacturers will employ to meet the standards are discussed in detail below and in the Joint TSD.

The National Program is estimated to result in approximately 960 million metric tons of total carbon dioxide equivalent emissions reductions and approximately 1.8 billion barrels of oil savings over the lifetime of vehicles sold in model years (MYs) 2012 through 2016. In total, the combined EPA and NHTSA 2012–2016 standards will reduce GHG emissions from the U.S. light-duty fleet by approximately 21 percent by 2030 over the level that would occur in the absence of the National Program. These actions also will provide important energy security benefits, as light-duty vehicles are about 95 percent dependent on oil-based fuels. The agencies project that the total benefits of the National Program will be more than \$240 billion at a 3% discount rate, or more than \$190 billion at a 7% discount rate. In the discussion that follows in Sections III and IV, each agency explains the related benefits for their individual standards.

Together, EPA and NHTSA estimate that the average cost increase for a model year 2016 vehicle due to the National Program will be less than \$1,000. The average U.S. consumer who purchases a vehicle outright is estimated to save enough in lower fuel costs over the first three years to offset

these higher vehicle costs. However, most U.S. consumers purchase a new vehicle using credit rather than paying cash and the typical car loan today is a five year, 60 month loan. These consumers will see immediate savings due to their vehicle's lower fuel consumption in the form of a net reduction in annual costs of \$130–\$180 throughout the duration of the loan (that is, the fuel savings will outweigh the increase in loan payments by \$130–\$180 per year). Whether a consumer takes out a loan or purchases a new vehicle outright, over the lifetime of a model year 2016 vehicle, the consumer's net savings could be more than \$3,000. The average 2016 MY vehicle will emit 16 fewer metric tons of CO₂-equivalent emissions (that is, CO₂ emissions plus HFC air conditioning leakage emissions) during its lifetime. Assumptions that underlie these conclusions are discussed in greater detail in the agencies' respective regulatory impact analyses and in Section III.H.5 and Section IV.

This joint rule also results in important regulatory convergence and certainty to automobile companies. Absent this rule, there would be three separate Federal and State regimes independently regulating light-duty vehicles to reduce fuel consumption and GHG emissions: NHTSA's CAFE standards, EPA's GHG standards, and the GHG standards applicable in California and other States adopting the California standards. This joint rule will allow automakers to meet both the NHTSA and EPA requirements with a single national fleet, greatly simplifying the industry's technology, investment and compliance strategies. In addition, to promote the National Program, California announced its commitment to take several actions, including revising its program for MYs 2012–2016 such that compliance with the Federal GHG standards will be deemed to be compliance with California's GHG standards. This will allow the single national fleet used by automakers to meet the two Federal requirements and to meet California requirements as well. California is proceeding with a rulemaking intended to revise its 2004 regulations to meet its commitments. EPA and NHTSA are confident that these GHG and CAFE standards will successfully harmonize both the Federal and State programs for MYs 2012–2016 and will allow our country to achieve the increased benefits of a single, nationwide program to reduce light-duty vehicle GHG emissions and reduce the country's dependence on fossil fuels

by improving these vehicles' fuel economy.

A successful and sustainable automotive industry depends upon, among other things, continuous technology innovation in general, and low GHG emissions and high fuel economy vehicles in particular. In this respect, this action will help spark the investment in technology innovation necessary for automakers to successfully compete in both domestic and export markets, and thereby continue to support a strong economy.

While this action covers MYs 2012–2016, many stakeholders encouraged EPA and NHTSA to also begin working toward standards for MY 2017 and beyond that would maintain a single nationwide program. The agencies recognize the importance of and are committed to a strong, coordinated national program for light-duty vehicles for model years beyond 2016.

Key elements of the National Program finalized today are the level and form of the GHG and CAFE standards, the available compliance mechanisms, and general implementation elements. These elements are summarized in the following section, with more detailed discussions about EPA's GHG program following in Section III, and about NHTSA's CAFE program in Section IV. This joint final rule responds to the wide array of comments that the agencies received on the proposed rule. This section summarizes many of the major comments on the primary elements of the proposal and describes whether and how the final rule has changed, based on the comments and additional analyses. Major comments and the agencies' responses to them are also discussed in more detail in later sections of this preamble. For a full summary of public comments and EPA's and NHTSA's responses to them, please see the Response to Comments document associated with this final rule.

1. Joint Analytical Approach

NHTSA and EPA have worked closely together on nearly every aspect of this joint final rule. The extent and results of this collaboration are reflected in the elements of the respective NHTSA and EPA rules, as well as the analytical work contained in the Joint Technical Support Document (Joint TSD). The Joint TSD, in particular, describes important details of the analytical work that are shared, as well as any differences in approach. These include the build up of the baseline and reference fleets, the derivation of the shape of the curves that define the standards, a detailed description of the

costs and effectiveness of the technology choices that are available to vehicle manufacturers, a summary of the computer models used to estimate how technologies might be added to vehicles, and finally the economic inputs used to calculate the impacts and benefits of the rules, where practicable.

EPA and NHTSA have jointly developed attribute curve shapes that each agency is using for its final standards. Further details of these functions can be found in Sections III and IV of this preamble as well as Chapter 2 of the Joint TSD. A critical technical underpinning of each agency's analysis is the cost and effectiveness of the various control technologies. These are used to analyze the feasibility and cost of potential GHG and CAFE standards. A detailed description of all of the technology information considered can be found in Chapter 3 of the Joint TSD (and for A/C, Chapter 2 of the EPA RIA). This detailed technology data forms the inputs to computer models that each agency uses to project how vehicle manufacturers may add those technologies in order to comply with the new standards. These are the OMEGA and Volpe models for EPA and NHTSA, respectively. The models and their inputs can also be found in the docket. Further description of the model and outputs can be found in Sections III and IV of this preamble, and Chapter 3 of the Joint TSD. This comprehensive joint analytical approach has provided a sound and consistent technical basis for each agency in developing its final standards, which are summarized in the sections below.

The vast majority of public comments expressed strong support for the joint analytical work performed for the proposal. Commenters generally agreed with the analytical work and its results, and supported the transparency of the analysis and its underlying data. Where commenters raised specific points, the agencies have considered them and made changes where appropriate. The agencies' further evaluation of various technical issues also led to a limited number of changes. A detailed discussion of these issues can be found in Section II of this preamble, and the Joint TSD.

2. Level of the Standards

In this notice, EPA and NHTSA are establishing two separate sets of standards, each under its respective statutory authorities. EPA is setting national CO₂ emissions standards for light-duty vehicles under section 202(a) of the Clean Air Act. These standards will require these vehicles to meet an

estimated combined average emissions level of 250 grams/mile of CO₂ in model year 2016. NHTSA is setting CAFE standards for passenger cars and light trucks under 49 U.S.C. 32902. These standards will require manufacturers of those vehicles to meet an estimated combined average fuel economy level of 34.1 mpg in model year 2016. The standards for both agencies begin with the 2012 model year, with standards increasing in stringency through model year 2016. They represent a harmonized approach that will allow industry to build a single national fleet that will satisfy both the GHG requirements under the CAA and CAFE requirements under EPCA/EISA.

Given differences in their respective statutory authorities, however, the agencies' standards include some important differences. Under the CO₂ fleet average standards adopted under CAA section 202(a), EPA expects manufacturers to take advantage of the option to generate CO₂-equivalent credits by reducing emissions of hydrofluorocarbons (HFCs) and CO₂ through improvements in their air conditioner systems. EPA accounted for these reductions in developing its final CO₂ standards. NHTSA did not do so because EPCA does not allow vehicle manufacturers to use air conditioning credits in complying with CAFE standards for passenger cars.¹⁹ CO₂ emissions due to air conditioning operation are not measured by the test procedure mandated by statute for use in establishing and enforcing CAFE standards for passenger cars. As a result, improvement in the efficiency of passenger car air conditioners is not considered as a possible control technology for purposes of CAFE.

These differences regarding the treatment of air conditioning improvements (related to CO₂ and HFC reductions) affect the relative stringency of the EPA standard and NHTSA

standard for MY 2016. The 250 grams per mile of CO₂ equivalent emissions limit is equivalent to 35.5 mpg²⁰ if the automotive industry were to meet this CO₂ level all through fuel economy improvements. As a consequence of the prohibition against NHTSA's allowing credits for air conditioning improvements for purposes of passenger car CAFE compliance, NHTSA is setting fuel economy standards that are estimated to require a combined (passenger car and light truck) average fuel economy level of 34.1 mpg by MY 2016.

The vast majority of public comments expressed strong support for the National Program standards, including the stringency of the agencies' respective standards and the phase-in from model year 2012 through 2016. There were a number of comments supporting standards more stringent than proposed, and a few others supporting less stringent standards, in particular for the 2012–2015 model years. The agencies' consideration of comments and their updated technical analyses led to only very limited changes in the footprint curves and did not change the agencies' projections that the nationwide fleet will achieve a level of 250 grams/mile by 2016 (equivalent to 35.5 mpg). The responses to these comments are discussed in more detail in Sections III and IV, respectively, and in the Response to Comments document.

As proposed, NHTSA and EPA's final standards, like the standards NHTSA promulgated in March 2009 for MY 2011, are expressed as mathematical functions depending on vehicle footprint. Footprint is one measure of vehicle size, and is determined by multiplying the vehicle's wheelbase by the vehicle's average track width.²¹ The standards that must be met by each manufacturer's fleet will be determined by computing the sales-weighted

average (harmonic average for CAFE) of the targets applicable to each of the manufacturer's passenger cars and light trucks. Under these footprint-based standards, the levels required of individual manufacturers will depend, as noted above, on the mix of vehicles sold. NHTSA's and EPA's respective standards are shown in the tables below. It is important to note that the standards are the attribute-based curves established by each agency. The values in the tables below reflect the agencies' projection of the corresponding fleet levels that will result from these attribute-based curves.

As a result of public comments and updated economic and future fleet projections, EPA and NHTSA have updated the attribute based curves for this final rule, as discussed in detail in Section II.B of this preamble and Chapter 2 of the Joint TSD. This update in turn affects costs, benefits, and other impacts of the final standards. Thus, the agencies have updated their overall projections of the impacts of the final rule standards, and these results are only slightly different from those presented in the proposed rule.

As shown in Table I.B.2–1, NHTSA's fleet-wide CAFE-required levels for passenger cars under the final standards are projected to increase from 33.3 to 37.8 mpg between MY 2012 and MY 2016. Similarly, fleet-wide CAFE levels for light trucks are projected to increase from 25.4 to 28.8 mpg. NHTSA has also estimated the average fleet-wide required levels for the combined car and truck fleets. As shown, the overall fleet average CAFE level is expected to be 34.1 mpg in MY 2016. These numbers do not include the effects of other flexibilities and credits in the program. These standards represent a 4.3 percent average annual rate of increase relative to the MY 2011 standards.²²

TABLE I.B.2–1—AVERAGE REQUIRED FUEL ECONOMY (mpg) UNDER FINAL CAFE STANDARDS

	2011-base	2012	2013	2014	2015	2016
Passenger Cars	30.4	33.3	34.2	34.9	36.2	37.8
Light Trucks	24.4	25.4	26.0	26.6	27.5	28.8
Combined Cars & Trucks	27.6	29.7	30.5	31.3	32.6	34.1

¹⁹ There is no such statutory limitation with respect to light trucks.

²⁰ The agencies are using a common conversion factor between fuel economy in units of miles per gallon and CO₂ emissions in units of grams per mile. This conversion factor is 8,887 grams CO₂ per gallon gasoline fuel. Diesel fuel has a conversion

factor of 10,180 grams CO₂ per gallon diesel fuel though for the purposes of this calculation, we are assuming 100% gasoline fuel.

²¹ See 49 CFR 523.2 for the exact definition of "footprint."

²² Because required CAFE levels depend on the mix of vehicles sold by manufacturers in a model

year, NHTSA's estimate of future required CAFE levels depends on its estimate of the mix of vehicles that will be sold in that model year. NHTSA currently estimates that the MY 2011 standards will require average fuel economy levels of 30.4 mpg for passenger cars, 24.4 mpg for light trucks, and 27.6 mpg for the combined fleet.

Accounting for the expectation that some manufacturers could continue to pay civil penalties rather than achieving required CAFE levels, and the ability to

use FFV credits,²³ NHTSA estimates that the CAFE standards will lead to the following average achieved fuel economy levels, based on the

projections of what each manufacturer's fleet will comprise in each year of the program:²⁴

TABLE I.B.2-2—PROJECTED FLEET-WIDE ACHIEVED CAFE LEVELS UNDER THE FINAL FOOTPRINT-BASED CAFE STANDARDS (mpg)

	2012	2013	2014	2015	2016
Passenger Cars	32.3	33.5	34.2	35.0	36.2
Light Trucks	24.5	25.1	25.9	26.7	27.5
Combined Cars & Trucks	28.7	29.7	30.6	31.5	32.7

NHTSA is also required by EISA to set a minimum fuel economy standard for domestically manufactured passenger cars in addition to the attribute-based passenger car standard. The minimum standard “shall be the greater of (A) 27.5 miles per gallon; or (B) 92 percent of the average fuel economy projected by the

Secretary for the combined domestic and non-domestic passenger automobile fleets manufactured for sale in the United States by all manufacturers in the model year.* * * ”²⁵

Based on NHTSA's current market forecast, the agency's estimates of these minimum standards under the MY 2012–2016 CAFE standards (and, for

comparison, the final MY 2011 standard) are summarized below in Table I.B.2–3.²⁶ For eventual compliance calculations, the final calculated minimum standards will be updated to reflect the average fuel economy level required under the final standards.

TABLE I.B.2-3—ESTIMATED MINIMUM STANDARD FOR DOMESTICALLY MANUFACTURED PASSENGER CARS UNDER MY 2011 AND MY 2012–2016 CAFE STANDARDS FOR PASSENGER CARS (mpg)

2011	2012	2013	2014	2015	2016
27.8	30.7	31.4	32.1	33.3	34.7

EPA is establishing GHG emissions standards, and Table I.B.2–4 provides EPA's estimates of their projected overall fleet-wide CO₂ equivalent

emission levels.²⁷ The g/mi values are CO₂ equivalent values because they include the projected use of air conditioning (A/C) credits by

manufacturers, which include both HFC and CO₂ reductions.

TABLE I.B.2-4—PROJECTED FLEET-WIDE EMISSIONS COMPLIANCE LEVELS UNDER THE FOOTPRINT-BASED CO₂ STANDARDS (g/mi)

	2012	2013	2014	2015	2016
Passenger Cars	263	256	247	236	225
Light Trucks	346	337	326	312	298
Combined Cars & Trucks	295	286	276	263	250

As shown in Table I.B.2–4, fleet-wide CO₂ emission level requirements for cars are projected to increase in stringency from 263 to 225 g/mi between MY 2012 and MY 2016. Similarly, fleet-wide CO₂ equivalent emission level requirements for trucks are projected to increase in stringency from 346 to 298 g/mi. As shown, the overall fleet average CO₂ level requirements are projected to increase

in stringency from 295 g/mi in MY 2012 to 250 g/mi in MY 2016.

EPA anticipates that manufacturers will take advantage of program flexibilities such as flexible fueled vehicle credits and car/truck credit trading. Due to the credit trading between cars and trucks, the estimated improvements in CO₂ emissions are distributed differently than shown in Table I.B.2–4, where full manufacturer compliance without credit trading is

assumed. Table I.B.2–5 shows EPA's projection of the achieved emission levels of the fleet for MY 2012 through 2016, which does consider the impact of car/truck credit transfer and the increase in emissions due to certain program flexibilities including flex fueled vehicle credits and the temporary lead time allowance alternative standards. The use of optional air conditioning credits is considered both in this analysis of achieved levels and of the

²³ The penalties are similar in function to essentially unlimited, fixed-price allowances.

²⁴ NHTSA's estimates account for availability of CAFE credits for the sale of flexible-fuel vehicles (FFVs), and for the potential that some manufacturers will pay civil penalties rather than comply with the CAFE standards. This yields NHTSA's estimates of the real-world fuel economy

that will likely be achieved under the final CAFE standards. NHTSA has not included any potential impact of car-truck credit transfer in its estimate of the achieved CAFE levels.

²⁵ 49 U.S.C. 32902(b)(4).

²⁶ In the March 2009 final rule establishing MY 2011 standards for passenger cars and light trucks, NHTSA estimated that the minimum required

CAFE standard for domestically manufactured passenger cars would be 27.8 mpg under the MY 2011 passenger car standard.

²⁷ These levels do not include the effect of flexible fuel credits, transfer of credits between cars and trucks, temporary lead time allowance, or any other credits with the exception of air conditioning.

compliance levels described above. As can be seen in Table I.B.2–5, the projected achieved levels are slightly

higher for model years 2012–2015 due to EPA’s assumptions about manufacturers’ use of the regulatory

flexibilities, but by model year 2016 the achieved level is projected to be 250 g/mi for the fleet.

TABLE I.B.2–5—PROJECTED FLEET-WIDE ACHIEVED EMISSION LEVELS UNDER THE FOOTPRINT-BASED CO₂ STANDARDS (g/mi)

	2012	2013	2014	2015	2016
Passenger Cars	267	256	245	234	223
Light Trucks	365	353	340	324	303
Combined Cars & Trucks	305	293	280	266	250

Several auto manufacturers stated that the increasingly stringent requirements for fuel economy and GHG emissions in the early years of the program should follow a more linear phase-in. The agencies’ consideration of comments and of their updated technical analyses did not lead to changes to the phase-in of the standards discussed above. This issue is discussed in more detail in Sections II.D, and in Sections III and IV.

NHTSA’s and EPA’s technology assessment indicates there is a wide range of technologies available for manufacturers to consider in upgrading vehicles to reduce GHG emissions and improve fuel economy. Commenters were in general agreement with this assessment.²⁸ As noted, these include improvements to the engines such as use of gasoline direct injection and downsized engines that use turbochargers to provide performance similar to that of larger engines, the use of advanced transmissions, increased use of start-stop technology, improvements in tire rolling resistance, reductions in vehicle weight, increased use of hybrid and other advanced technologies, and the initial commercialization of electric vehicles and plug-in hybrids. EPA is also projecting improvements in vehicle air conditioners including more efficient as well as low leak systems. All of these technologies are already available today, and EPA’s and NHTSA’s assessments are that manufacturers will be able to meet the standards through more widespread use of these technologies across the fleet.

With respect to the practicability of the standards in terms of lead time, during MYs 2012–2016 manufacturers are expected to go through the normal automotive business cycle of redesigning and upgrading their light-duty vehicle products, and in some cases introducing entirely new vehicles

not on the market today. This rule allows manufacturers the time needed to incorporate technology to achieve GHG reductions and improve fuel economy during the vehicle redesign process. This is an important aspect of the rule, as it avoids the much higher costs that would occur if manufacturers needed to add or change technology at times other than their scheduled redesigns. This time period also provides manufacturers the opportunity to plan for compliance using a multi-year time frame, again consistent with normal business practice. Over these five model years, there will be an opportunity for manufacturers to evaluate almost every one of their vehicle model platforms and add technology in a cost effective way to control GHG emissions and improve fuel economy. This includes redesign of the air conditioner systems in ways that will further reduce GHG emissions. Various commenters stated that the proposed phase-in of the standards should be introduced more aggressively, less aggressively, or in a more linear manner. However, our consideration of these comments about the phase-in, as well as our revised analyses, leads us to conclude that the general rate of introduction of the standards as proposed remains appropriate. This conclusion is also not affected by the slight difference from the proposal in the final footprint-based curves. These issues are addressed further in Sections III and IV.

Both agencies considered other standards as part of the rulemaking analyses, both more and less stringent than those proposed. EPA’s and NHTSA’s analyses of alternative standards are contained in Sections III and IV of this preamble, respectively, as well as the agencies’ respective RIAs.

The CAFE and GHG standards described above are based on determining emissions and fuel economy using the city and highway test procedures that are currently used in the CAFE program. Some environmental and other organizations

commented that the test procedures should be improved to reflect more real-world driving conditions; auto manufacturers in general do not support such changes to the test procedures at this time. Both agencies recognize that these test procedures are not fully representative of real-world driving conditions. For example, EPA has adopted more representative test procedures that are used in determining compliance with emissions standards for pollutants other than GHGs. These test procedures are also used in EPA’s fuel economy labeling program. However, as discussed in Section III, the current information on effectiveness of the individual emissions control technologies is based on performance over the CAFE test procedures. For that reason, EPA is using the current CAFE test procedures for the CO₂ standards and is not changing those test procedures in this rulemaking. NHTSA, as discussed above, is limited by statute in what test procedures can be used for purposes of passenger car testing, although there is no such statutory limitation with respect to test procedures for trucks. However, the same reasons for not changing the truck test procedures apply for CAFE as well.

Both EPA and NHTSA are interested in developing programs that employ test procedures that are more representative of real-world driving conditions, to the extent authorized under their respective statutes. This is an important issue, and the agencies intend to continue to evaluate it in the context of a future rulemaking to address standards for model year 2017 and thereafter. This could include consideration of a range of test procedure changes to better represent real-world driving conditions in terms of speed, acceleration, deceleration, ambient temperatures, use of air conditioners, and the like. With respect to air conditioner operation, EPA discusses the public comments on these issues and the final procedures for determining emissions credits for controls on air conditioners in Section III.

²⁸ The close relationship between emissions of CO₂—the most prevalent greenhouse gas emitted by motor vehicles—and fuel consumption, means that the technologies to control CO₂ emissions and to improve fuel economy overlap to a great degree.

Finally, based on the information EPA developed in its recent rulemaking that updated its fuel economy labeling program to better reflect average real-world fuel economy, the calculation of fuel savings and CO₂ emissions reductions that will be achieved by the CAFE and GHG standards includes adjustments to account for the difference between the fuel economy level measured in the CAFE test procedure and the fuel economy actually achieved on average under real-world driving conditions. These adjustments are industry averages for the vehicles' performance as a whole, however, and are not a substitute for the information on effectiveness of individual control technologies that will be explored for purposes of a future GHG and CAFE rulemaking.

3. Form of the Standards

NHTSA and EPA proposed attribute-based standards for passenger cars and light trucks. NHTSA adopted an attribute approach based on vehicle footprint in its Reformed CAFE program for light trucks for model years 2008–2011,²⁹ and recently extended this approach to passenger cars in the CAFE rule for MY 2011 as required by EISA.³⁰ The agencies also proposed using vehicle footprint as the attribute for the GHG and CAFE standards. Footprint is defined as a vehicle's wheelbase multiplied by its track width—in other words, the area enclosed by the points at which the wheels meet the ground. Most commenters that expressed a view on this topic supported basing the standards on an attribute, and almost all of these supported the proposed choice of vehicle footprint as an appropriate attribute. The agencies continue to believe that the standards are best expressed in terms of an attribute, and

that the footprint attribute is the most appropriate attribute on which to base the standards. These issues are further discussed later in this notice and in Chapter 2 of the Joint TSD.

Under the footprint-based standards, each manufacturer will have a GHG and CAFE target unique to its fleet, depending on the footprints of the vehicle models produced by that manufacturer. A manufacturer will have separate footprint-based standards for cars and for trucks. Generally, larger vehicles (*i.e.*, vehicles with larger footprints) will be subject to less stringent standards (*i.e.*, higher CO₂ grams/mile standards and lower CAFE standards) than smaller vehicles. This is because, generally speaking, smaller vehicles are more capable of achieving lower levels of CO₂ and higher levels of fuel economy than larger vehicles. While a manufacturer's fleet average standard could be estimated throughout the model year based on projected production volume of its vehicle fleet, the standard to which the manufacturer must comply will be based on its final model year production figures. A manufacturer's calculation of fleet average emissions at the end of the model year will thus be based on the production-weighted average emissions of each model in its fleet.

The final footprint-based standards are very similar in shape to those proposed. NHTSA and EPA include more discussion of the development of the final curves in Section II below, with a full discussion in the Joint TSD. In addition, a full discussion of the equations and coefficients that define the curves is included in Section III for the CO₂ curves and Section IV for the mpg curves. The following figures illustrate the standards. First, Figure I.B.3–1 shows the fuel economy (mpg) car standard curve.

Under an attribute-based standard, every vehicle model has a performance

target (fuel economy for the CAFE standards, and CO₂ g/mile for the GHG emissions standards), the level of which depends on the vehicle's attribute (for this rule, footprint). The manufacturers' fleet average performance is determined by the production-weighted³¹ average (for CAFE, harmonic average) of those targets. NHTSA and EPA are setting CAFE and CO₂ emissions standards defined by constrained linear functions and, equivalently, piecewise linear functions.³² As a possible option for future rulemakings, the constrained linear form was introduced by NHTSA in the 2007 NPRM proposing CAFE standards for MY 2011–2015.

NHTSA is establishing the attribute curves below for assigning a fuel economy level to an individual vehicle's footprint value, for model years 2012 through 2016. These mpg values will be production weighted to determine each manufacturer's fleet average standard for cars and trucks. Although the general model of the equation is the same for each vehicle category and each year, the parameters of the equation differ for cars and trucks. Each parameter also changes on an annual basis, resulting in the yearly increases in stringency. Figure I.B.3–1 below illustrates the passenger car CAFE standard curves for model years 2012 through 2016 while Figure I.B.3–2 below illustrates the light truck standard curves for model years 2012–2016. The MY 2011 final standards for cars and trucks, which are specified by a constrained logistic function rather than a constrained linear function, are shown for comparison.

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³¹ Based on vehicles produced for sale in the United States.

³² The equations are equivalent but are specified differently due to differences in the agencies' respective models.

²⁹ 71 FR 17566 (Apr. 6, 2006).

³⁰ 74 FR 14196 (Mar. 30, 2009).

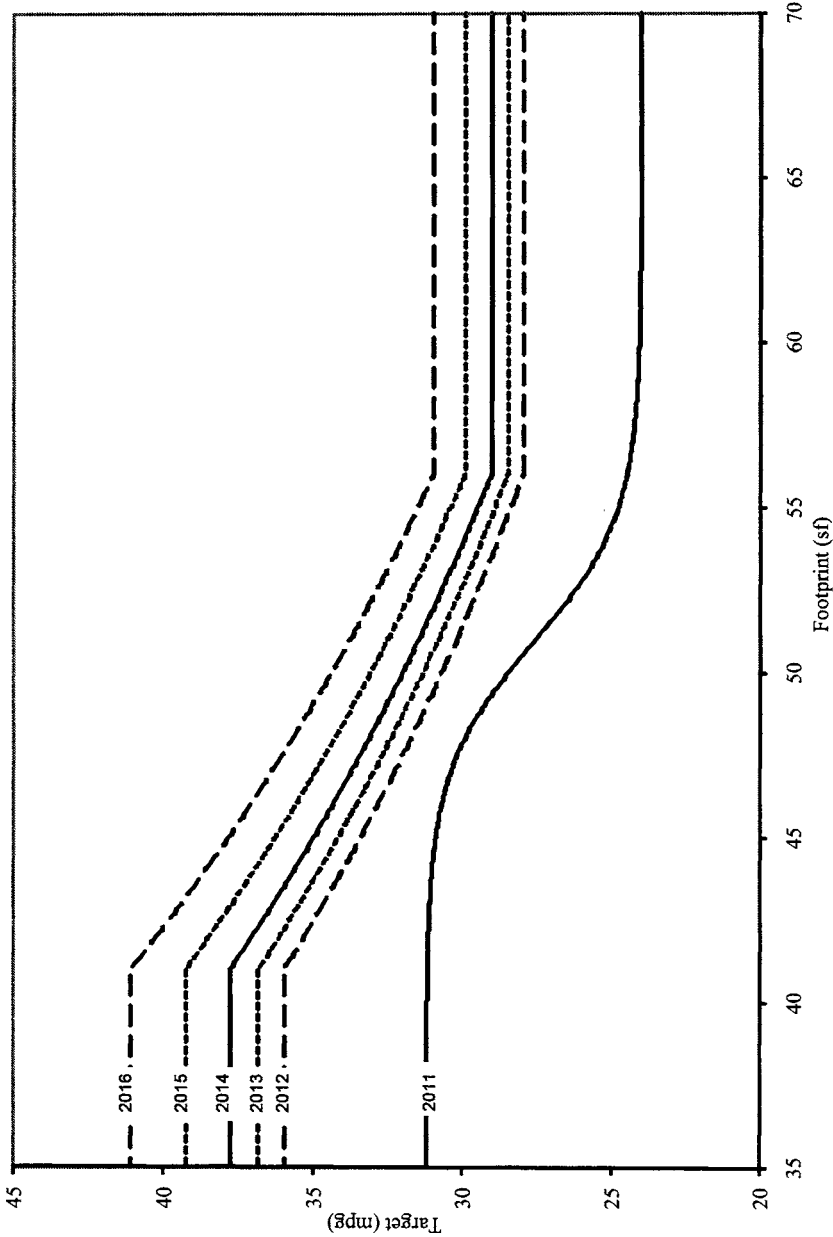


Figure I.B.3-1. MY 2011 and MY 2012-2016 Passenger Car Fuel Economy Targets

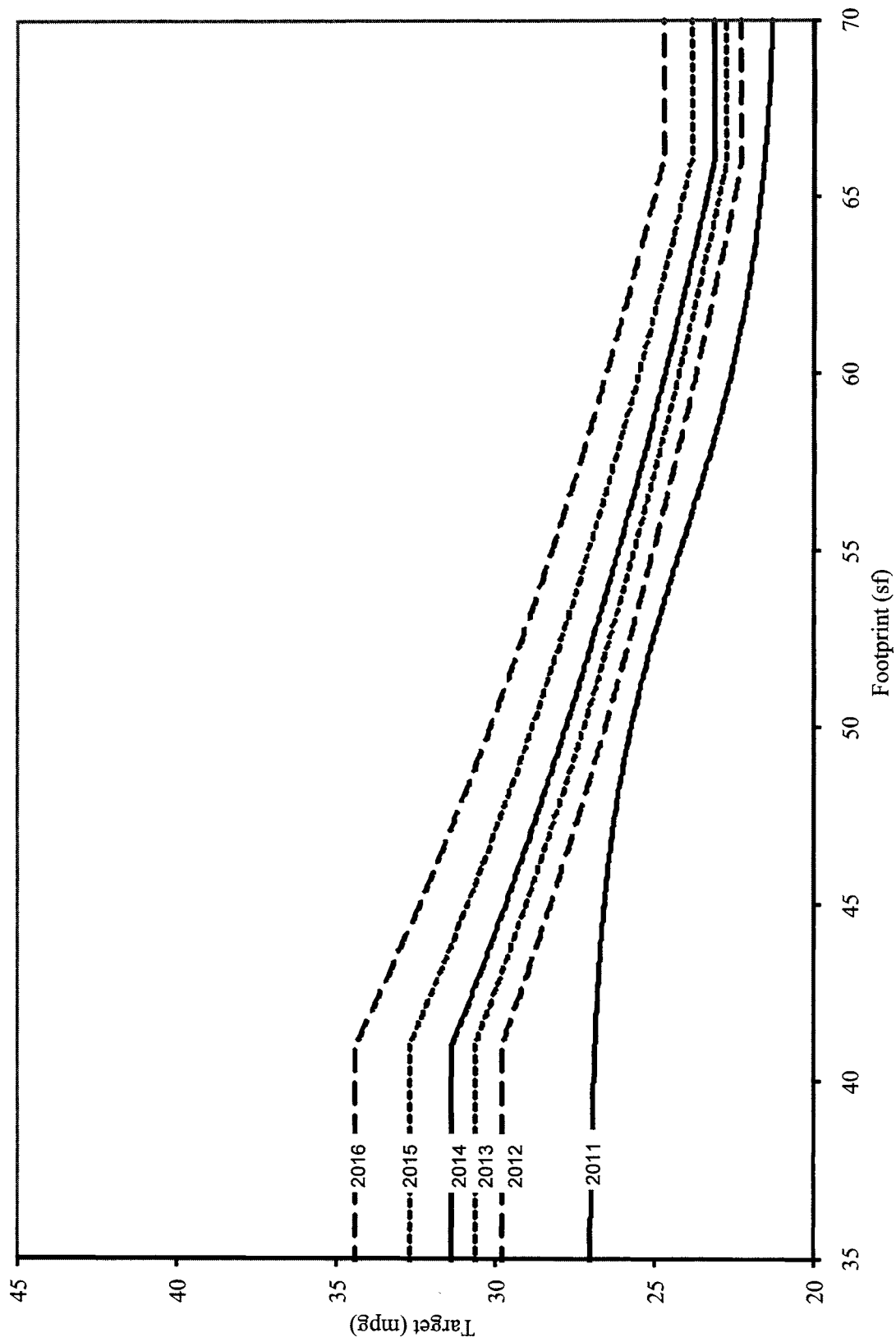


Figure I.B.3-2. MY 2011 and MY 2012-2016 Light Truck Fuel Economy Targets

EPA is establishing the attribute curves below for assigning a CO₂ level to an individual vehicle's footprint value, for model years 2012 through 2016. These CO₂ values will be production weighted to determine each manufacturer's fleet average standard

for cars and trucks. As with the CAFE curves above, the general form of the equation is the same for each vehicle category and each year, but the parameters of the equation differ for cars and trucks. Again, each parameter also changes on an annual basis, resulting in

the yearly increases in stringency. Figure I.B.3-3 below illustrates the CO₂ car standard curves for model years 2012 through 2016 while Figure I.B.3-4 shows the CO₂ truck standard curves for model years 2012-2016.

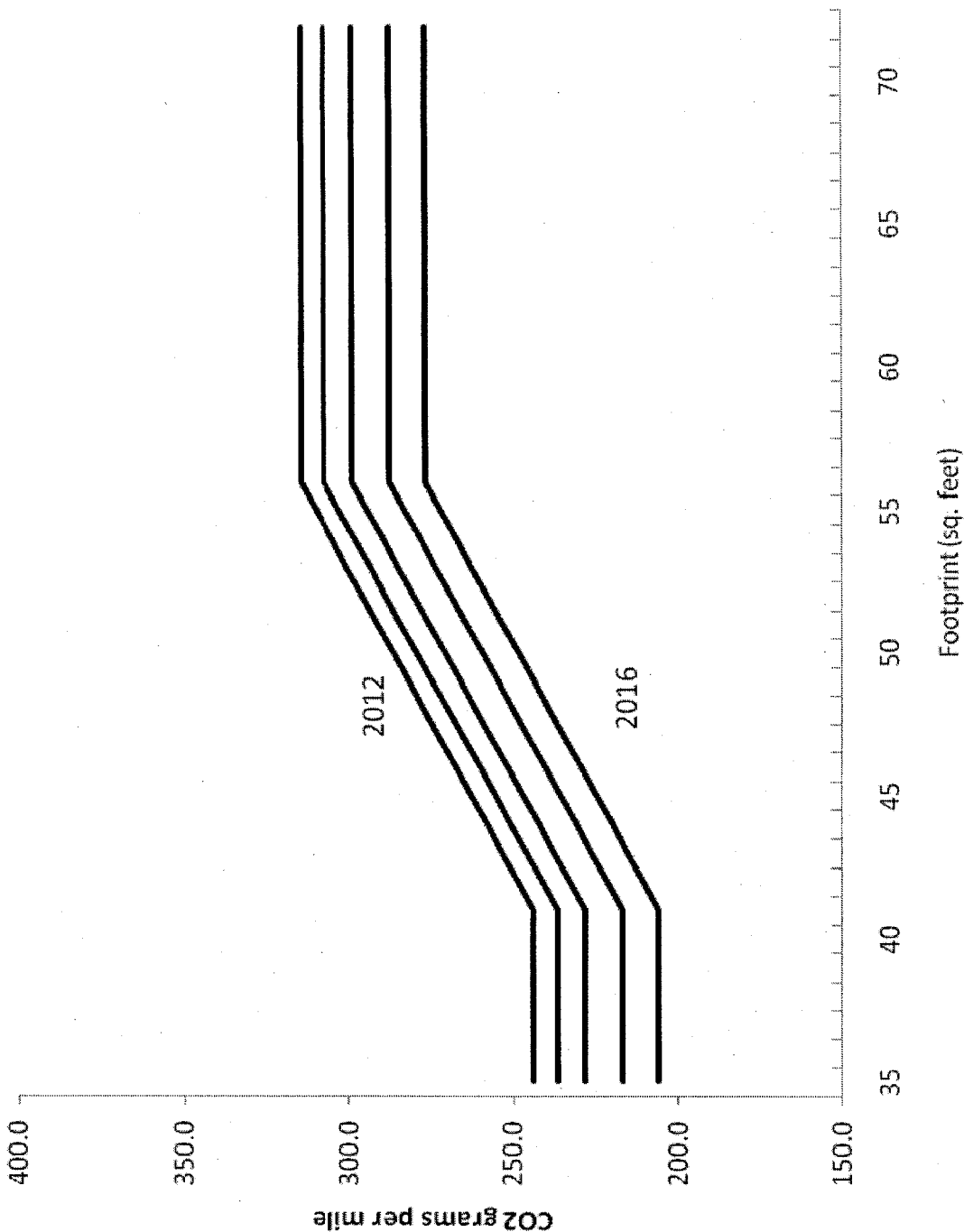


Figure I.B.3-3 CO₂ (g/mi) Car Standard Curves

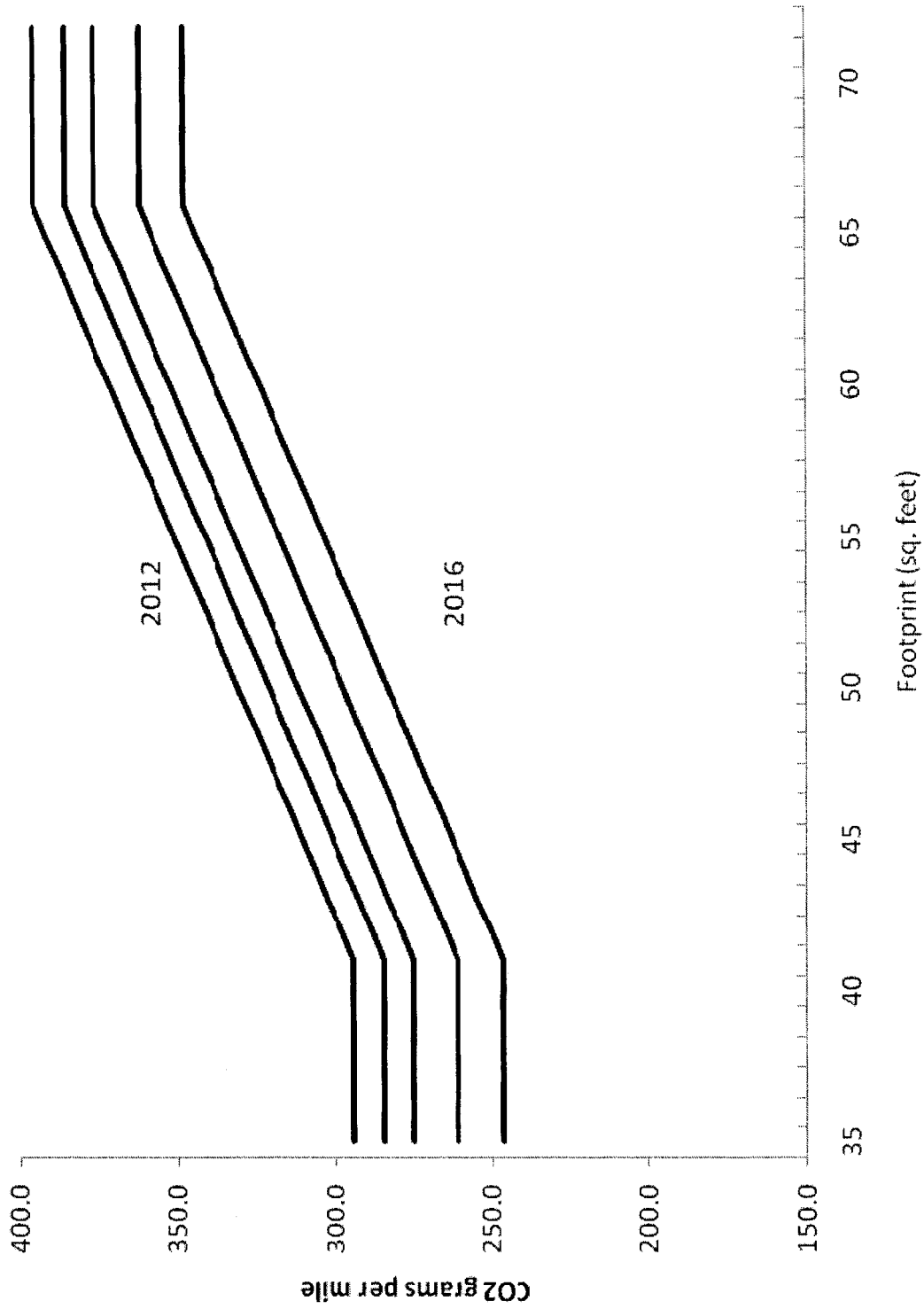


Figure I.B.3-4 CO₂ (g/mi) Truck Standard Curves

NHTSA and EPA received a number of comments about the shape of the car and truck curves. We address these comments further in Section II.C below as well as in Sections III and IV.

As proposed, NHTSA and EPA will use the same vehicle category definitions for determining which vehicles are subject to the car curve standards versus the truck curve standards. In other words, a vehicle classified as a car under the NHTSA CAFE program will also be classified as a car under the EPA GHG program, and likewise for trucks. Auto industry commenters generally agreed with this approach and believe it is an important aspect of harmonization across the two agencies' programs. Some other commenters expressed concern about potential consequences, especially in how cars and trucks are distinguished. However, EPA and NHTSA are employing the same car and truck definitions for the MY 2012–2016 CAFE

and GHG standards as those used in the CAFE program for the 2011 model year standards.³³ This issue is further discussed for the EPA standards in Section III, and for the NHTSA standards in Section IV. This approach of using CAFE definitions allows EPA's CO₂ standards and the CAFE standards to be harmonized across all vehicles for this program. However, EPA is not changing the car/truck definition for the purposes of any other previous rules.

Generally speaking, a smaller footprint vehicle will have higher fuel economy and lower CO₂ emissions relative to a larger footprint vehicle when both have the same degree of fuel efficiency improvement technology. In this final rule, the standards apply to a manufacturers overall fleet, not an individual vehicle, thus a manufacturers fleet which is dominated by small footprint vehicles will have a higher fuel economy requirement (lower CO₂ requirement) than a manufacturer

whose fleet is dominated by large footprint vehicles. A footprint-based CO₂ or CAFE standard can be relatively neutral with respect to vehicle size and consumer choice. All vehicles, whether smaller or larger, must make improvements to reduce CO₂ emissions or improve fuel economy, and therefore all vehicles will be relatively more expensive. With the footprint-based standard approach, EPA and NHTSA believe there should be no significant effect on the relative distribution of different vehicle sizes in the fleet, which means that consumers will still be able to purchase the size of vehicle that meets their needs. While targets are manufacturer specific, rather than vehicle specific, Table I.B.3–1 illustrates the fact that different vehicle sizes will have varying CO₂ emissions and fuel economy targets under the final standards.

TABLE I.B.3—1 MODEL YEAR 2016 CO₂ AND FUEL ECONOMY TARGETS FOR VARIOUS MY 2008 VEHICLE TYPES

Vehicle type	Example models	Example model footprint (sq. ft.)	CO ₂ emissions target (g/mi)	Fuel economy target (mpg)
Example Passenger Cars				
Compact car	Honda Fit	40	206	41.1
Midsized car	Ford Fusion	46	230	37.1
Fullsize car	Chrysler 300	53	263	32.6
Example Light-duty Trucks				
Small SUV	4WD Ford Escape	44	259	32.9
Midsized crossover	Nissan Murano	49	279	30.6
Minivan	Toyota Sienna	55	303	28.2
Large pickup truck	Chevy Silverado	67	348	24.7

4. Program Flexibilities

EPA's and NHTSA's programs as established in this rule provide compliance flexibility to manufacturers, especially in the early years of the National Program. This flexibility is expected to provide sufficient lead time for manufacturers to make necessary technological improvements and reduce the overall cost of the program, without compromising overall environmental and fuel economy objectives. The broad goal of harmonizing the two agencies' standards includes preserving manufacturers' flexibilities in meeting the standards, to the extent appropriate and required by law. The following section provides an overview of this final rule's flexibility provisions. Many auto manufacturers commented in support of these provisions as critical to meeting the standards in the lead time

provided. Environmental groups, some States, and others raised concerns about the possibility for windfall credits and loss of program benefits. The provisions in the final rule are in most cases the same as those proposed. However consideration of the issues raised by commenters has led to modifications in certain provisions. These comments and the agencies' response are discussed in Sections III and IV below and in the Response to Comments document.

a. CO₂/CAFE Credits Generated Based on Fleet Average Performance

Under this NHTSA and EPA final rule, the fleet average standards that apply to a manufacturer's car and truck fleets are based on the applicable footprint-based curves. At the end of each model year, when production of the model year is complete, a

production-weighted fleet average will be calculated for each averaging set (cars and trucks). Under this approach, a manufacturer's car and/or truck fleet that achieves a fleet average CO₂/CAFE level better than the standard can generate credits. Conversely, if the fleet average CO₂/CAFE level does not meet the standard, the fleet would incur debits (also referred to as a shortfall).

Under the final program, a manufacturer whose fleet generates credits in a given model year would have several options for using those credits, including credit carry-back, credit carry-forward, credit transfers, and credit trading. These provisions exist in the MY 2011 CAFE program under EPCA and EISA, and similar provisions are part of EPA's Tier 2 program for light-duty vehicle criteria pollutant emissions, as well as many

³³ 49 CFR 523.

other mobile source standards issued by EPA under the CAA. The manufacturer will be able to carry back credits to offset a deficit that had accrued in a prior model year and was subsequently carried over to the current model year. EPCA also provides for this. EPCA restricts the carry-back of CAFE credits to three years, and as proposed EPA is establishing the same limitation, in keeping with the goal of harmonizing both sets of standards.

After satisfying any need to offset pre-existing deficits, remaining credits can be saved (banked) for use in future years. Under the CAFE program, EISA allows manufacturers to apply credits earned in a model year to compliance in any of the five subsequent model years.³⁴ As proposed, under the GHG program, EPA is also allowing manufacturers to use these banked credits in the five years after the year in which they were generated (*i.e.*, five years carry-forward).

EISA required NHTSA to establish by regulation a CAFE credits transferring program, which NHTSA established in a March 2009 final rule codified at 49 CFR Part 536, to allow a manufacturer to transfer credits between its vehicle fleets to achieve compliance with the standards. For example, credits earned by over-compliance with a manufacturer's car fleet average standard could be used to offset debits incurred due to that manufacturer's not meeting the truck fleet average standard in a given year. EPA's Tier 2 program also provides for this type of credit transfer. As proposed for purposes of this rule, EPA allows unlimited credit transfers across a manufacturer's car-truck fleet to meet the GHG standard. This is based on the expectation that this flexibility will facilitate manufacturers' ability to comply with the GHG standards in the lead time provided, and will allow the required GHG emissions reductions to be achieved in the most cost effective way. Under the CAA, unlike under EISA, there is no statutory limitation on car-truck credit transfers. Therefore, EPA is not constraining car-truck credit transfers, as doing so would reduce the flexibility for lead time, and would increase costs with no corresponding environmental benefit. For the CAFE program, however, EISA limits the amount of credits that may be transferred, which has the effects of limiting the extent to which a manufacturer can rely upon credits in lieu of making fuel economy improvements to a particular portion of its vehicle fleet, but also of potentially

increasing the costs of improving the manufacturer's overall fleet. EISA also prohibits the use of transferred credits to meet the statutory minimum level for the domestic car fleet standard.³⁵ These and other statutory limits will continue to apply to the determination of compliance with the CAFE standards.

EISA also allowed NHTSA to establish by regulation a CAFE credit trading program, which NHTSA established in the March 2009 final rule at 40 CFR part 536, to allow credits to be traded (sold) to other vehicle manufacturers. As proposed, EPA allows credit trading in the GHG program. These sorts of exchanges are typically allowed under EPA's current mobile source emission credit programs, although manufacturers have seldom made such exchanges. Under the NHTSA CAFE program, EPCA also allows these types of credit trades, although, as with transferred credits, traded credits may not be used to meet the minimum domestic car standards specified by statute.³⁶ Comments discussing these provisions supported the proposed approach. These final provisions are the same as proposed.

As further discussed in Section IV of this preamble, NHTSA sought to find a way to provide credits for improving the efficiency of light truck air conditioners (A/Cs) and solicited public comments to that end. The agency did so because the power necessary to operate an A/C compressor places a significant additional load on the engine, thus reducing fuel economy and increasing CO₂ tailpipe emissions. *See* Section III.C.1 below. The agency would have made a similar effort regarding cars, but a 1975 statutory provision made it unfruitful even to explore the possibility of administratively proving such credits for cars. The agency did not identify a workable way of providing such credits for light trucks in the context of this rulemaking.

b. Air Conditioning Credits Under the EPA Final Rule

Air conditioning (A/C) systems contribute to GHG emissions in two ways. Hydrofluorocarbon (HFC) refrigerants, which are powerful GHGs, can leak from the A/C system (direct A/C emissions). As just noted, operation of the A/C system also places an additional load on the engine, which results in additional CO₂ tailpipe emissions (indirect A/C related emissions). EPA is allowing manufacturers to generate credits by reducing either or both types of GHG emissions related to A/C

systems. Specifically, EPA is establishing a method to calculate CO₂ equivalent reductions for the vehicle's full useful life on a grams/mile basis that can be used as credits in meeting the fleet average CO₂ standards. EPA's analysis indicates that this approach provides manufacturers with a highly cost-effective way to achieve a portion of GHG emissions reductions under the EPA program. EPA is estimating that manufacturers will on average generate 11 g/mi GHG credit toward meeting the 250 g/mi by 2016 (though some companies may generate more). EPA will also allow manufacturers to earn early A/C credits starting in MY 2009 through 2011, as discussed further in a later section. There were many comments on the proposed A/C provisions. Nearly every one of these was supportive of EPA including A/C control as part of this rule, though there was some disagreement on some of the details of the program. The HFC crediting scheme was widely supported. The comments mainly were concentrated on indirect A/C related credits. The auto manufacturers and suppliers had some technical comments on A/C technologies, and there were many concerns with the proposed idle test. EPA has made some minor adjustments in both of these areas that we believe are responsive to these concerns. EPA addresses A/C issues in greater detail in Section III of this preamble and in Chapter 2 of EPA's RIA.

c. Flexible-Fuel and Alternative Fuel Vehicle Credits

EPCA authorizes a compliance flexibility incentive under the CAFE program for production of dual-fueled or flexible-fuel vehicles (FFV) and dedicated alternative fuel vehicles. FFVs are vehicles that can run both on an alternative fuel and conventional fuel. Most FFVs are E85 capable vehicles, which can run on either gasoline or a mixture of up to 85 percent ethanol and 15 percent gasoline (E85). Dedicated alternative fuel vehicles are vehicles that run exclusively on an alternative fuel. EPCA was amended by EISA to extend the period of availability of the FFV incentive, but to begin phasing it out by annually reducing the amount of FFV incentive that can be used toward compliance with the CAFE standards.³⁷ Although NHTSA

³⁷ EPCA provides a statutory incentive for production of FFVs by specifying that their fuel economy is determined using a special calculation procedure that results in those vehicles being assigned a higher fuel economy level than would

Continued

³⁴ 49 U.S.C. 32903(a)(2).

³⁵ 49 U.S.C. 32903(g)(4).

³⁶ 49 U.S.C. 32903(f)(2).

expressed concern about the non-use of alternative fuel by FFVs in a 2002 report to Congress (Effects of the Alternative Motor Fuels Act CAFE Incentives Policy), EISA does not premise the availability of the FFV credits on actual use of alternative fuel by an FFV vehicle. Under NHTSA's CAFE program, pursuant to EISA, no FFV credits will be available for CAFE compliance after MY 2019.³⁸ For dedicated alternative fuel vehicles, there are no limits or phase-out of the credits. As required by the statute, NHTSA will continue to allow the use of FFV credits for purposes of compliance with the CAFE standards until the end of the EISA phase-out period.

For the GHG program, as proposed, EPA will allow FFV credits in line with EISA limits, but only during the period from MYs 2012 to 2015. After MY 2015, EPA will only allow FFV credits based on a manufacturer's demonstration that the alternative fuel is actually being used in the vehicles and based on the vehicle's actual performance. EPA discusses this in more detail in Section III.C of the preamble, including a summary of key comments. These provisions are being finalized as proposed, with further discussion in Section III.C of how manufacturers can demonstrate that the alternative fuel is being used.

d. Temporary Lead-Time Allowance Alternative Standards Under the EPA Final Rule

Manufacturers with limited product lines may be especially challenged in the early years of the National Program, and need additional lead time. Manufacturers with narrow product offerings may not be able to take full advantage of averaging or other program flexibilities due to the limited scope of the types of vehicles they sell. For example, some smaller volume manufacturer fleets consist entirely of vehicles with very high baseline CO₂ emissions. Their vehicles are above the CO₂ emissions target for that vehicle footprint, but do not have other types of vehicles in their production mix with which to average. Often, these manufacturers pay fines under the CAFE program rather than meet the applicable CAFE standard. EPA believes that these technological circumstances call for more lead time in the form of a more gradual phase-in of standards.

EPA is finalizing a temporary lead-time allowance for manufacturers that sell vehicles in the U.S. in MY 2009 and

for which U.S. vehicle sales in that model year are below 400,000 vehicles. This allowance will be available only during the MY 2012–2015 phase-in years of the program. A manufacturer that satisfies the threshold criteria will be able to treat a limited number of vehicles as a separate averaging fleet, which will be subject to a less stringent GHG standard.³⁹ Specifically, a standard of 25 percent above the vehicle's otherwise applicable foot-print target level will apply to up to 100,000 vehicles total, spread over the four year period of MY 2012 through 2015. Thus, the number of vehicles to which the flexibility could apply is limited. EPA also is setting appropriate restrictions on credit use for these vehicles, as discussed further in Section III. By MY 2016, these allowance vehicles must be averaged into the manufacturer's full fleet (*i.e.*, they will no longer be eligible for a different standard). EPA discusses this in more detail in Section III.B of the preamble.

EPA received comments from several smaller manufacturers that the TLAAS program was insufficient to allow manufacturers with very limited product lines to comply. These manufacturers commented that they need additional lead time to meet the standards, because their CO₂ baselines are significantly higher and their vehicle product lines are even more limited, reducing their ability to average across their fleets compared even to other TLAAS manufacturers. EPA fully summarizes the public comments on the TLAAS program, including comments not supporting the program, in Section III.B. In summary, in response to the lead time issues raised by manufacturers, EPA is modifying the TLAAS program that applies to manufacturers with between 5,000 and 50,000 U.S. vehicle sales in MY 2009. EPA believes these provisions are necessary given that, compared with other TLAAS manufacturers, these manufacturers have even more limited product offerings across which to average and higher baseline CO₂ emissions, and thus need additional lead-time to meet the standards. These manufacturers would have an increased allotment of vehicles, a total of 250,000, compared to 100,000 vehicles (for other TLAAS-eligible manufacturers). In addition, the TLAAS program for these manufacturers would be extended by one year, through MY 2016 for these

vehicles, for a total of five years of eligibility. The other provisions of the TLAAS program would continue to apply, such as the restrictions on credit trading and the level of the standard. Additional restrictions would also apply to these vehicles, as discussed in Section III. In addition, for the smallest volume manufacturers, those with below 5,000 U.S. vehicle sales, EPA is not setting standards at this time but is instead deferring standards until a future rulemaking. This is essentially the same approach we are using for small businesses, which are exempted from this rule. The unique issues involved with these manufacturers will be addressed in that future rulemaking. Further discussion of the public comment on these issues and details on these changes from the proposed program are included in Section III.

e. Additional Credit Opportunities Under the Clean Air Act (CAA)

EPA is establishing additional opportunities for early credits in MYs 2009–2011 through over-compliance with a baseline standard. The baseline standard is set to be equivalent, on a national level, to the California standards. Credits can be generated by over-compliance with this baseline in one of two ways—over-compliance by the fleet of vehicles sold in California and the CAA section 177 States (*i.e.*, those States adopting the California program), or over-compliance with the fleet of vehicles sold in the 50 States. EPA is also providing for early credits based on over-compliance with CAFE, but only for vehicles sold in States outside of California and the CAA section 177 states. Under the early credit provisions, no early FFV credits would be allowed, except those achieved by over-compliance with the California program based on California's provisions that manufacturers demonstrate actual use of the alternative fuel. EPA's early credits provisions are designed to ensure that there would be no double counting of early credits. NHTSA notes, however, that credits for overcompliance with CAFE standards during MYs 2009–2011 will still be available for manufacturers to use toward compliance in future model years, just as before.

EPA received comments from some environmental organizations and States expressing concern that these early credits were inappropriate windfall credits because they provided credits for actions that were not surplus, that is above what would otherwise be required for compliance with either State or Federal motor vehicle standards. This focused on the credits

otherwise occur. This is typically referred to as an FFV credit.

³⁸ *Id.*

³⁹ EPCA does not permit such an allowance. Consequently, manufacturers who may be able to take advantage of a lead-time allowance under the GHG standards would be required to comply with the applicable CAFE standard or be subject to penalties for non-compliance.

for over-compliance with the California standards generated during model years 2009 and perhaps 2010, where according to commenters the CAFE requirements were in effect more stringent than the California standards. EPA believes that early credits provide a valuable incentive for manufacturers that have implemented fuel efficient technologies in excess of their CAFE compliance obligations prior to MY 2012. With appropriate restrictions, these credits, reflecting over-compliance over a three model year time frame (MY 2009–2011) and not just over one or two model years, will be surplus reductions and not otherwise required by law. Therefore, EPA is finalizing these provisions largely as proposed, but in response to comments, with an additional restriction on the trading of MY 2009 credits. The overall structure of this early credit program addresses concerns about the potential for windfall credits in the first one or two model years. This issue is fully discussed in Section III.C.

EPA is providing an additional temporary incentive to encourage the commercialization of advanced GHG/fuel economy control technologies—including electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCVs)—for model years 2012–2016. EPA's proposal included an emissions compliance value of zero grams/mile for EVs and FCVs, and the electric portion of PHEVs, and a multiplier in the range of 1.2 to 2.0, so that each advanced technology vehicle would count as greater than one vehicle in a manufacturer's fleetwide compliance calculation. EPA received many comments on the proposed incentives. Many State and environmental organization commenters believed that the combination of these incentives could undermine the GHG benefits of the rule, and believed the emissions compliance values should take into account the net upstream GHG emissions associated with electrified vehicles compared to vehicles powered by petroleum based fuel. Auto manufacturers generally supported the incentives, some believing the incentives to be a critical part of the National Program. Most auto makers supported both the zero grams/mile emissions compliance value and the higher multipliers.

Upon considering the public comments on this issue, EPA is finalizing an advanced technology vehicle incentive program that includes a zero gram/mile emissions compliance value for EVs and FCVs, and the electric portion of PHEVs, for up to the first 200,000 EV/PHEV/FCV vehicles

produced by a given manufacturer during MY 2012–2016 (for a manufacturer that produces less than 25,000 EVs, PHEVs, and FCVs in MY 2012), or for up to the first 300,000 EV/PHEV/FCV vehicles produced during MY 2012–2016 (for a manufacturer that produces 25,000 or more EVs, PHEVs, and FCVs in MY 2012). For any production greater than this amount, the compliance value for the vehicle will be greater than zero gram/mile, set at a level that reflects the vehicle's net increase in upstream GHG emissions in comparison to the gasoline vehicle it replaces. In addition, EPA is not finalizing a multiplier. EPA will also allow this early advanced technology incentive program beginning in MYs 2009–2011. The purpose of these provisions is to provide a temporary incentive to promote technologies which have the potential to produce very large GHG reductions in the future. The tailpipe GHG emissions from EVs, FCVs, and PHEVs operated on grid electricity are zero, and traditionally the emissions of the vehicle itself are all that EPA takes into account for purposes of compliance with standards set under section 202(a). This has not raised any issues for criteria pollutants, as upstream emissions associated with production and distribution of the fuel are addressed by comprehensive regulatory programs focused on the upstream sources of those emissions. At this time, however, there is no such comprehensive program addressing upstream emissions of GHGs, and the upstream GHG emissions associated with production and distribution of electricity are higher than the corresponding upstream GHG emissions of gasoline or other petroleum based fuels. In the future, vehicle fleet electrification combined with advances in low-carbon technology in the electricity sector have the potential to transform the transportation sector's contribution to the country's GHG emissions. EPA will reassess the issue of how to address EVs, PHEVs, and FCVs in rulemakings for model years 2017 and beyond, based on the status of advanced vehicle technology commercialization, the status of upstream GHG control programs, and other relevant factors. Further discussion of the temporary advanced technology vehicle incentives, including more detail on the public comments and EPA's response, is found in Section III.C.

EPA is also providing an option for manufacturers to generate credits for employing new and innovative technologies that achieve GHG

reductions that are not reflected on current test procedures, as proposed. Examples of such "off-cycle" technologies might include solar panels on hybrids, adaptive cruise control, and active aerodynamics, among other technologies. These three credit provisions are discussed in more detail in Section III.

5. Coordinated Compliance

Previous NHTSA and EPA regulations and statutory provisions establish ample examples on which to develop an effective compliance program that achieves the energy and environmental benefits from CAFE and motor vehicle GHG standards. NHTSA and EPA have developed a program that recognizes, and replicates as closely as possible, the compliance protocols associated with the existing CAA Tier 2 vehicle emission standards, and with CAFE standards. The certification, testing, reporting, and associated compliance activities closely track current practices and are thus familiar to manufacturers. EPA already oversees testing, collects and processes test data, and performs calculations to determine compliance with both CAFE and CAA standards. Under this coordinated approach, the compliance mechanisms for both programs are consistent and non-duplicative. EPA will also apply the CAA authorities applicable to its separate in-use requirements in this program.

The compliance approach allows manufacturers to satisfy the new program requirements in the same general way they comply with existing applicable CAA and CAFE requirements. Manufacturers would demonstrate compliance on a fleet-average basis at the end of each model year, allowing model-level testing to continue throughout the year as is the current practice for CAFE determinations. The compliance program design establishes a single set of manufacturer reporting requirements and relies on a single set of underlying data. This approach still allows each agency to assess compliance with its respective program under its respective statutory authority.

NHTSA and EPA do not anticipate any significant noncompliance under the National Program. However, failure to meet the fleet average standards (after credit opportunities are exhausted) would ultimately result in the potential for penalties under both EPCA and the CAA. The CAA allows EPA considerable discretion in assessment of penalties. Penalties under the CAA are typically determined on a vehicle-specific basis by determining the

number of a manufacturer's highest emitting vehicles that caused the fleet average standard violation. This is the same mechanism used for EPA's National Low Emission Vehicle and Tier 2 corporate average standards, and to date there have been no instances of noncompliance. CAFE penalties are specified by EPCA and would be assessed for the entire noncomplying fleet at a rate of \$5.50 times the number of vehicles in the fleet, times the number of tenths of mpg by which the fleet average falls below the standard. In the event of a compliance action arising out of the same facts and circumstances, EPA could consider CAFE penalties when determining appropriate remedies for the EPA case.

Several stakeholders commented on the proposed coordinated compliance approach. The comments indicated broad support for the overall approach EPA proposed. In particular, both regulated industry and the public interest community appreciated the attempt to streamline compliance by adopting current practice where possible and by coordinating EPA and NHTSA compliance requirements. Thus the final compliance program design is largely unchanged from the proposal. Some commenters requested additional detail or clarification in certain areas and others suggested some relatively narrow technical changes, and EPA has responded to these suggestions. EPA and NHTSA summarize these comments and the agencies' responses in Sections III and IV, respectively, below. The Response to Comments document associated with this document includes all of the comments and responses received during the comment period.

C. Summary of Costs and Benefits of the National Program

This section summarizes the projected costs and benefits of the CAFE and GHG emissions standards. These projections helped inform the agencies' choices among the alternatives considered and provide further confirmation that the final standards are an appropriate choice within the spectrum of choices allowable under their respective statutory criteria. The costs and benefits projected by NHTSA to result from these CAFE standards are presented first, followed by those from EPA's analysis of the GHG emissions standards.

For several reasons, the estimates for costs and benefits presented by NHTSA and EPA, while consistent, are not directly comparable, and thus should not be expected to be identical. Most important, NHTSA and EPA's standards would require slightly different fuel

efficiency improvements. EPA's GHG standard is more stringent in part due to its assumptions about manufacturers' use of air conditioning credits, which result from reductions in air conditioning-related emissions of HFCs and CO₂. NHTSA was unable to make assumptions about manufacturers' improving the efficiency of air conditioners due to statutory limitations. In addition, the CAFE and GHG standards offer different program flexibilities, and the agencies' analyses differ in their accounting for these flexibilities (for example, FFVs), primarily because NHTSA is statutorily prohibited from considering some flexibilities when establishing CAFE standards, while EPA is not. These differences contribute to differences in the agencies' respective estimates of costs and benefits resulting from the new standards.

NHTSA performed two analyses: a primary analysis that shows the estimates of costs, fuel savings, and related benefits that the agency considered for purposes of establishing new CAFE standards, and a supplemental analysis that reflects the agency's best estimate of the potential real-world effects of the CAFE standards, including manufacturers' potential use of FFV credits in accordance with the provisions of EISA concerning their availability. Because EPCA prohibits NHTSA from considering the ability of manufacturers to use of FFV credits to increase their fleet average fuel economy when *establishing* CAFE standards, the agency's primary analysis does not include them. However, EPCA does not prohibit NHTSA from considering the fact that manufacturers may pay civil penalties rather than complying with CAFE standards, and NHTSA's primary analysis accounts for some manufacturers' tendency to do so. In addition, NHTSA's supplemental analysis of the effect of FFV credits on benefits and costs from its CAFE standards, demonstrates the real-world impacts of FFVs, and the summary estimates presented in Section IV include these effects. Including the use of FFV credits reduces estimated per-vehicle compliance costs of the program. However, as shown below, including FFV credits does not significantly change the projected fuel savings and CO₂ reductions, because FFV credits reduce the fuel economy levels that manufacturers achieve not only under the standards, but also under the baseline MY 2011 CAFE standards.

Also, EPCA, as amended by EISA, allows manufacturers to transfer credits between their passenger car and light

truck fleets. However, EPCA also prohibits NHTSA from considering manufacturers' ability to increase their average fuel economy through the use of CAFE credits when determining the stringency of the CAFE standards. Because of this prohibition, NHTSA's primary analysis does not account for the extent to which credit transfers might actually occur. For purposes of its supplemental analysis, NHTSA considered accounting for the possibility that some manufacturers might utilize the opportunity under EPCA to transfer some CAFE credits between the passenger car and light truck fleets, but determined that in NHTSA's year-by-year analysis, manufacturers' credit transfers cannot be reasonably estimated at this time.⁴⁰

EPA made explicit assumptions about manufacturers' use of FFV credits under both the baseline and control alternatives, and its estimates of costs and benefits from the GHG standards reflect these assumptions. However, under the GHG standards, FFV credits would be available through MY 2015; starting in MY 2016, EPA will only allow FFV credits based on a manufacturer's demonstration that the alternative fuel is actually being used in the vehicles and the actual GHG performance for the vehicle run on that alternative fuel.

EPA's analysis also assumes that manufacturers would transfer credits between their car and truck fleets in the MY 2011 baseline subject to the maximum value allowed by EPCA, and that unlimited car-truck credit transfers would occur under the GHG standards. Including these assumptions in EPA's analysis increases the resulting estimates of fuel savings and reductions in GHG emissions, while reducing EPA's estimates of program compliance costs.

Finally, under the EPA GHG program, there is no ability for a manufacturer to intentionally pay fines in lieu of meeting the standard. Under EPCA, however, vehicle manufacturers are allowed to pay fines as an alternative to compliance with applicable CAFE standards. NHTSA's analysis explicitly estimates the level of voluntary fine payment by individual manufacturers, which reduces NHTSA's estimates of

⁴⁰ NHTSA's analysis estimates multi-year planning effects within a context in which each model year is represented explicitly, and technologies applied in one model year carry forward to future model years. NHTSA does not currently have a reasonable basis to estimate how a manufacturer might, for example, weigh the transfer of credits from the passenger car to the light truck fleet in MY 2013 against the potential to carry light truck technologies forward from MY 2013 through MY 2016.

both the costs and benefits of its CAFE standards. In contrast, the CAA does not allow for fine payment (civil penalties) in lieu of compliance with emission standards, and EPA's analysis of benefits from its standard thus assumes full compliance. This assumption results in higher estimates of fuel savings, of reductions in GHG emissions, and of manufacturers' compliance costs to sell fleets that comply with both NHTSA's CAFE program and EPA's GHG program.

In summary, the projected costs and benefits presented by NHTSA and EPA are not directly comparable, because the GHG emission levels established by EPA include air conditioning-related improvements in equivalent fuel efficiency and HFC reductions, because of the assumptions incorporated in EPA's analysis regarding car-truck credit transfers, and because of EPA's projection of complete compliance with the GHG standards. It should also be expected that overall, EPA's estimates of GHG reductions and fuel savings achieved by the GHG standards will be slightly higher than those projected by NHTSA only for the CAFE standards because of the reasons described above. For the same reasons, EPA's estimates of manufacturers' costs for complying with the passenger car and light trucks GHG standards are slightly higher than NHTSA's estimates for complying with the CAFE standards.

A number of stakeholders commented on NHTSA's and EPA's analytical assumptions in estimating costs and benefits of the program. These comments and any changes from the proposed values are summarized in Section II.F, and further in Sections III

(for EPA) and IV (for NHTSA); the Response to Comments document presents the detailed responses to each of the comments.

1. Summary of Costs and Benefits of NHTSA's CAFE Standards

NHTSA has analyzed in detail the costs and benefits of the final CAFE standards. Table I.C.1-1 presents the total costs, benefits, and net benefits for NHTSA's final CAFE standards. The values in Table I.C.1-1 display the total costs for all MY 2012-2016 vehicles and the benefits and net benefits represent the impacts of the standards over the full lifetime of the vehicles projected to be sold during model years 2012-2016. It is important to note that there is significant overlap in costs and benefits for NHTSA's CAFE program and EPA's GHG program and therefore combined program costs and benefits, which together comprise the National Program, are not a sum of the two individual programs.

TABLE I.C.1-1—NHTSA'S ESTIMATED 2012-2016 MODEL YEAR COSTS, BENEFITS, AND NET BENEFITS UNDER THE CAFE STANDARDS BEFORE FFV CREDITS

[2007 dollars]

3% Discount Rate:	\$billions
Costs	51.8
Benefits	182.5
Net Benefits	130.7
7% Discount Rate:	
Costs	51.8
Benefits	146.3
Net Benefits	94.5

NHTSA estimates that these new CAFE standards will lead to fuel savings totaling 61 billion gallons throughout the useful lives of vehicles sold in MYs 2012-2016. At a 3% discount rate, the present value of the economic benefits resulting from those fuel savings is \$143 billion. At a 7% discount rate, the present value of the economic benefits resulting from those fuel savings is \$112 billion.⁴¹

The agency further estimates that these new CAFE standards will lead to corresponding reductions in CO₂ emissions totaling 655 million metric tons (mmt) during the useful lives of vehicles sold in MYs 2012-2016. The present value of the economic benefits from avoiding those emissions is \$14.5 billion, based on a global social cost of carbon value of approximately \$21 per metric ton (in 2010, and growing thereafter).⁴² It is important to note that NHTSA's CAFE standards and EPA's GHG standards will both be in effect, and each will lead to increases in average fuel economy and CO₂ emissions reductions. The two agencies' standards together comprise the National Program, and this discussion of costs and benefits of NHTSA's CAFE standards does not change the fact that both the CAFE and GHG standards, jointly, are the source of the benefits and costs of the National Program.

TABLE I.C.1-2—NHTSA FUEL SAVED (BILLION GALLONS) AND CO₂ EMISSIONS AVOIDED (mmt) UNDER CAFE STANDARDS (WITHOUT FFV CREDITS)

	2012	2013	2014	2015	2016	Total
Fuel (b. gal.)	4.2	8.9	12.5	16.0	19.5	61.0
CO ₂ (mmt)	44	94	134	172	210	655

Considering manufacturers' ability to earn credit toward compliance by selling FFVs, NHTSA estimates very

little change in incremental fuel savings and avoided CO₂ emissions, assuming

FFV credits would be used toward both the baseline and final standards:

TABLE I.C.1-3—NHTSA FUEL SAVED (BILLION GALLONS) AND CO₂ EMISSIONS AVOIDED (MILLION METRIC TONS, MMT) UNDER CAFE STANDARDS (WITH FFV CREDITS)

	2012	2013	2014	2015	2016	Total
Fuel (b. gal.)	4.9	8.2	11.3	15.0	19.1	58.6

⁴¹ These figures do not account for the compliance flexibilities that NHTSA is prohibited from considering when determining the level of

new CAFE standards, because manufacturers' decisions to use those flexibilities are voluntary.

⁴² NHTSA also estimated the benefits associated with three more estimates of a one ton GHG

reduction in 2010 (\$5, \$35, and \$65), which will likewise grow thereafter. See Section II for a more detailed discussion of the social cost of carbon.

TABLE I.C.1-3—NHTSA FUEL SAVED (BILLION GALLONS) AND CO₂ EMISSIONS AVOIDED (MILLION METRIC TONS, MMT) UNDER CAFE STANDARDS (WITH FFV CREDITS)—Continued

	2012	2013	2014	2015	2016	Total
CO ₂ (mmt)	53	89	123	163	208	636

NHTSA estimates that these fuel economy increases would produce other benefits both to drivers (*e.g.*, reduced time spent refueling) and to the U.S. (*e.g.*, reductions in the costs of petroleum imports *beyond* the direct savings from reduced oil purchases, as well as some disbenefits (*e.g.*, increase traffic congestion) caused by drivers' tendency to travel more when the cost

of driving declines (as it does when fuel economy increases). NHTSA has estimated the total monetary value to society of these benefits and disbenefits, and estimates that the standards will produce significant net benefits to society. Using a 3% discount rate, NHTSA estimates that the present value of these benefits would total more than \$180 billion over the useful lives of

vehicles sold during MYs 2012–2016. More discussion regarding monetized benefits can be found in Section IV of this notice and in NHTSA's Regulatory Impact Analysis. Note that the benefit calculation in Tables I.C.1-4 through 1-7 includes the benefits of reducing CO₂ emissions,⁴³ but not the benefits of reducing other GHG emissions.

TABLE I.C.1-4—NHTSA DISCOUNTED BENEFITS (\$BILLION) UNDER THE CAFE STANDARDS (BEFORE FFV CREDITS, USING 3 PERCENT DISCOUNT RATE)

	2012	2013	2014	2015	2016	Total
Passenger Cars	6.8	15.2	21.6	28.7	35.2	107.5
Light Trucks	5.1	10.7	15.5	19.4	24.3	75.0
Combined	11.9	25.8	37.1	48.0	59.5	182.5

Using a 7% discount rate, NHTSA estimates that the present value of these

benefits would total more than \$145 billion over the same time period.

TABLE I.C.1-5—NHTSA DISCOUNTED BENEFITS (\$BILLION) UNDER THE CAFE STANDARDS (BEFORE FFV CREDITS, USING 7 PERCENT DISCOUNT RATE)

	2012	2013	2014	2015	2016	Total
Passenger Cars	5.5	12.3	17.5	23.2	28.6	87.0
Light Trucks	4.0	8.4	12.2	15.3	19.2	59.2
Combined	9.5	20.7	29.7	38.5	47.8	146.2

NHTSA estimates that FFV credits could reduce achieved benefits by about 3.8%:

TABLE I.C.1-6A—NHTSA DISCOUNTED BENEFITS (\$BILLION) UNDER THE CAFE STANDARDS (WITH FFV CREDITS, USING A 3 PERCENT DISCOUNT RATE)

	2012	2013	2014	2015	2016	Total
Passenger Cars	7.6	13.7	19.1	25.6	34.0	100.0
Light Trucks	6.4	10.4	14.6	19.8	24.4	75.6
Combined	14.0	24.1	33.7	45.4	58.4	175.6

TABLE I.C.1-6B—NHTSA DISCOUNTED BENEFITS (\$BILLION) UNDER THE CAFE STANDARDS (WITH FFV CREDITS, USING A 7 PERCENT DISCOUNT RATE)

	2012	2013	2014	2015	2016	Total
Passenger Cars	6.1	11.1	15.5	20.7	27.6	80.9
Light Trucks	5.0	8.2	11.5	15.6	19.3	59.7

⁴³ CO₂ benefits for purposes of these tables are calculated using the \$21/ton SCC values. Note that net present value of reduced GHG emissions is

calculated differently than other benefits. The same discount rate used to discount the value of damages from future emissions (SCC at 5, 3, and 2.5 percent)

is used to calculate net present value of SCC for internal consistency.

TABLE I.C.1-6B—NHTSA DISCOUNTED BENEFITS (\$BILLION) UNDER THE CAFE STANDARDS (WITH FFV CREDITS, USING A 7 PERCENT DISCOUNT RATE)—Continued

	2012	2013	2014	2015	2016	Total
Combined	11.2	19.3	27.0	36.4	46.9	140.7

NHTSA attributes most of these benefits—about \$143 billion (at a 3% discount rate and excluding consideration of FFV credits), as noted above—to reductions in fuel

consumption, valuing fuel (for societal purposes) at the future pre-tax prices projected in the Energy Information Administration's (AEO's) reference case forecast from the Annual Energy

Outlook (AEO) 2010 Early Release. NHTSA's Final Regulatory Impact Analysis (FRIA) accompanying this rule presents a detailed analysis of specific benefits of the rule.

TABLE I.C.1-7—SUMMARY OF BENEFITS FUEL SAVINGS AND CO₂ EMISSIONS REDUCTION DUE TO THE RULE (BEFORE FFV CREDITS)

	Amount	Monetized value (discounted)	
		3% discount rate	7% discount rate
Fuel savings	61.0 billion gallons	\$143.0 billion	\$112.0 billion.
CO ₂ emissions reductions	655 mmt	\$14.5 billion	\$14.5 billion.

NHTSA estimates that the increases in technology application necessary to achieve the projected improvements in fuel economy will entail considerable

monetary outlays. The agency estimates that incremental costs for achieving its standards—that is, outlays by vehicle manufacturers over and above those

required to comply with the MY 2011 CAFE standards—will total about \$52 billion (*i.e.*, during MYs 2012–2016).

TABLE I.C.1-8—NHTSA INCREMENTAL TECHNOLOGY OUTLAYS (\$BILLION) UNDER THE CAFE STANDARDS (BEFORE FFV CREDITS)

	2012	2013	2014	2015	2016	Total
Passenger Cars	4.1	5.4	6.9	8.2	9.5	34.2
Light Trucks	1.8	2.5	3.7	4.3	5.4	17.6
Combined	5.9	7.9	10.5	12.5	14.9	51.7

NHTSA estimates that use of FFV credits could significantly reduce these outlays:

TABLE I.C.1-9—NHTSA INCREMENTAL TECHNOLOGY OUTLAYS (\$BILLION) UNDER CAFE STANDARDS (WITH FFV CREDITS)

	2012	2013	2014	2015	2016	Total
Passenger Cars	2.6	3.6	4.8	6.1	7.5	24.6
Light Trucks	1.1	1.5	2.5	3.4	4.4	12.9
Combined	3.7	5.1	7.3	9.5	11.9	37.5

The agency projects that manufacturers will recover most or all of these additional costs through higher selling prices for new cars and light trucks. To allow manufacturers to

recover these increased outlays (and, to a much lesser extent, the civil penalties that some companies are expected to pay for noncompliance), the agency estimates that the standards would lead

to increases in average new vehicle prices ranging from \$457 per vehicle in MY 2012 to \$985 per vehicle in MY 2016:

TABLE I.C.1-10—NHTSA INCREMENTAL INCREASES IN AVERAGE NEW VEHICLE COSTS (\$) UNDER CAFE STANDARDS (BEFORE FFV CREDITS)

	2012	2013	2014	2015	2016
Passenger Cars	505	573	690	799	907
Light Trucks	322	416	621	752	961

TABLE I.C.1–10—NHTSA INCREMENTAL INCREASES IN AVERAGE NEW VEHICLE COSTS (\$) UNDER CAFE STANDARDS (BEFORE FFV CREDITS)—Continued

	2012	2013	2014	2015	2016
Combined	434	513	665	782	926

NHTSA estimates that use of FFV credits could significantly reduce these costs, especially in earlier model years:

TABLE I.C.1–11—NHTSA INCREMENTAL INCREASES IN AVERAGE NEW VEHICLE COSTS (\$) UNDER CAFE STANDARDS (WITH FFV CREDITS)

	2012	2013	2014	2015	2016
Passenger Cars	303	378	481	593	713
Light Trucks	194	260	419	581	784
Combined	261	333	458	589	737

NHTSA estimates, therefore, that the total benefits of these CAFE standards will be more than three times the magnitude of the corresponding costs. As a consequence, its standards would produce net benefits of \$130.7 billion at a 3 percent discount rate (with FFV credits, \$138.2 billion) or \$94.5 billion at a 7 percent discount rate over the useful lives of vehicles sold during MYs 2012–2016.

2. Summary of Costs and Benefits of EPA's GHG Standards

EPA has analyzed in detail the costs and benefits of the final GHG standards. Table I.C.2–1 shows EPA's estimated lifetime discounted cost, benefits and net benefits for all vehicles projected to be sold in model years 2012–2016. It is important to note that there is significant overlap in costs and benefits for NHTSA's CAFE program and EPA's GHG program and therefore combined program costs and benefits are not a sum of the individual programs.

TABLE I.C.2–1—EPA'S ESTIMATED 2012–2016 MODEL YEAR LIFETIME DISCOUNTED COSTS, BENEFITS, AND NET BENEFITS ASSUMING THE \$21/TON SCC VALUE^{a b c d}

[2007 dollars]

3% Discount rate	\$Billions
Costs	51.5
Benefits	240

TABLE I.C.2–1—EPA'S ESTIMATED 2012–2016 MODEL YEAR LIFETIME DISCOUNTED COSTS, BENEFITS, AND NET BENEFITS ASSUMING THE \$21/TON SCC VALUE^{a b c d}—Continued
[2007 dollars]

3% Discount rate	\$Billions
Net Benefits	189
7% Discount rate	
Costs	51.5
Benefits	192
Net Benefits	140

^a Although EPA estimated the benefits associated with four different values of a one ton GHG reduction (\$5, \$21, \$35, \$65), for the purposes of this overview presentation of estimated costs and benefits EPA is showing the benefits associated with the marginal value deemed to be central by the interagency working group on this topic: \$21 per ton of CO₂e, in 2007 dollars and 2010 emissions. The \$21/ton value applies to 2010 CO₂ emissions and grows over time.

^b As noted in Section III.H, SCC increases over time. The \$21/ton value applies to 2010 CO₂ emissions and grows larger over time.

^c Note that net present value of reduced GHG emissions is calculated differently than other benefits. The same discount rate used to discount the value of damages from future emissions (SCC at 5, 3, and 2.5 percent) is used to calculate net present value of SCC for internal consistency. Refer to Section III.H for more detail.

^d Monetized GHG benefits exclude the value of reductions in non-CO₂ GHG emissions (HFC, CH₄ and N₂O) expected under this final rule. Although EPA has not monetized the benefits of reductions in these non-CO₂ emissions, the value of these reductions should not be interpreted as zero. Rather, the reductions in non-CO₂ GHGs will contribute to this rule's climate benefits, as explained in Section III.F.2. The SCC TSD notes the difference between the social cost of non-CO₂ emissions and CO₂ emissions, and specifies a goal to develop methods to value non-CO₂ emissions in future analyses.

Table I.C.2–2 shows EPA's estimated lifetime fuel savings and CO₂ equivalent emission reductions for all vehicles sold in the model years 2012–2016. The values in Table I.C.2–2 are projected lifetime totals for each model year and are not discounted. As documented in EPA's Final RIA, the potential credit transfer between cars and trucks may change the distribution of the fuel savings and GHG emission impacts between cars and trucks. As discussed above with respect to NHTSA's CAFE standards, it is important to note that NHTSA's CAFE standards and EPA's GHG standards will both be in effect, and each will lead to increases in average fuel economy and reductions in CO₂ emissions. The two agencies' standards together comprise the National Program, and this discussion of costs and benefits of EPA's GHG standards does not change the fact that both the CAFE and GHG standards, jointly, are the source of the benefits and costs of the National Program.

TABLE I.C.2–2—EPA'S ESTIMATED 2012–2016 MODEL YEAR LIFETIME FUEL SAVED AND GHG EMISSIONS AVOIDED

		2012	2013	2014	2015	2016	Total
Cars	Fuel (billion gallons)	4.0	5.5	7.3	10.5	14.3	41.6
	Fuel (billion barrels)	0.10	0.13	0.17	0.25	0.34	0.99
	CO ₂ EQ (mmt)	49.3	68.5	92.7	134	177	521

TABLE I.C.2-2—EPA'S ESTIMATED 2012-2016 MODEL YEAR LIFETIME FUEL SAVED AND GHG EMISSIONS AVOIDED—
Continued

		2012	2013	2014	2015	2016	Total
Light Trucks	Fuel (billion gallons)	3.3	5.0	6.6	9.0	12.2	36.1
	Fuel (billion barrels)	0.08	0.12	0.16	0.21	0.29	0.86
	CO ₂ EQ (mmt)	39.6	61.7	81.6	111	147	441
Combined ..	Fuel (billion gallons)	7.3	10.5	13.9	19.5	26.5	77.7
	Fuel (billion barrels)	0.17	0.25	0.33	0.46	0.63	1.85
	CO ₂ EQ (mmt)	88.8	130	174	244	325	962

Table I.C.2-3 shows EPA's estimated lifetime discounted benefits for all vehicles sold in model years 2012-2016. Although EPA estimated the benefits associated with four different values of a one ton GHG reduction (\$5, \$21, \$35, \$65), for the purposes of this overview presentation of estimated benefits EPA is showing the benefits associated with one of these marginal values, \$21 per ton of CO₂, in 2007 dollars and 2010 emissions. Table I.C.2-3 presents benefits based on the \$21 value. Section

III.H presents the four marginal values used to estimate monetized benefits of GHG reductions and Section III.H presents the program benefits using each of the four marginal values, which represent only a partial accounting of total benefits due to omitted climate change impacts and other factors that are not readily monetized. The values in the table are discounted values for each model year of vehicles throughout their projected lifetimes. The benefits include all benefits considered by EPA such as

fuel savings, GHG reductions, PM benefits, energy security and other externalities such as reduced refueling and accidents, congestion and noise. The lifetime discounted benefits are shown for one of four different social cost of carbon (SCC) values considered by EPA. The values in Table I.C.2-3 do not include costs associated with new technology required to meet the GHG standard.

TABLE I.C.2-3—EPA'S ESTIMATED 2012-2016 MODEL YEAR LIFETIME DISCOUNTED BENEFITS ASSUMING THE \$21/TON
SCC VALUE ^{a b c}

[Billions of 2007 dollars]

Discount rate	Model year					
	2012	2013	2014	2015	2016	Total
3%	\$21.8	\$32.0	\$42.8	\$60.8	\$83.3	\$240
7%	17.4	25.7	34.2	48.6	66.4	192

^a The benefits include all benefits considered by EPA such as the economic value of reduced fuel consumption and accompanying savings in refueling time, climate-related economic benefits from reducing emissions of CO₂ (but not other GHGs), economic benefits from reducing emissions of PM and other air pollutants that contribute to its formation, and reductions in energy security externalities caused by U.S. petroleum consumption and imports. The analysis also includes disbenefits stemming from additional vehicle use, such as the economic damages caused by accidents, congestion and noise.

^b Note that net present value of reduced GHG emissions is calculated differently than other benefits. The same discount rate used to discount the value of damages from future emissions (SCC at 5, 3, and 2.5 percent) is used to calculate net present value of SCC for internal consistency. Refer to Section III.H for more detail.

^c Monetized GHG benefits exclude the value of reductions in non-CO₂ GHG emissions (HFC, CH₄ and N₂O) expected under this final rule. Although EPA has not monetized the benefits of reductions in these non-CO₂ emissions, the value of these reductions should not be interpreted as zero. Rather, the reductions in non-CO₂ GHGs will contribute to this rule's climate benefits, as explained in Section III.F.2. The SCC TSD notes the difference between the social cost of non-CO₂ emissions and CO₂ emissions, and specifies a goal to develop methods to value non-CO₂ emissions in future analyses. Also, as noted in Section III.H, SCC increases over time. The \$21/ton value applies to 2010 emissions and grows larger over time.

Table I.C.2-4 shows EPA's estimated lifetime fuel savings, lifetime CO₂ emission reductions, and the monetized net present values of those fuel savings and CO₂ emission reductions. The gallons of fuel and CO₂ emission reductions are projected lifetime values for all vehicles sold in the model years

2012-2016. The estimated fuel savings in billions of barrels and the GHG reductions in million metric tons of CO₂ shown in Table I.C.2-4 are totals for the five model years throughout their projected lifetime and are not discounted. The monetized values shown in Table I.C.2-4 are the summed

values of the discounted monetized-fuel savings and monetized-CO₂ reductions for the five model years 2012-2016 throughout their lifetimes. The monetized values in Table I.C.2-4 reflect both a 3 percent and a 7 percent discount rate as noted.

TABLE I.C.2-4—EPA'S ESTIMATED 2012-2016 MODEL YEAR LIFETIME FUEL SAVINGS, CO₂ EMISSION REDUCTIONS, AND
DISCOUNTED MONETIZED BENEFITS AT A 3% DISCOUNT RATE

[Monetized values in 2007 dollars]

	Amount	\$ value (billions)
Fuel savings	1.8 billion barrels	\$182, 3% discount rate. \$142, 7% discount rate.

TABLE I.C.2-4—EPA'S ESTIMATED 2012-2016 MODEL YEAR LIFETIME FUEL SAVINGS, CO₂ EMISSION REDUCTIONS, AND DISCOUNTED MONETIZED BENEFITS AT A 3% DISCOUNT RATE—Continued
[Monetized values in 2007 dollars]

	Amount	\$ value (billions)
CO _{2c} emission reductions (CO ₂ portion valued assuming \$21/ton CO ₂ in 2010).	962 MMT CO _{2c}	\$17 ^{a,b} .

^a \$17 billion for 858 MMT of reduced CO₂ emissions. As noted in Section III.H, the \$21/ton value applies to 2010 emissions and grows larger over time. Monetized GHG benefits exclude the value of reductions in non-CO₂ GHG emissions (HFC, CH₄ and N₂O) expected under this final rule. Although EPA has not monetized the benefits of reductions in these non-CO₂ emissions, the value of these reductions should not be interpreted as zero. Rather, the reductions in non-CO₂ GHGs will contribute to this rule's climate benefits, as explained in Section III.F.2. The SCC TSD notes the difference between the social cost of non-CO₂ emissions and CO₂ emissions, and specifies a goal to develop methods to value non-CO₂ emissions in future analyses.

^b Note that net present value of reduced CO₂ emissions is calculated differently than other benefits. The same discount rate used to discount the value of damages from future emissions (SCC at 5, 3, and 2.5 percent) is used to calculate net present value of SCC for internal consistency. Refer to Section III.H for more detail.

Table I.C.2-5 shows EPA's estimated incremental and total technology outlays for cars and trucks for each of the model years 2012-2016. The technology outlays shown in Table I.C.2-5 are for the industry as a whole and do not account for fuel savings associated with the program.

TABLE I.C.2-5—EPA'S ESTIMATED INCREMENTAL TECHNOLOGY OUTLAYS
[Billions of 2007 dollars]

	2012	2013	2014	2015	2016	Total
Cars	\$3.1	\$5.0	\$6.5	\$8.0	\$9.4	\$31.9
Trucks	1.8	3.0	3.9	4.8	6.2	19.7
Combined	4.9	8.0	10.3	12.7	15.6	51.5

Table I.C.2-6 shows EPA's estimated incremental cost increase of the average new vehicle for each model year 2012-2016. The values shown are incremental to a baseline vehicle and are not

cumulative. In other words, the estimated increase for 2012 model year cars is \$342 relative to a 2012 model year car absent the National Program. The estimated increase for a 2013 model

year car is \$507 relative to a 2013 model year car absent the National Program (not \$342 plus \$507).

TABLE I.C.2-6—EPA'S ESTIMATED INCREMENTAL INCREASE IN AVERAGE NEW VEHICLE COST
[2007 dollars per unit]

	2012	2013	2014	2015	2016
Cars	\$342	\$507	\$631	\$749	\$869
Trucks	314	496	652	820	1,098
Combined	331	503	639	774	948

D. Background and Comparison of NHTSA and EPA Statutory Authority

Section I.C of the proposal contained a detailed overview discussion of the NHTSA and EPA statutory authorities. In addition to the discussion in the proposal, each agency discusses comments pertaining to its statutory authority and the agency's responses in Sections III and IV of this notice, respectively.

II. Joint Technical Work Completed for This Final Rule

A. Introduction

In this section NHTSA and EPA discuss several aspects of the joint technical analyses on which the two

agencies collaborated. These analyses are common to the development of each agency's final standards. Specifically we discuss: the development of the vehicle market forecast used by each agency for assessing costs, benefits, and effects, the development of the attribute-based standard curve shapes, the determination of the relative stringency between the car and truck fleet standards, the technologies the agencies evaluated and their costs and effectiveness, and the economic assumptions the agencies included in their analyses. The Joint Technical Support Document (TSD) discusses the agencies' joint technical work in more detail.

B. Developing the Future Fleet for Assessing Costs, Benefits, and Effects

1. Why did the agencies establish a baseline and reference vehicle fleet?

In order to calculate the impacts of the EPA and NHTSA regulations, it is necessary to estimate the composition of the future vehicle fleet absent these regulations, to provide a reference point relative to which costs, benefits, and effects of the regulations are assessed. As in the proposal, EPA and NHTSA have developed this comparison fleet in two parts. The first step was to develop a baseline fleet based on model year 2008 data. The second step was to project that fleet into model years 2011-2016. This is called the reference fleet.

The third step was to modify that MY 2011–2016 reference fleet such that it had sufficient technology to meet the MY 2011 CAFE standards. This final version of the reference fleet is the light-duty fleet estimated to exist in MY 2012–2016 in the absence of today's standards, based on the assumption that manufacturers would continue to meet the MY 2011 CAFE standards (or pay civil penalties allowed under EPCA⁴⁴) in the absence of further increases in the stringency of CAFE standards. Each agency used this approach to develop a final reference fleet to use in its modeling. All of the agencies' estimates of emission reductions, fuel economy improvements, costs, and societal impacts are developed in relation to the respective reference fleets.

EPA and NHTSA proposed a transparent approach to developing the baseline and reference fleets, largely working from publicly available data. This proposed approach differed from previous CAFE rules, which relied on confidential manufacturers' product plan information to develop the baseline. Most of the public comments to the NPRM addressing this issue supported this methodology for developing the inputs to the rule's analysis. Because the input sheets can be made public, stakeholders can verify and check EPA's and NHTSA's modeling, and perform their own analyses with these datasets. In this final rulemaking, EPA and NHTSA are using an approach very similar to that proposed, continuing to rely on publicly available data as the basis for the baseline and reference fleets.

2. How did the agencies develop the baseline vehicle fleet?

At proposal, EPA and NHTSA developed a baseline fleet comprised of model year 2008 data gathered from EPA's emission certification and fuel economy database. MY 2008 was used as the basis for the baseline vehicle fleet because it was the most recent model year for which a complete set of data is publicly available. This remains the case. Manufacturers are not required to submit final sales and mpg figures for MY 2009 until April 2010,⁴⁵ after the CAFE standard's mandated promulgation date. Consequently, in this final rule, EPA and NHTSA made no changes to the method or the results

of the MY 2008 baseline fleet used at proposal, except for some specific corrections to engineering inputs for some vehicle models reflected in the market forecast input to NHTSA's CAFE model. More details about how the agencies constructed this baseline fleet can be found in Chapter 1.2 of the Joint TSD. Corrections to engineering inputs for some vehicle models in the market forecast input to NHTSA's CAFE model are discussed in Chapter 2 of the Joint TSD.

3. How did the agencies develop the projected MY 2011–2016 vehicle fleet?

EPA and NHTSA have based the projection of total car and total light truck sales for MYs 2011–2016 on projections made by the Department of Energy's Energy Information Administration (EIA). EIA publishes a mid-term projection of national energy use called the Annual Energy Outlook (AEO). This projection utilizes a number of technical and econometric models which are designed to reflect both economic and regulatory conditions expected to exist in the future. In support of its projection of fuel use by light-duty vehicles, EIA projects sales of new cars and light trucks. In the proposal, the agencies used the three reports published by EIA as part of the AEO 2009. We also stated that updated versions of these reports could be used in the final rules should AEO timely issue a new version. EIA published an early version of its AEO 2010 in December 2009, and the agencies are making use of it in this final rulemaking. The differences in projected sales in the 2009 report (used in the NPRM) and the early 2010 report are very small, so NHTSA and EPA have decided to simply scale the NPRM volumes for cars and trucks (in the aggregate) to match those in the 2010 report. We thus employ the sales projections from the scaled updated 2009 Annual Energy Outlook, which is equivalent to AEO 2010 Early Release, for the final rule. The scaling factors for each model year are presented in Chapter 1 of the Joint TSD for this final rule.

The agencies recognize that AEO 2010 Early Release does include some impacts of future projected increases in CAFE stringency. We have closely examined the difference between AEO 2009 and AEO 2010 Early Release and we believe the differences in total sales and the car/truck split attributed to considerations of the standard in the final rule are small.⁴⁶

⁴⁶ The agencies have also looked at the impact of the rule in EIA's projection, and concluded that the

In the AEO 2010 Early Release, EIA projects that total light-duty vehicle sales will gradually recover from their currently depressed levels by around 2013. In 2016, car sales are projected to be 9.4 million (57 percent) and truck sales are projected to be 7.1 million (43 percent). Although the total level of sales of 16.5 million units is similar to pre-2008 levels, the fraction of car sales is projected to be higher than that existing in the 2000–2007 timeframe. This projection reflects the impact of higher fuel prices, as well as EISA's requirement that the new vehicle fleet average at least 35 mpg by MY 2020. The agencies note that AEO does not represent the fleet at a level of detail sufficient to explicitly account for the reclassification—promulgated as part of NHTSA's final rule for MY 2011 CAFE standards—of a number of 2-wheel drive sport utility vehicles from the truck fleet to the car fleet for MYs 2011 and after. Sales projections of cars and trucks for future model years can be found in the Joint TSD for these final rules.

In addition to a shift towards more car sales, sales of segments within both the car and truck markets have been changing and are expected to continue to change. Manufacturers are introducing more crossover models which offer much of the utility of SUVs but use more car-like designs. The AEO 2010 report does not, however, distinguish such changes within the car and truck classes. In order to reflect these changes in fleet makeup, EPA and NHTSA considered several other available forecasts. EPA purchased and shared with NHTSA forecasts from two well-known industry analysts, CSM Worldwide (CSM), and J.D. Powers. NHTSA and EPA decided to use the forecast from CSM, modified as described below, for several reasons presented in the NPRM preamble⁴⁷ and draft Joint TSD. The changes between company market share and industry market segments were most significant from 2011–2014, while for 2014–2015 the changes were relatively small. Noting this, and lacking a credible forecast of company and segment shares after 2015, the agencies assumed 2016 market share and market segments to be the same as for 2015.

impact was small. EPA and NHTSA have evaluated the differences between the AEO 2010 (early draft) and AEO 2009 and found little difference in the fleet projections (or fuel prices). This analysis can be found in the memo to the docket: Kahan, A. and Pickrell, D. Memo to Docket EPA-HQ-OAR-2009-0472 and Docket NHTSA-2009-0059. "Energy Information Administration's Annual Energy Outlook 2009 and 2010." March 24, 2010.

⁴⁷ See, e.g., 74 FR 49484.

⁴⁴ That is, the manufacturers who have traditionally paid fines under EPCA instead of complying with the CAFE standards were "allowed," for purposes of the reference fleet, to reach only the CAFE level at which paying fines became more cost-effective than adding technology, even if that fell short of the MY 2011 standards.

⁴⁵ 40 CFR 600.512–08, Model Year Report.

CSM Worldwide provides quarterly sales forecasts for the automotive industry. In the NPRM, the agencies identified a concern with the 2nd quarter CSM forecast that was used as a basis for the projection. CSM projections at that time were based on an industry that was going through a significant financial transition, and as a result the market share forecasts for some companies were impacted in surprising ways. As the industry's situation has settled somewhat over the past year, the 4th quarter projection appears to address this issue—for example, it shows nearly a two-fold increase in sales for Chrysler compared to significant loss of market share shown for Chrysler in the 2nd quarter

projection. Additionally, some commenters, such as GM, recognized that the fleet appeared to include an unusually high number of large pickup trucks.⁴⁸ In fact, the agencies discovered (independently of the comments) that CSM's standard forecast included all vehicles below 14,000 GVWR, including class 2b and 3 heavy duty vehicles, which are not regulated by this final rule.⁴⁹ The commenters were thus correct that light duty reference fleet projections at proposal had more full size trucks and vans due to the mistaken inclusion of the heavy duty versions of those vehicles. The agencies requested a separate data forecast from CSM that filtered their 4th quarter projection to exclude these heavy duty vehicles. The

agencies then used this filtered 4th quarter forecast for the final rule. A detailed comparison of the market by manufacturer can be found in the final TSD. For the public's reference, copies of the 2nd, 3rd, and 4th quarter CSM forecasts have been placed in the docket for this rulemaking.⁵⁰

We then projected the CSM forecasts for relative sales of cars and trucks by manufacturer and by market segment onto the total sales estimates of AEO 2010. Tables II.B.3–1 and II.B.3–2 show the resulting projections for the reference 2016 model year and compare these to actual sales that occurred in baseline 2008 model year. Both tables show sales using the traditional definition of cars and light trucks.

TABLE II.B.3–1—ANNUAL SALES OF LIGHT-DUTY VEHICLES BY MANUFACTURER IN 2008 AND ESTIMATED FOR 2016

	Cars		Light trucks		Total	
	2008 MY	2016 MY	2008 MY	2016 MY	2008 MY	2016 MY
BMW	291,796	424,923	61,324	171,560	353,120	596,482
Chrysler	537,808	340,908	1,119,397	525,128	1,657,205	866,037
Daimler	208,052	272,252	79,135	126,880	287,187	399,133
Ford	709,583	1,118,727	1,158,805	1,363,256	1,868,388	2,481,983
General Motors	1,370,280	1,283,937	1,749,227	1,585,828	3,119,507	2,869,766
Honda	899,498	811,214	612,281	671,437	1,511,779	1,482,651
Hyundai	270,293	401,372	120,734	211,996	391,027	613,368
Kia	145,863	455,643	135,589	210,717	281,452	666,360
Mazda	191,326	350,055	111,220	144,992	302,546	495,047
Mitsubishi	76,701	49,914	24,028	88,754	100,729	138,668
Porsche	18,909	33,471	18,797	16,749	37,706	50,220
Nissan	653,121	876,677	370,294	457,114	1,023,415	1,333,790
Subaru	149,370	230,705	49,211	95,054	198,581	325,760
Suzuki	68,720	97,466	45,938	26,108	114,658	123,574
Tata	9,596	65,806	55,584	42,695	65,180	108,501
Toyota	1,143,696	2,069,283	1,067,804	1,249,719	2,211,500	3,319,002
Volkswagen	290,385	586,011	26,999	124,703	317,384	710,011
Total	7,034,997	9,468,365	6,806,367	7,112,689	13,841,364	16,580,353

TABLE II.B.3–2—ANNUAL SALES OF LIGHT-DUTY VEHICLES BY MARKET SEGMENT IN 2008 AND ESTIMATED FOR 2016

Cars			Light trucks		
	2008 MY	2016 MY		2008 MY	2016 MY
Full-Size Car	829,896	530,945	Full-Size Pickup	1,331,989	1,379,036
Luxury Car	1,048,341	1,548,242	Mid-Size Pickup	452,013	332,082
Mid-Size Car	2,166,849	2,550,561	Full-Size Van	33,384	65,650
Mini Car	617,902	1,565,373	Mid-Size Van	719,529	839,194
Small Car	1,912,736	2,503,566	Mid-Size MAV *	110,353	116,077
Specialty Car	459,273	769,679	Small MAV	231,265	62,514
			Full-Size SUV *	559,160	232,619
			Mid-Size SUV	436,080	162,502
			Small SUV	196,424	108,858
			Full-Size CUV *	264,717	260,662
			Mid-Size CUV	923,165	1,372,200
			Small CUV	1,548,288	2,181,296

⁴⁸ GM argued that the unusually large volume of large pickups led to higher overall requirements for those vehicles. As discussed below, the agencies' analysis for the final rule corrects the number of large pickups. With this correction and other updates to the agencies' market forecast and other analytical inputs, the target functions defining the

final standards (and achieving the average required performance levels defining the national program) are very similar to those from the NPRM, especially for light trucks, as illustrated below in Figures II.C–7 and II.C–8.

⁴⁹ These include the Ford F–250 & F–350, Econoline E–250, & E–350; Chevy Express,

Silverado 2500, & 3500; GMC Savana, Dodge 2500, & 3500; among others.

⁵⁰ The CSM Sales Forecast Excel file (“CSM North America Sales Forecasts 2Q09 3Q09 4Q09 for the Docket”) is available in the docket (Docket EPA–HQ–OAR–2009–0472).

TABLE II.B.3-2—ANNUAL SALES OF LIGHT-DUTY VEHICLES BY MARKET SEGMENT IN 2008 AND ESTIMATED FOR 2016—
Continued

Cars			Light trucks		
	2008 MY	2016 MY		2008 MY	2016 MY
Total Sales **	7,034,997	9,468,365	6,806,367	7,079,323

* MAV—Multi-Activity Vehicle, SUV—Sport Utility Vehicle, CUV—Crossover Utility Vehicle.

** Total Sales are based on the classic Car/Truck definition.

Determining which traditionally-defined trucks will be defined as cars for purposes of this final rule using the revised definition established by NHTSA for MYs 2011 and beyond requires more detailed information about each vehicle model. This is described in greater detail in Chapter 1 of the final TSD.

The forecasts obtained from CSM provided estimates of car and truck sales by segment and by manufacturer, but not by manufacturer for each market segment. Therefore, NHTSA and EPA needed other information on which to base these more detailed projected market splits. For this task, the agencies used as a starting point each manufacturer's sales by market segment from model year 2008, which is the baseline fleet. Because of the larger number of segments in the truck market, the agencies used slightly different methodologies for cars and trucks.

The first step for both cars and trucks was to break down each manufacturer's 2008 sales according to the market segment definitions used by CSM. For example, the agencies found that Ford's⁵¹ cars sales in 2008 were broken down as shown in Table II.B.3-3:

TABLE II.B.3-3—BREAKDOWN OF
FORD'S 2008 CAR SALES

Full-size cars	160,857 units.
Mid-size Cars	170,399 units.
Small/Compact Cars	180,249 units.
Subcompact/Mini Cars	None.
Luxury cars	87,272 units.
Specialty cars	110,805 units.

EPA and NHTSA then adjusted each manufacturer's sales of each of its car segments (and truck segments, separately) so that the manufacturer's total sales of cars (and trucks) matched the total estimated for each future model year based on AEO and CSM forecasts. For example, as indicated in Table II.B.3-1, Ford's total car sales in 2008 were 709,583 units, while the agencies

project that they will increase to 1,113,333 units by 2016. This represents an increase of 56.9 percent. Thus, the agencies increased the 2008 sales of each Ford car segment by 56.9 percent. This produced estimates of future sales which matched total car and truck sales per AEO and the manufacturer breakdowns per CSM. However, the sales splits by market segment would not necessarily match those of CSM (shown for 2016 in Table II.B.3-2).

In order to adjust the market segment mix for cars, the agencies first adjusted sales of luxury, specialty and other cars. Since the total sales of cars for each manufacturer were already set, any changes in the sales of one car segment had to be compensated by the opposite change in another segment. For the luxury, specialty and other car segments, it is not clear how changes in sales would be compensated. For example, if luxury car sales decreased, would sales of full-size cars increase, mid-size cars, and so on? The agencies have assumed that any changes in the sales of cars within these three segments were compensated for by proportional changes in the sales of the other four car segments. For example, for 2016, the figures in Table II.B.3-2 indicate that luxury car sales in 2016 are 1,548,242 units. Luxury car sales are 1,048,341 units in 2008. However, after adjusting 2008 car sales by the change in total car sales for 2016 projected by EIA and a change in manufacturer market share per CSM, luxury car sales decreased to 1,523,171 units. Thus, overall for 2016, luxury car sales had to increase by 25,071 units or 6 percent. The agencies accordingly increased the luxury car sales by each manufacturer by this percentage. The absolute decrease in luxury car sales was spread across sales of full-size, mid-size, compact and subcompact cars in proportion to each manufacturer's sales in these segments in 2008. The same adjustment process was used for specialty cars and the "other cars" segment defined by CSM.

The agencies used a slightly different approach to adjust for changing sales of the remaining four car segments. Starting with full-size cars, the agencies again determined the overall percentage

change that needed to occur in future year full-size car sales after 1) adjusting for total sales per AEO 2010, 2) adjusting for manufacturer sales mix per CSM and 3) adjusting the luxury, specialty and other car segments, in order to meet the segment sales mix per CSM. Sales of each manufacturer's large cars were adjusted by this percentage. However, instead of spreading this change over the remaining three segments, the agencies assigned the entire change to mid-size vehicles. The agencies did so because the CSM data followed the trend of increasing volumes of smaller cars while reducing volumes of larger cars. If a consumer had previously purchased a full-size car, we thought it unlikely that their next purchase would decrease by two size categories, down to a subcompact. It seemed more reasonable to project that they would drop one vehicle size category smaller. Thus, the change in each manufacturer's sales of full-size cars was matched by an opposite change (in absolute units sold) in mid-size cars.

The same process was then applied to mid-size cars, with the change in mid-size car sales being matched by an opposite change in compact car sales. This process was repeated one more time for compact car sales, with changes in sales in this segment being matched by the opposite change in the sales of subcompacts. The overall result was a projection of car sales for model years 2012–2016—the reference fleet—which matched the total sales projections of the AEO forecast and the manufacturer and segment splits of the CSM forecast. These sales splits can be found in Chapter 1 of the Joint TSD for this final rule.

As mentioned above, the agencies applied a slightly different process to truck sales, because the agencies could not confidently project how the change in sales from one segment preferentially went to or came from another particular segment. Some trend from larger vehicles to smaller vehicles would have been possible. However, the CSM forecasts indicated large changes in total sport utility vehicle, multi-activity vehicle and cross-over sales which could not be connected. Thus, the

⁵¹ Note: In the NPRM, Ford's 2008 sales per segment, and the total number of cars was different than shown here. The change in values is due to a correction of vehicle segments for some of Ford's vehicles.

agencies applied an iterative, but straightforward process for adjusting 2008 truck sales to match the AEO and CSM forecasts.

The first three steps were exactly the same as for cars. EPA and NHTSA broke down each manufacturer's truck sales into the truck segments as defined by CSM. The agencies then adjusted all manufacturers' truck segment sales by the same factor so that total truck sales in each model year matched AEO projections for truck sales by model year. The agencies then adjusted each manufacturer's truck sales by segment proportionally so that each manufacturer's percentage of total truck sales matched that forecast by CSM. This again left the need to adjust truck sales by segment to match the CSM forecast for each model year.

In the fourth step, the agencies adjusted the sales of each truck segment by a common factor so that total sales for that segment matched the combination of the AEO and CSM forecasts. For example, projected sales of large pickups across all manufacturers were 1,286,184 units in 2016 after adjusting total sales to match AEO's forecast and adjusting each manufacturer's truck sales to match CSM's forecast for the breakdown of sales by manufacturer. Applying CSM's forecast of the large pickup segment of truck sales to AEO's total sales forecast indicated total large pickup sales of 1,379,036 units. Thus, we increased each manufacturer's sales of large pickups by 7 percent.⁵² The agencies applied the same type of adjustment to all the other truck segments at the same time. The result was a set of sales projections which matched AEO's total truck sales projection and CSM's market segment forecast. However, after this step, sales by manufacturer no longer met CSM's forecast. Thus, we repeated step three and adjusted each manufacturer's truck sales so that they met CSM's forecast. The sales of each truck segment (by manufacturer) were adjusted by the same factor. The resulting sales projection matched AEO's total truck sales projection and CSM's manufacturer forecast, but sales by market segment no longer met CSM's forecast. However, the difference between the sales projections after this fifth step was closer to CSM's market segment forecast than it was after step three. In other words, the sales projection was converging to the desired

result. The agencies repeated these adjustments, matching manufacturer sales mix in one step and then market segment in the next a total of 19 times. At this point, we were able to match the market segment splits exactly and the manufacturer splits were within 0.1 percent of our goal, which is well within the needs of this analysis.

The next step in developing the reference fleets was to characterize the vehicles within each manufacturer-segment combination. In large part, this was based on the characterization of the specific vehicle models sold in 2008—*i.e.*, the vehicles comprising the baseline fleet. EPA and NHTSA chose to base our estimates of detailed vehicle characteristics on 2008 sales for several reasons. One, these vehicle characteristics are not confidential and can thus be published here for careful review by interested parties. Two, because it is constructed beginning with actual sales data, this vehicle fleet is limited to vehicle models known to satisfy consumer demands in light of price, utility, performance, safety, and other vehicle attributes.

As noted above, the agencies gathered most of the information about the 2008 baseline vehicle fleet from EPA's emission certification and fuel economy database. The data obtained from this source included vehicle production volume, fuel economy, engine size, number of engine cylinders, transmission type, fuel type, etc. EPA's certification database does not include a detailed description of the types of fuel economy-improving/CO₂-reducing technologies considered in this final rule. Thus, the agencies augmented this description with publicly available data which includes more complete technology descriptions from Ward's Automotive Group.⁵³ In a few instances when required vehicle information (such as vehicle footprint) was not available from these two sources, the agencies obtained this information from publicly accessible Internet sites such as *Motortrend.com* and *Edmunds.com*.⁵⁴

The projections of future car and truck sales described above apply to each manufacturer's sales by market segment. The EPA emissions certification sales data are available at a much finer level of detail, essentially vehicle configuration. As mentioned above, the agencies placed each vehicle in the EPA certification database into one of the CSM market segments. The agencies then totaled the sales by each

manufacturer for each market segment. If the combination of AEO and CSM forecasts indicated an increase in a given manufacturer's sales of a particular market segment, then the sales of all the individual vehicle configurations were adjusted by the same factor. For example, if the Prius represented 30 percent of Toyota's sales of compact cars in 2008 and Toyota's sales of compact cars in 2016 was projected to double by 2016, then the sales of the Prius were doubled, and the Prius sales in 2016 remained 30 percent of Toyota's compact car sales.

The projection of average footprint for both cars and trucks remained virtually constant over the years covered by the final rulemaking. This occurrence is strictly a result of the CSM projections. There are a number of trends that occur in the CSM projections that caused the average footprint to remain constant. First, as the number of subcompacts increases, so do the number of 2-wheel drive crossover vehicles (that are regulated as cars). Second, truck volumes have many segment changes during the rulemaking time frame. There is no specific footprint related trend in any segment that can be linked to the unchanging footprint, but there is a trend that non-pickups' volumes will move from truck segments that are ladder frame to those that are unibody-type vehicles. A table of the footprint projections is available in the TSD as well as further discussion on this topic.

4. How was the development of the baseline and reference fleets for this Final Rule different from NHTSA's historical approach?

NHTSA has historically based its analysis of potential new CAFE standards on detailed product plans the agency has requested from manufacturers planning to produce light vehicles for sale in the United States. Although the agency has not attempted to compel manufacturers to submit such information, most major manufacturers and some smaller manufacturers have voluntarily provided it when requested.

The proposal discusses many of the advantages and disadvantages of the market forecast approach used by the agencies, including the agencies' interest in examining product plans as a check on the reference fleet developed by the agencies for this rulemaking. One of the primary reasons for the request for data in 2009 was to obtain permission from the manufacturers to make public their product plan information for model years 2010 and 2011. There are a number of reasons that this could be advantageous in the development of a reference fleet. First,

⁵² Note: In the NPRM this example showed 29 percent instead of 7 percent. The significant decrease was due to using the filtered 4th quarter CSM forecast. Commenters, such as GM, had commented that we had too many full-size trucks and vans, and this change addresses their comment.

⁵³ Note that WardsAuto.com is a fee-based service, but all information is public to subscribers.

⁵⁴ Motortrend.com and Edmunds.com are free, no-fee Internet sites.

some known changes to the fleet may not be captured by the approach of solely using publicly available information. For example, the agencies' current market forecast includes some vehicles for which manufacturers have announced plans for elimination or drastic production cuts such as the Chevrolet Trailblazer, the Chrysler PT Cruiser, the Chrysler Pacifica, the Dodge Magnum, the Ford Crown Victoria, the Mercury Sable, the Pontiac Grand Prix, the Pontiac G5 and the Saturn Vue. These vehicle models appear explicitly in market inputs to NHTSA's analysis, and are among those vehicle models included in the aggregated vehicle types appearing in market inputs to EPA's analysis. However, although the agencies recognize that these specific vehicles will be discontinued, we continue to include them in the market forecast because they are useful as a surrogate for successor vehicles that may appear in the rulemaking time frame to replace the discontinued vehicles in that market segment.⁵⁵

Second, the agencies' market forecast does not include some forthcoming vehicle models, such as the Chevrolet Volt, the Ford Fiesta and several publicly announced electric vehicles, including the announcements from Nissan regarding the Leaf. Nor does it include several MY 2009 or 2010 vehicles, such as the Honda Insight, the Hyundai Genesis and the Toyota Venza, as our starting point for defining specific vehicle models in the reference fleet was Model Year 2008.

Additionally, the market forecast does not account for publicly announced technology introductions, such as Ford's EcoBoost system, whose product plans specify which vehicles and how many are planned to have this technology. Chrysler Group LLC has announced plans to offer small- and medium-sized cars using Fiat powertrains. Were the agencies to rely on manufacturers' product plans (that were submitted), the market forecast would account for not only these specific examples, but also for similar examples that have not yet been announced publicly.

Some commenters, such as CBD and NESCAUM, suggested that the agencies' omission of known future vehicles and technologies in the reference fleet causes inaccuracies, which CBD further suggested could lead the agencies to set lower standards. On the other hand,

CARB commented that "the likely impact of this omission is minor." Because the agencies' analysis examines the costs and benefits of progressively adding technology to manufacturers' fleets, the omission of future vehicles and technologies primarily affects how much additional technology (and, therefore, how much incremental cost and benefit) is available relative to the point at which the agencies' examination of potential new standards begins. Thus, in fact, the omission only reflects the reference fleet, rather than the agencies' conclusions regarding how stringent the standards should be. This is discussed further below. The agencies believe the above-mentioned comments by CBD, NESCAUM, and others are based on a misunderstanding of the agencies' approach to analyzing potential increases in regulatory stringency. The agencies also note that manufacturers do not always use technology solely to increase fuel economy, and that use of technology to increase vehicles' acceleration performance or utility would probably make that technology unavailable toward more stringent standards. Considering the incremental nature of the agencies' analysis, and the counterbalancing aspects of potentially omitted technology in the reference fleet, the agencies believe their determination of the stringency of new standards has not been impacted by any such omissions.

Moreover, EPA and NHTSA believe that not including such vehicles after MY 2008 does not significantly impact our estimates of the technology required to comply with the standards. If included, these vehicles could increase the extent to which manufacturers are, in the reference case, expected to over-comply with the MY 2011 CAFE standards, and could thereby make the new standards appear to cost less and yield less benefit relative to the reference case. However, in the agencies' judgment, production of the most advanced technology vehicles, such as the Chevy Volt or the Nissan Leaf (for example), will most likely be too limited during MY 2011 through MY 2016 to significantly impact manufacturers' compliance positions. While we are projecting the characteristics of the future fleet by extrapolating from the MY 2008 fleet, the primary difference between the future fleet and the 2008 fleet in the same vehicle segment is the use of additional CO₂-reducing and fuel-saving technologies. Both the NHTSA and EPA models add such technologies to evaluate means of complying with the

standards, and the costs of doing so. Thus, our future projections of the vehicle fleet generally shift vehicle designs towards those more likely to be typical of newer vehicles. Compared to using product plans that show continued fuel economy increases planned based on expectations that CAFE standards will continue to increase, this approach helps to clarify the costs and benefits of the new standards, as the costs and benefits of all fuel economy improvements beyond those required by the MY 2011 CAFE standards are being assigned to the final rules. In some cases, the "actual" (vs. projected or "modeled") new vehicles being introduced into the market by manufacturers are done so in anticipation of this rulemaking. On the other hand, manufacturers may plan to continue using technologies to improve vehicle performance and/or utility, not just fuel economy. Our approach prevents some of these actual technological improvements and their associated cost and fuel economy improvements from being assumed in the reference fleet. Thus, the added technology will not be considered to be free (or having no benefits) for the purposes of this rule.

In this regard, the agencies further note that manufacturer announcements regarding forward models (or future vehicle models) need not be accepted automatically. Manufacturers tend to limit accurate production intent information in these releases for reasons such as: (a) Competitors will closely examine their information for data in their product planning decisions; (b) the press coverage of forward model announcements is not uniform, meaning highly anticipated models have more coverage and materials than models that may be less exciting to the public and consistency and uniformity cannot be ensured with the usage of press information; and (c) these market projections are subject to change (sometimes significant), and manufacturers may not want to give the appearance of being indecisive, or under/over-confident to their shareholders and the public with premature release of information.

NHTSA has evaluated the use of public manufacturer forward model press information to update the vehicle fleet inputs to the baseline and reference fleet. The challenges in this approach are evidenced by the continuous stream of manufacturer press releases throughout a defined rulemaking period. Manufacturers' press releases suffer from the same types of inaccuracies that many commenters believe can affect product plans.

⁵⁵ An example of this is in the GM Pontiac line, which is in the process of being phased out during the course of this rulemaking. GM has similar vehicles within their other brands (like Chevy) that will "presumably" pick up the loss in Pontiac share. We model this simply by leaving the Pontiac brand in.

Manufacturers can often be overly optimistic in their press releases, both on projected date of release of new models and on sales volumes.

More generally and more critically, as discussed in the proposal and as endorsed by many of the public comments, there are several advantages to the approach used by the agencies in this final rule. Most importantly, today's market forecast is much more transparent. The information sources used to develop today's market forecast are all either in the public domain or available commercially. Another significant advantage of today's market forecast is the agencies' ability to assess more fully the incremental costs and benefits of the proposed standards. In addition, by developing baseline and reference fleets from common sources, the agencies have been able to avoid some errors—perhaps related to interpretation of requests—that have been observed in past responses to NHTSA's requests. An additional advantage of the approach used for this rule is a consistent projection of the change in fuel economy and CO₂ emissions across the various vehicles from the application of new technology. With the approach used for this final rule, the baseline market data comes from actual vehicles (on the road today) which have actual fuel economy test data (in contrast to manufacturer estimates of future product fuel economy)—so there is no question what is the basis for the fuel economy or CO₂ performance of the baseline market data as it is.

5. How does manufacturer product plan data factor into the baseline used in this Final Rule?

In the spring and fall of 2009, many manufacturers submitted product plans in response to NHTSA's recent requests that they do so. NHTSA and EPA both have access to these plans, and both agencies have reviewed them in detail. A small amount of product plan data was used in the development of the baseline. The specific pieces of data are:

- Wheelbase.
- Track Width Front.
- Track Width Rear.
- EPS (Electric Power Steering).
- ROLL (Reduced Rolling Resistance).
- LUB (Advance Lubrication *i.e.* low weight oil).
- IACC (Improved Electrical Accessories).
- Curb Weight.
- GVWR (Gross Vehicle Weight Rating).

The track widths, wheelbase, curb weight, and GVWR for vehicles could have been looked up on the Internet

(159 were), but were taken from the product plans when available for convenience. To ensure accuracy, a sample from each product plan was used as a check against the numbers available from *Motortrend.com*. These numbers will be published in the baseline file since they can be easily looked up on the internet. On the other hand, EPS, ROLL, LUB, and IACC are difficult to determine without using manufacturer's product plans. These items will not be published in the baseline file, but the data has been aggregated into the agencies' baseline in the technology effectiveness and cost effectiveness for each vehicle in a way that allows the baseline for the model to be published without revealing the manufacturer's data.

Also, some technical information that manufacturers have provided in product plans regarding specific vehicle models is, at least insofar as NHTSA and EPA have been able to determine, not available from public or commercial sources. While such gaps do not bear significantly on the agencies' analysis, the diversity of pickup configurations necessitated utilizing a sales-weighted average footprint value⁵⁶ for many manufacturers' pickups. Since our modeling only utilizes footprint in order to estimate each manufacturer's CO₂ or fuel economy standard and all the other vehicle characteristics are available for each pickup configuration, this approximation has no practical impact on the projected technology or cost associated with compliance with the various standards evaluated. The only impact which could arise would be if the relative sales of the various pickup configurations changed, or if the agencies were to explore standards with a different shape. This would necessitate recalculating the average

⁵⁶ A full-size pickup might be offered with various combinations of cab style (*e.g.*, regular, extended, crew) and box length (*e.g.*, 5½', 6½', 8') and, therefore, multiple footprint sizes. CAFE compliance data for MY 2008 data does not contain footprint information, and does not contain information that can be used to reliably identify which pickup entries correspond to footprint values estimable from public or commercial sources. Therefore, the agencies have used the known production levels of average values to represent all variants of a given pickup line (*e.g.*, all variants of the F-150 and the Sierra/Silverado) in order to calculate the sales-weighted average footprint value for each pickup family. Again, this has no impact on the results of our modeling effort, although it would require re-estimation if we were to examine light truck standards of a different shape. In the extreme, one single footprint value could be used for every vehicle sold by a single manufacturer as long as the fuel economy standard associated with this footprint value represented the sales-weighted, harmonic average of the fuel economy standards associated with each vehicle's footprint values.

footprint value in order to maintain accuracy.

Additionally, as discussed in the NPRM, in an effort to update the 2008 baseline to account for the expected changes in the fleet in the near-term model years 2009–2011 described above, NHTSA requested permission from the manufacturers to make this limited product plan information public. Unfortunately, virtually no manufacturers agreed to allow the use of their data after 2009 model year. A few manufacturers, such as GM and Ford, stated we could use their 2009 product plan data after the end of production (December 31), but this would not have afforded us sufficient time to do the analysis for the final rule. Since the agencies were unable to obtain consistent updates, the baseline and reference fleets were not updated beyond 2008 model year for the final rule. The 2008 baseline fleet and projections were instead updated using the latest AEO and CSM data as discussed earlier.

NHTSA and EPA recognize that the approach applied for the current rule gives transparency and openness of the vehicle market forecast high priority, and accommodates minor inaccuracies that may be introduced by not accounting for future product mix changes anticipated in manufacturers' confidential product plans. For any future fleet analysis that the agencies are required to perform, NHTSA and EPA plan to request that manufacturers submit product plans and allow some public release of information. In performing this analysis, the agencies plan to reexamine potential tradeoffs between transparency and technical reasonableness, and to explain resultant choices.

C. Development of Attribute-Based Curve Shapes

In the NPRM, NHTSA and EPA proposed to set attribute-based CAFE and CO₂ standards that are defined by a mathematical function for MYs 2012–2016 passenger cars and light trucks. EPCA, as amended by EISA, expressly requires that CAFE standards for passenger cars and light trucks be based on one or more vehicle attributes related to fuel economy, and be expressed in the form of a mathematical function.⁵⁷ The CAA has no such requirement, though in past rules, EPA has relied on both universal and attribute-based standards (*e.g.*, for nonroad engines, EPA uses the attribute of horsepower). However, given the advantages of using attribute-based standards and given the

⁵⁷ 49 U.S.C. 32902(a)(3)(A).

goal of coordinating and harmonizing CO₂ standards promulgated under the CAA and CAFE standards promulgated under EPCA, EPA also proposed to issue standards that are attribute-based and defined by mathematical functions. There was consensus in the public comments that EPA should develop attribute-based CO₂ standards.

Comments received in response to the agencies' decision to base standards on vehicle footprint were largely supportive. Several commenters (BMW, NADA, NESCAUM) expressed support for attribute-based (as opposed to flat or universal) standards generally, and agreed with EPA's decision to harmonize with NHTSA in this respect. Many commenters (Aluminum Association, BMW, ICCT, NESCAUM, NY DEC, Schade, Toyota) also supported the agencies' decision to continue setting CAFE standards, and begin setting GHG standards, on the basis of vehicle footprint, although one commenter (NJ DEP) opposed the use of footprint due to concern that it encourages manufacturers to upsize vehicles and undercut the gains of the standard. Of the commenters supporting the use of footprint, several focused on the benefits of harmonization—both between EPA and NHTSA, and between the U.S. and the rest of the world. BMW commented, for example, that many other countries use weight-based standards rather than footprint-based. While BMW did not object to NHTSA's and EPA's use of footprint-based standards, it emphasized the impact of this non-harmonization on manufacturers who sell vehicles globally, and asked the agencies to consider these effects. NADA supported the use of footprint, but cautioned that the agencies must be careful in setting the footprint curve for light trucks to ensure that manufacturers can continue to provide functionality like 4WD and towing/hauling capacity.

Some commenters requested that the agencies consider other or more attributes in addition to footprint, largely reiterating comments submitted

to the MYs 2011–2015 CAFE NPRM. Cummins supported the agencies using a secondary attribute to account for towing and hauling capacity in large trucks, for example, while Ferrari asked the agencies to consider a multi-attribute approach incorporating curb weight, maximum engine power or torque, and/or engine displacement, as it had requested in the previous round of CAFE rulemaking. An individual, Mr. Kenneth Johnson, commented that weight-based standards would be preferable to footprint-based ones, because weight correlates better with fuel economy than footprint, because the use of footprint does not necessarily guarantee safety the way the agencies say it does, and because weight-based standards would be fairer to manufacturers.

In response, EPA and NHTSA continue to believe that the benefits of footprint-attribute-based standards outweigh any potential drawbacks raised by commenters, and that harmonization between the two agencies should be the overriding goal on this issue. As discussed by NHTSA in the MY 2011 CAFE final rule,⁵⁸ the agencies believe that the possibility of gaming is lowest with footprint-based standards, as opposed to weight-based or multi-attribute-based standards. Specifically, standards that incorporate weight, torque, power, towing capability, and/or off-road capability in addition to footprint would not only be significantly more complex, but by providing degrees of freedom with respect to more easily-adjusted attributes, they would make it less certain that the future fleet would actually achieve the average fuel economy and CO₂ levels projected by the agencies. The agencies recognize that based on economic and consumer demand factors that are external to this rule, the distribution of footprints in the future may be different (either smaller or larger) than what is projected in this rule. However, the agencies continue to believe that there will not be significant shifts in this distribution as a direct

consequence of this rule. The agencies are therefore finalizing MYs 2012–2016 CAFE and GHG standards based on footprint.

The agencies also recognize that there could be benefits for a number of manufacturers if there was greater international harmonization of fuel economy and GHG standards, but this is largely a question of how stringent standards are and how they are enforced. It is entirely possible that footprint-based and weight-based systems can coexist internationally and not present an undue burden for manufacturers if they are carefully crafted. Different countries or regions may find different attributes appropriate for basing standards, depending on the particular challenges they face—from fuel prices, to family size and land use, to safety concerns, to fleet composition and consumer preference, to other environmental challenges besides climate change. The agencies anticipate working more closely with other countries and regions in the future to consider how to mitigate these issues in a way that least burdens manufacturers while respecting each country's need to meet its own particular challenges.

Under an attribute-based standard, every vehicle model has a performance target (fuel economy and CO₂ emissions for CAFE and CO₂ emissions standards, respectively), the level of which depends on the vehicle's attribute (for the proposal, footprint). The manufacturers' fleet average performance is determined by the production-weighted⁵⁹ average (for CAFE, harmonic average) of those targets. NHTSA and EPA are promulgating CAFE and CO₂ emissions standards defined by constrained linear functions and, equivalently, piecewise linear functions.⁶⁰ As a possible option for future rulemakings, the constrained linear form was introduced by NHTSA in the 2007 NPRM proposing CAFE standards for MY 2011–2015. Described mathematically, the proposed constrained linear function was defined according to the following formula:⁶¹

$$TARGET = \frac{1}{\min \left[\max \left(c \times FOOTPRINT + d, \frac{1}{a} \right), \frac{1}{b} \right]}$$

Where

TARGET = the fuel economy target (in mpg) applicable to vehicles of a given footprint (*FOOTPRINT*, in square feet),

a = the function's upper limit (in mpg),
b = the function's lower limit (in mpg),

⁵⁸ See 74 FR 14359 (Mar. 30, 2009).

⁵⁹ Production for sale in the United States.

⁶⁰ The equations are equivalent but are specified differently due to differences in the agencies' respective models.

⁶¹ This function is linear in fuel consumption but not in fuel economy.

c = the slope (in gpm per square foot) of the sloped portion of the function,

d = the intercept (in gpm) of the sloped portion of the function (that is, the value the sloped portion would take if extended to a footprint of 0 square feet, and the MIN and MAX functions take the

minimum and maximum, respectively, of the included values; for example, $MIN(1,2) = 1$, $MAX(1,2) = 2$, and $MIN[MAX(1,2),3] = 2$.

Because the format is linear on a gallons-per-mile basis, not on a miles-

per-gallon basis, it is plotted as fuel consumption below. Graphically, the constrained linear form appears as shown in Figure II.C-1.

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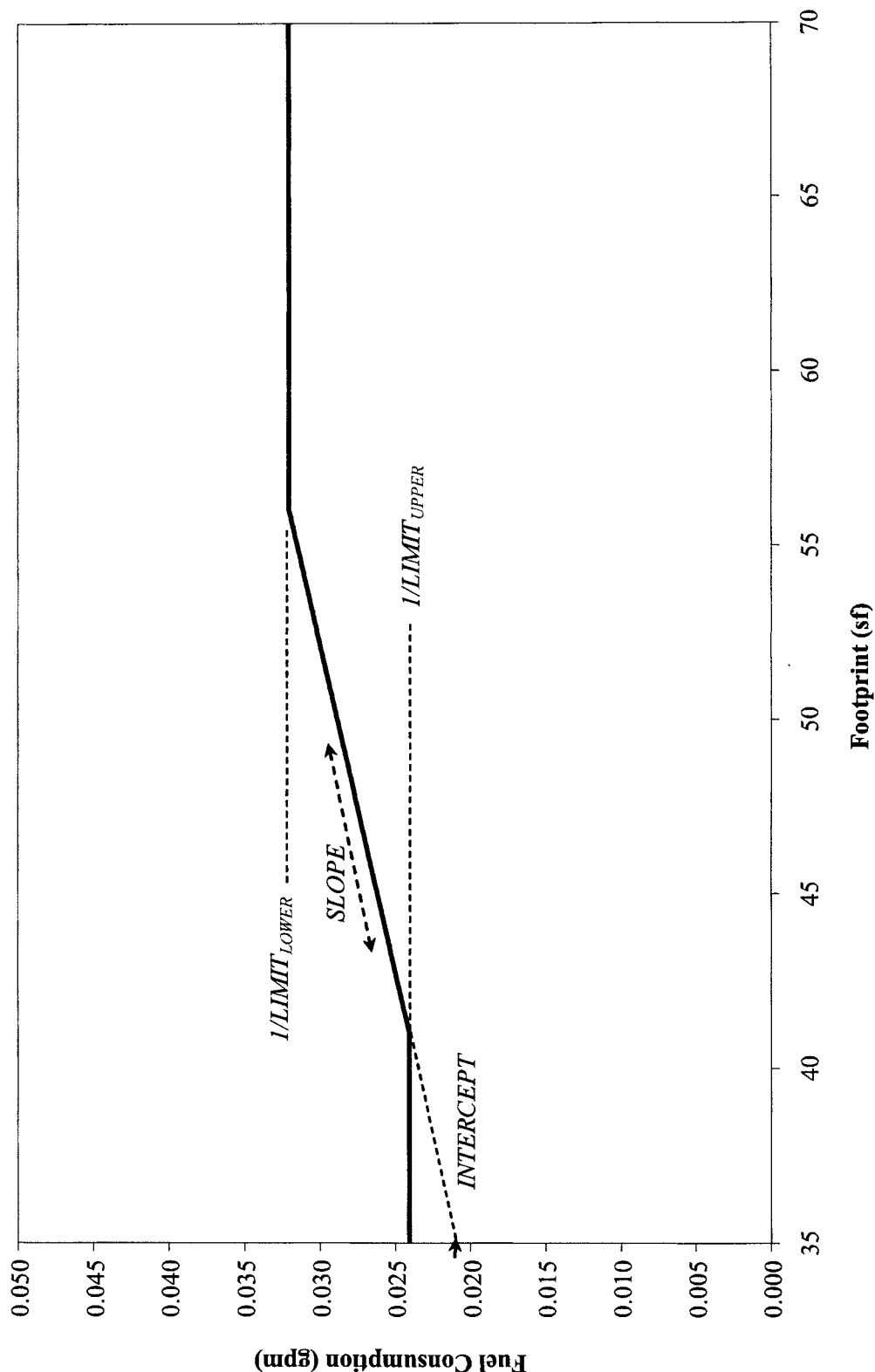


Figure II.C-1 The Shape of the Constrained Linear Form

The specific form and stringency for each fleet (passenger car and light trucks) and model year are defined through specific values for the four coefficients shown above.

EPA proposed the equivalent equation below for assigning CO₂ targets to an individual vehicle's footprint value. Although the general model of the equation is the same for each vehicle category and each year, the parameters of the equation differ for cars and trucks and for each model year. Described mathematically, EPA's proposed piecewise linear function was as follows:

Target = a, if $x \leq l$
 Target = $cx + d$, if $l < x \leq h$
 Target = b, if $x > h$

In the constrained linear form similar in form to the fuel economy equation above, this equation takes the simplified form:

Target = MIN [MAX ($c * x + d$, a), b]

Where

Target = the CO₂ target value for a given footprint (in g/mi)

a = the minimum target value (in g/mi CO₂)⁶²

⁶² These a, b, d coefficients differ from the a, b, d coefficients in the constrained linear fuel

b = the maximum target value (in g/mi CO₂)
 c = the slope of the linear function (in g/mi per sq ft CO₂)
 d = is the intercept or zero-offset for the line (in g/mi CO₂)
 x = footprint of the vehicle model (in square feet, rounded to the nearest tenth)
 l & h are the lower and higher footprint limits or constraints or ("kinks") or the boundary between the flat regions and the intermediate sloped line (in sq ft)

Graphically, piecewise linear form, like the constrained linear form, appears as shown in Figure II.C-2.

economy equation primarily by a factor of 8887 (plus an additive factor for air conditioning).

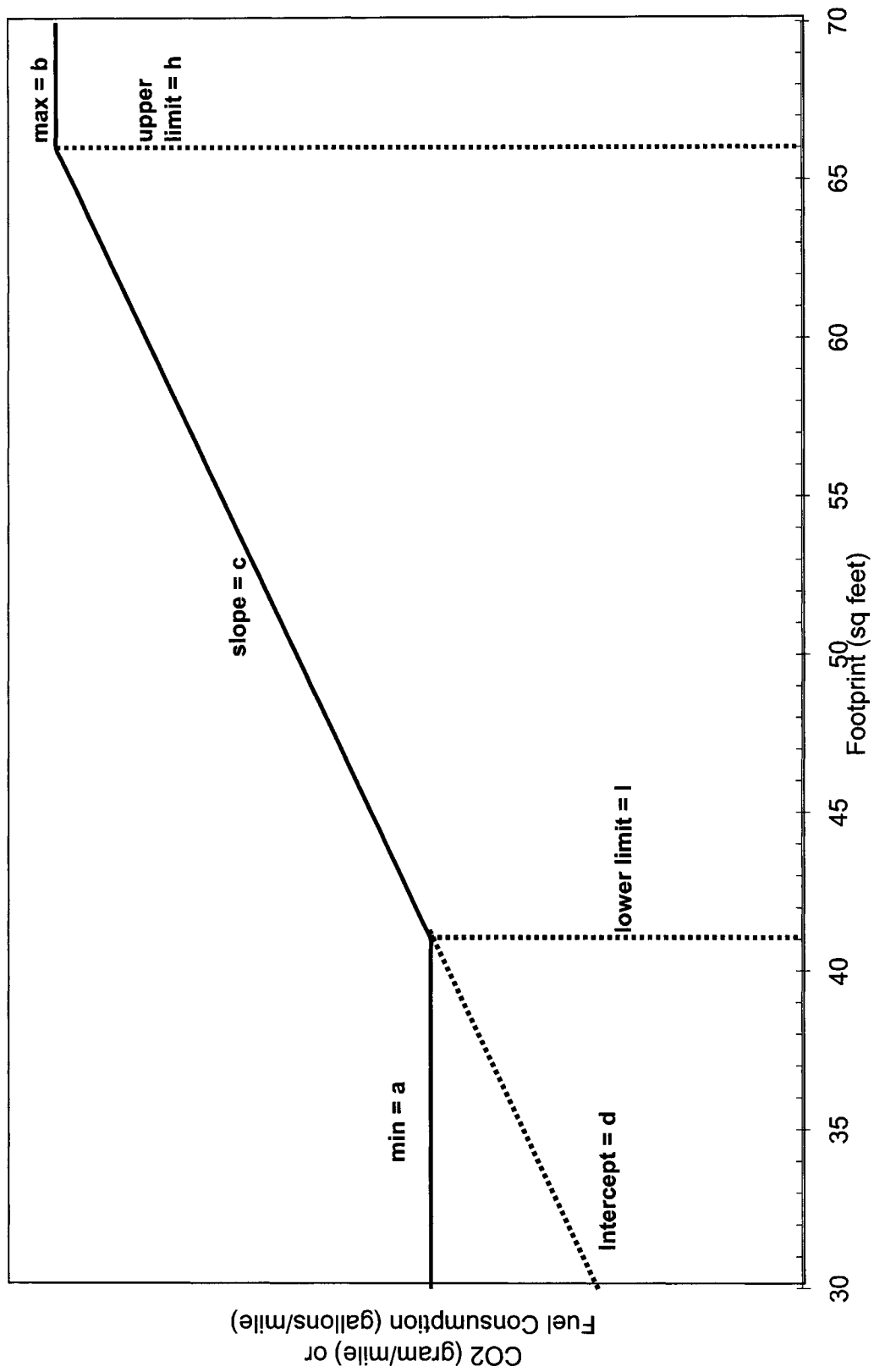


Figure II.C-2 The Shape of the Piecewise Linear Form

As for the constrained linear form, the specific form and stringency of the piecewise linear function for each fleet (passenger car and light trucks) and model year are defined through specific values for the four coefficients shown above.

For purposes of the proposed rules, NHTSA and EPA developed the basic curve shapes using methods similar to those applied by NHTSA in fitting the curves defining the MY 2011 standards. The first step involved defining the relevant vehicle characteristics in the form used by NHTSA's CAFE model (e.g., fuel economy, footprint, vehicle class, technology) described in Section II.B of this preamble and in Chapter 1 of the Joint TSD. However, because the baseline fleet utilizes a wide range of available fuel saving technologies, NHTSA used the CAFE model to develop a fleet to which all of the technologies discussed in Chapter 3 of the Joint TSD⁶³ were applied, except dieselization and strong hybridization. This was accomplished by taking the following steps: (1) Treating all manufacturers as unwilling to pay civil penalties rather than applying technology, (2) applying any technology at any time, irrespective of scheduled vehicle redesigns or freshening, and (3) ignoring "phase-in caps" that constrain the overall amount of technology that can be applied by the model to a given manufacturer's fleet. These steps helped to increase technological parity among vehicle models, thereby providing a better basis (than the baseline or reference fleets) for estimating the statistical relationship between vehicle size and fuel economy.

In fitting the curves, NHTSA and EPA also continued to fit the sloped portion of the function to vehicle models between the footprint values at which the agencies continued to apply constraints to limit the function's value for both the smallest and largest vehicles. Without a limit at the smallest footprints, the function—whether logistic or linear—can reach values that would be unfairly burdensome for a manufacturer that elects to focus on the market for small vehicles; depending on the underlying data, an unconstrained form, could result in stringency levels that are technologically infeasible and/or economically impracticable for those

manufacturers that may elect to focus on the smallest vehicles. On the other side of the function, without a limit at the largest footprints, the function may provide no floor on required fuel economy. Also, the safety considerations that support the provision of a disincentive for downsizing as a compliance strategy apply weakly, if at all, to the very largest vehicles. Limiting the function's value for the largest vehicles leads to a function with an inherent absolute minimum level of performance, while remaining consistent with safety considerations.

Before fitting the sloped portion of the constrained linear form, NHTSA and EPA selected footprints above and below which to apply constraints (*i.e.*, minimum and maximum values) on the function. The agencies believe that the linear form performs well in describing the observed relationship between footprint and fuel consumption or CO₂ emissions for vehicle models within the footprint ranges covering most vehicle models, but that the single (as opposed to piecewise) linear form does not perform well in describing this relationship for the smallest and largest vehicle models. For passenger cars, the agency noted that several manufacturers offer small, sporty coupes below 41 square feet, such as the BMW Z4 and Mini, Honda S2000, Mazda MX-5 Miata, Porsche Carrera and 911, and Volkswagen New Beetle. Because such vehicles represent a small portion (less than 10 percent) of the passenger car market, yet often have performance, utility, and/or structural characteristics that could make it technologically infeasible and/or economically impracticable for manufacturers focusing on such vehicles to achieve the very challenging average requirements that could apply in the absence of a constraint, EPA and NHTSA proposed to "cut off" the linear portion of the passenger car function at 41 square feet. The agencies recognize that for manufacturers who make small vehicles in this size range, this cut off creates some incentive to downsize (*i.e.*, further reduce the size, and/or increase the production of models currently smaller than 41 square feet) to make it easier to meet the target. The cut off may also create the incentive for manufacturers who do not currently offer such models to do so in the future. However, at the same time, the agencies believe that there is a limit to the market for cars smaller than 41 square feet—most consumers likely have some minimum expectation about interior volume, among other things. The agencies thus

believe that the number of consumers who will want vehicles smaller than 41 square feet (regardless of how they are priced) is small, and that the incentive to downsize in response to this final rule, if present, will be minimal. For consistency, the agency proposed to "cut off" the light truck function at the same footprint, although no light trucks are currently offered below 41 square feet. The agencies further noted that above 56 square feet, the only passenger car model present in the MY 2008 fleet were four luxury vehicles with extremely low sales volumes—the Bentley Arnage and three versions of the Rolls Royce Phantom. NHTSA and EPA therefore also proposed to "cut off" the linear portion of the passenger car function at 56 square feet. Finally, the agencies noted that although public information is limited regarding the sales volumes of the many different configurations (cab designs and bed sizes) of pickup trucks, most of the largest pickups (e.g., the Ford F-150, GM Sierra/Silverado, Nissan Titan, and Toyota Tundra) appear to fall just above 66 square feet in footprint. EPA and NHTSA therefore proposed to "cut off" the linear portion of the light truck function at 66 square feet.

Having developed a set of vehicle emissions and footprint data which represent the benefit of all non-diesel, non-hybrid technologies, we determined the initial values for parameters *c* and *d* were determined for cars and trucks separately. *c* and *d* were initially set at the values for which the average (equivalently, sum) of the absolute values of the differences was minimized between the "maximum technology" fleet fuel consumption (within the footprints between the upper and lower limits) and the straight line of the function defined above at the same corresponding vehicle footprints. That is, *c* and *d* were determined by minimizing the average absolute residual, commonly known as the MAD (Mean Absolute Deviation) approach, of the corresponding straight line.

Finally, NHTSA calculated the values of the upper and lower parameters (*a* and *b*) based on the corresponding footprints discussed above (41 and 56 square feet for passenger cars, and 41 and 66 square feet for light trucks).

The result of this methodology is shown below in Figures II.C-3 and II.C-4 for passenger cars and light trucks, respectively. The fitted curves are shown with the underlying "maximum technology" passenger car and light truck fleets. For passenger cars, the mean absolute deviation of the sloped portion of the function was 14 percent.

⁶³ The agencies excluded diesel engines and strong hybrid vehicle technologies from this exercise (and only this exercise) because the agencies expect that manufacturers would not need to rely heavily on these technologies in order to comply with the proposed standards. NHTSA and EPA did include diesel engines and strong hybrid vehicle technologies in all other portions of their analyses.

For trucks, the corresponding MAD was 10 percent.
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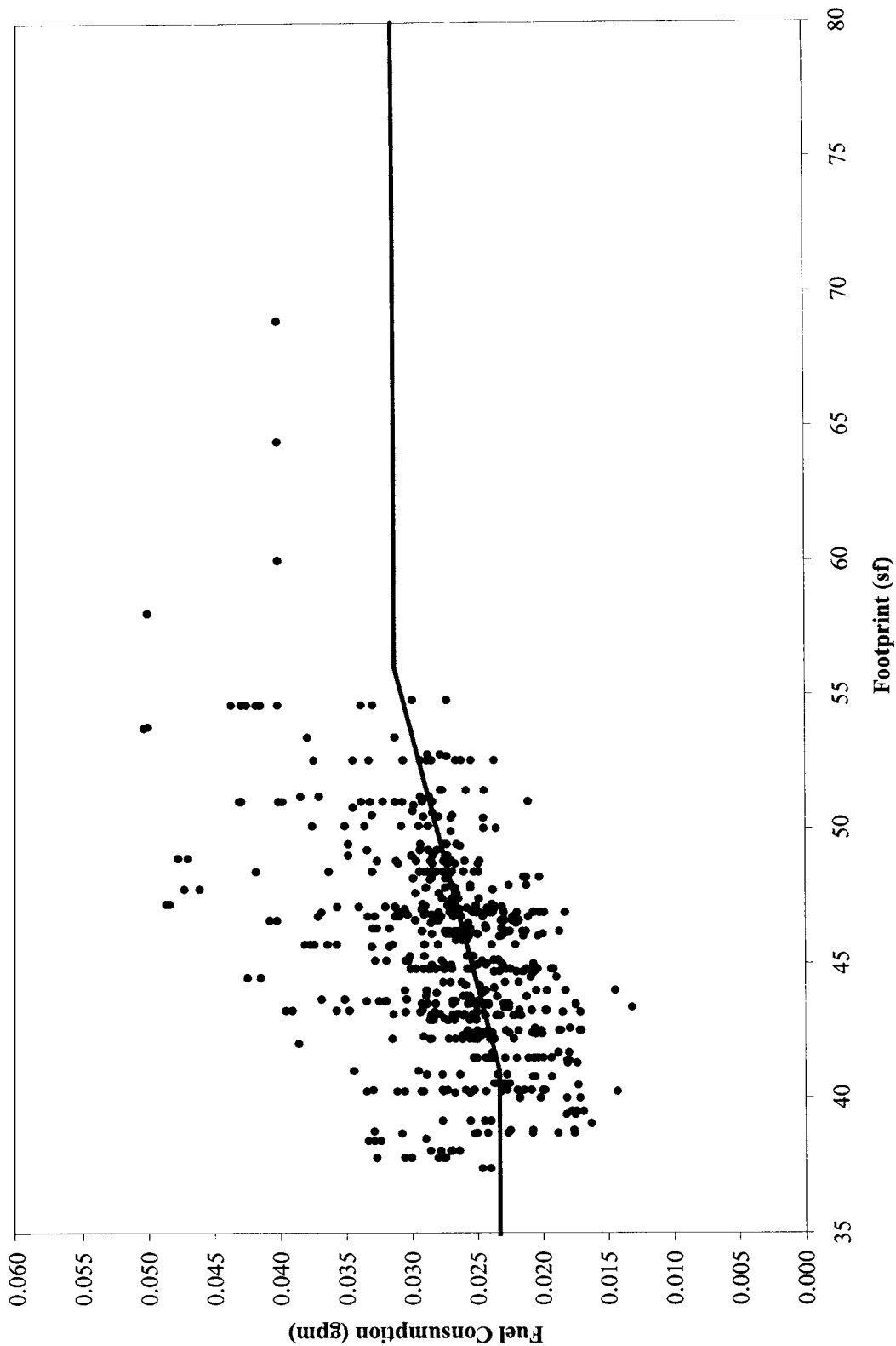


Figure II.C-3 “Maximum Technology” Passenger Fleet with Fitted Constrained Linear Function

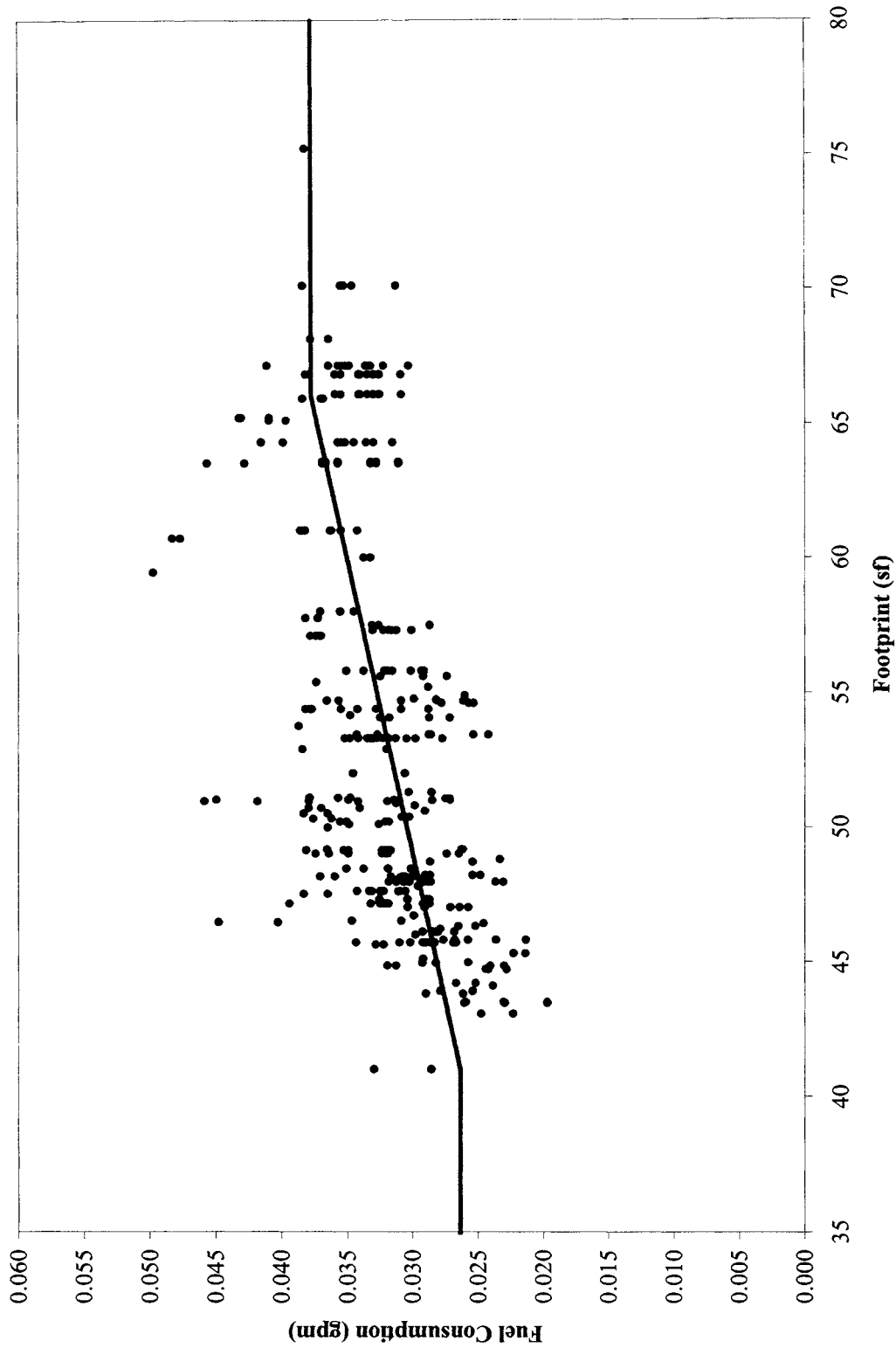


Figure II.C--4 "Maximum Technology" Light Truck with Fitted Constrained Linear Function

The agencies used these functional forms as a starting point to develop mathematical functions defining the actual proposed standards as discussed above. The agencies then transposed these functions vertically (*i.e.*, on a gpm or CO₂ basis, uniformly downward) to produce the same fleetwide fuel economy (and CO₂ emission levels) for cars and light trucks described in the NPRM.

A number of public comments generally supported the agencies' choice of attribute-based mathematical functions, as well as the methods applied to fit the function. Ferrari indicated support for the use of a constrained linear form rather than a constrained logistic form, support for the application of limits on the functions' values, support for a generally less steep passenger car curve compared to MY 2011, and support for the inclusion of all manufacturers in the analysis used to fit the curves. ICCT also supported the use of a constrained linear form. Toyota expressed general support for the methods and outcome, including a less-steep passenger car curve, and the application of limits on fuel economy targets applicable to the smallest vehicles. The UAW commented that the shapes and levels of the curves are reasonable.

Other commenters suggested that changes to the agencies' methods and results would yield better outcomes. GM suggested that steeper curves would provide a greater incentive for limited-line manufacturers to apply technology to smaller vehicles. GM argued that steeper and, in their view, fairer curves could be obtained by using sales-weighted least-squares regression rather than minimization of the unweighted mean absolute deviation. Conversely, students from UC Santa Barbara commented that the passenger car and light truck curves should be flatter and should converge over time in order to encourage the market to turn, as the agencies' analysis assumes it will, away from light trucks and toward passenger cars.

NADA commented that there should be no "cut-off" points (*i.e.*, lower limits or floors), because these *de facto* "backstops" might limit consumer choice, especially for light trucks—a possibility also suggested by the Alliance. The Alliance and several individual manufacturers also commented that the cut-off point for light trucks should be shifted to 72 square feet (from the proposed 66 square feet), arguing that the preponderance of high-volume light truck models with footprints greater than 66 square feet is such that a 72 square foot cut-off point

makes it unduly challenging for manufacturers serving the large pickup market and thereby constitutes a *de facto* backstop. Also, with respect to the smallest light truck models, Honda commented that the cut-off point should be set at the point defining the smallest 10 percent of the fleet, both for consistency with the passenger car cut-off point, and to provide a greater incentive for manufacturers to downsize the smallest light truck models (which provide greater functionality than passenger cars).

Other commenters focused on whether the agencies should have separate curves for different fleets or whether they should have a single curve that applied to both passenger cars and light trucks. This issue is related, to some extent, to commenters who discussed whether car and truck definitions should change. CARB, Ford, and Toyota supported separate curves for cars and trucks, generally stating that different fleets have different functional characteristics and these characteristics are appropriately addressed by separate curves. Likewise, AIAM, Chrysler, and NADA supported leaving the current definitions of car and truck the same. CBD, ICCT, and NESCAUM supported a single curve, based on concerns about manufacturers gaming the system and reclassifying passenger cars as light trucks in order to obtain the often-less stringent light truck standard, which could lead to lower benefits than anticipated by the agencies.

In addition, the students from UC Santa Barbara reported being unable to reproduce the agencies' analysis to fit curves to the passenger car and light truck fleets, even when using the model, inputs, and external analysis files posted to NHTSA's Web site when the NPRM was issued.

Having considered public comments, NHTSA and EPA have re-examined the development of curves underlying the standards proposed in the NPRM, and are promulgating standards based on the same underlying curves. The agencies have made this decision considering that, while EISA mandates that CAFE standards be defined by a mathematical function in terms of one or more attributes related to fuel economy, neither EISA nor the CAA require that the mathematical function be limited to the observed or theoretical dependence of fuel economy on the selected attribute or attributes. As a means by which CAFE and GHG standards are specified, the mathematical function can and does properly play a normative role. Therefore, NHTSA and EPA have concluded that, as supported by comments, the mathematical function

can reasonably be based on a blend of analytical and policy considerations, as discussed below and in the Joint Technical Support Document.

With respect to GM's recommendation that NHTSA and EPA use weighted least-squares analysis, the agencies find that the market forecast used for analysis supporting both the NPRM and the final rule exhibits the two key characteristics that previously led NHTSA to use minimization of the unweighted Mean Absolute Deviation (MAD) rather than weighted least-squares analysis. First, projected model-specific sales volumes in the agencies' market forecast cover an extremely wide range, such that, as discussed in NHTSA's rulemaking for MY 2011, while unweighted regression gives low-selling vehicle models and high-selling vehicle models equal emphasis, sales-weighted regression would give some vehicle models considerably more emphasis than other vehicle models.⁶⁴ The agencies' intention is to fit a curve that describes a technical relationship between fuel economy and footprint, given comparable levels of technology, and this supports weighting discrete vehicle models equally. On the other hand, sales weighted regression would allow the difference between other vehicle attributes to be reflected in the analysis, and also would reflect consumer demand.

Second, even after NHTSA's "maximum technology" analysis to increase technological parity of vehicle models before fitting curves, the agencies' market forecast contains many significant outliers. As discussed in NHTSA's rulemaking for MY 2011, MAD is a statistical procedure that has been demonstrated to produce more efficient parameter estimates than least-squares analysis in the presence of significant outliers.⁶⁵ In addition, the

⁶⁴ For example, the agencies' market forecast shows MY 2016 sales of 187,000 units for Toyota's 2WD Sienna, and shows 27 model configurations with MY 2016 sales of fewer than 100 units. Similarly, the agencies' market forecast shows MY 2016 sales of 268,000 for the Toyota Prius, and shows 29 model configurations with MY 2016 sales of fewer than 100 units. Sales-weighted analysis would give the Toyota Sienna and Prius more than a thousand times the consideration of many vehicle model configurations. Sales-weighted analysis would, therefore, cause a large number of vehicle model configurations to be virtually ignored. See discussion in NHTSA's final rule for MY 2011 passenger car and light truck CAFE standards, 74 FR 14368 (Mar. 30, 2009), and in NHTSA's NPRM for that rulemaking, 73 FR 24423–24429 (May 2, 2008).

⁶⁵ *Id.* In the case of a dataset not drawn from a sample with a Gaussian, or normal, distribution, there is often a need to employ robust estimation methods rather than rely on least-squares approach to curve fitting. The least-squares approach has as an underlying assumption that the data are drawn

agencies remain concerned that the steeper curves resulting from weighted least-squares analysis would increase the risk that energy savings and environmental benefits would be lower than projected, because the steeper curves would provide a greater incentive to increase sales of larger vehicles with lower fuel economy levels. Based on these technical considerations and these concerns regarding potential outcomes, the agencies have decided not to re-fit curves using weighted least-squares analysis, but note that they may reconsider using least-squares regression in future analysis.

NHTSA and EPA have considered GM's comment that steeper curves would provide a greater incentive for limited-line manufacturers to apply technology to smaller vehicles. While the agencies agree that a steeper curve would, absent any changes in fleet mix, tend to shift average compliance burdens away from GM and toward companies that make smaller vehicles, the agencies are concerned, as stated above, that steeper curves would increase the risk that induced increases in vehicle size could erode projected energy and environmental benefits.

NHTSA and EPA have also considered the comments by the students from UC Santa Barbara indicating that the passenger car and light truck curves should be flatter and should converge over time. The agencies conclude that flatter curves would reduce the incentives intended in shifting from "flat" CAFE standards to attribute-based CAFE and GHG standards—those being the incentive to respond to attribute-based standards in ways that minimize compromises in vehicle safety, and the incentive for more manufacturers (than primarily those selling a wider range of vehicles) across the range of the attribute to have to increase the application of fuel-saving technologies. With regard to whether the agencies should set separate curves or a single one, NHTSA also notes that

EPCA requires NHTSA to establish standards separately for passenger cars and light trucks, and thus concludes that the standards for each fleet should be based on the characteristics of vehicles in each fleet. In other words, the passenger car curve should be based on the characteristics of passenger cars, and the light truck curve should be based on the characteristics of light trucks—thus to the extent that those characteristics are different, an artificially-forced convergence would not accurately reflect those differences. However, such convergence could be appropriate depending on future trends in the light vehicle market, specifically further reduction in the differences between passenger car and light truck characteristics. While that trend was more apparent when car-like 2WD SUVs were classified as light trucks, it seems likely to diminish for the model year vehicles subject to these rules as the truck fleet will be more purely "truck-like" than has been the case in recent years.

NHTSA and EPA have also considered comments on the maxima and minima that the agencies have applied to "cut off" the linear function underlying the proposed curves for passenger cars and light trucks. Contrary to NADA's suggestion that there should be no such cut-off points, the agencies conclude that curves lacking maximum fuel economy targets (*i.e.*, minimum CO₂ targets) would result in average fuel economy and GHG requirements that would not be technologically feasible or economically practicable for manufacturers concentrating on those market segments. In addition, minimum fuel economy targets (*i.e.*, maximum CO₂ targets) are important to mitigate the risk to energy and environmental benefits of potential market shifts toward large vehicles. The agencies also disagree with comments by the Alliance and several individual manufacturers that the cut-off point for light trucks should be shifted to 72 square feet (from the proposed 66 square feet) to ease compliance burdens facing manufacturers serving the large pickup market. Such a shift would increase the risk that energy and environmental benefits of the standards would be compromised by induced increases in the sales of large pickups, in situations where the increased compliance burden is feasible and appropriate. Also, the agencies' market forecast suggests that most of the light trucks models with footprints larger than 66 square feet have curb weights near or above 5,000 pounds. This suggests, in turn, that in terms of highway safety, there is little or

no need to discourage downsizing of light trucks with footprints larger than 66 square feet. Based on these energy, environmental, technological feasibility, economic practicability, and safety considerations, the agencies conclude that the light truck curve should be cut off at 66 square feet, as proposed, rather than at 72 square feet. The agencies also disagree with Honda's suggestion that the cut-off point for the smallest trucks be shifted to a larger footprint value, because doing so could potentially increase the incentive to reclassify vehicles in that size range as light trucks, and could thereby increase the possibility that energy and environmental benefits of the rule would be less than projected.

Finally, considering comments by the UC Santa Barbara students regarding difficulties reproducing NHTSA's analysis, NHTSA reexamined its analysis, and discovered some erroneous entries in model inputs underlying the analysis used to develop the curves proposed in the NPRM. These errors are discussed in NHTSA's final Regulatory Impact Analysis (FRIA) and have since been corrected. They include the following: Incorrect valvetrain phasing and lift inputs for many BMW engines, incorrect indexing for some Daimler models, incorrectly enabled valvetrain technologies for rotary engines and Atkinson cycle engines, omitted baseline applications of cylinder deactivation in some Honda and GM engines, incorrect valve phasing codes for some 4-cylinder Chrysler engines, omitted baseline applications of advanced transmissions in some VW models, incorrectly enabled advanced electrification technologies for several hybrid vehicle models, and incorrect DCT effectiveness estimates for subcompact passenger cars. These errors, while not significant enough to impact the overall analysis of stringency, did affect the fitted slope for the passenger car curve and would have prevented precise replication of NHTSA's NPRM analysis by outside parties.

After correcting these errors and repeating the curve development analysis presented in the NPRM, NHTSA obtained the curves shown below in Figures II.C-5 and II.C-6 for passenger cars and light trucks, respectively. The fitted curves are shown with the underlying "maximum technology" passenger car and light truck fleets. For passenger cars, the mean absolute deviation of the sloped portion of the function was 14 percent. For trucks, the corresponding MAD was 10 percent.

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from a normal distribution, and hence fits a curve using a sum-of-squares method to minimize errors. This approach will, in a sample drawn from a non-normal distribution, give excessive weight to outliers by making their presence felt in proportion to the square of their distance from the fitted curve, and, hence, distort the resulting fit. With outliers in the sample, the typical solution is to use a robust method such as a minimum absolute deviation, rather than a squared term, to estimate the fit (*see, e.g.*, "AI Access: Your Access to Data Modeling," at http://www.aiaccess.net/English/Glossaries/GlosMod/e_gm_O_Pa.htm#Outlier). The effect on the estimation is to let the presence of each observation be felt more uniformly, resulting in a curve more representative of the data (*see, e.g.*, Peter Kennedy, *A Guide to Econometrics*, 3rd edition, 1992, MIT Press, Cambridge, MA).

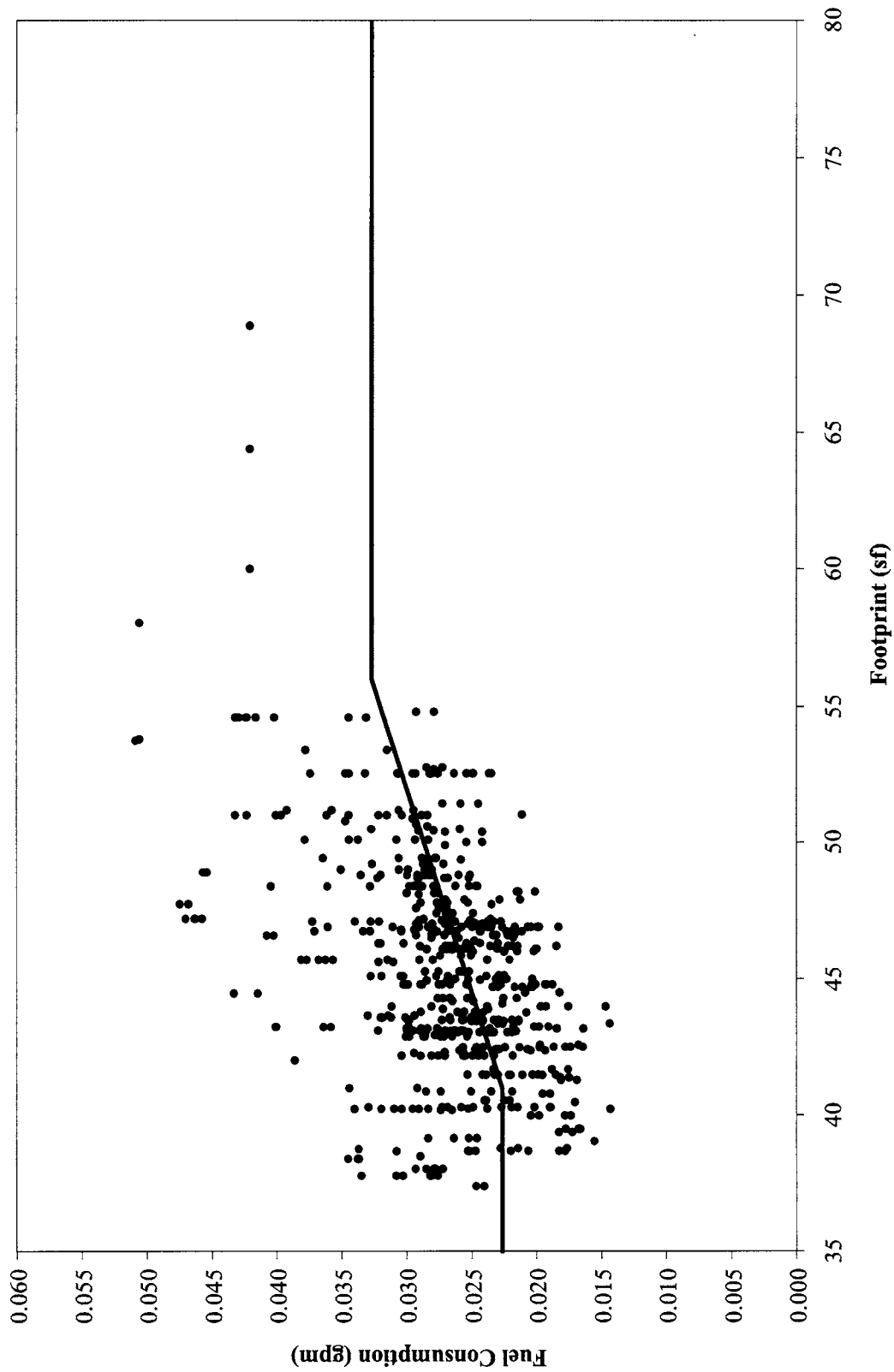


Figure II.C-5 Revised "Maximum Technology" Passenger Fleet with Fitted Constrained Linear Function

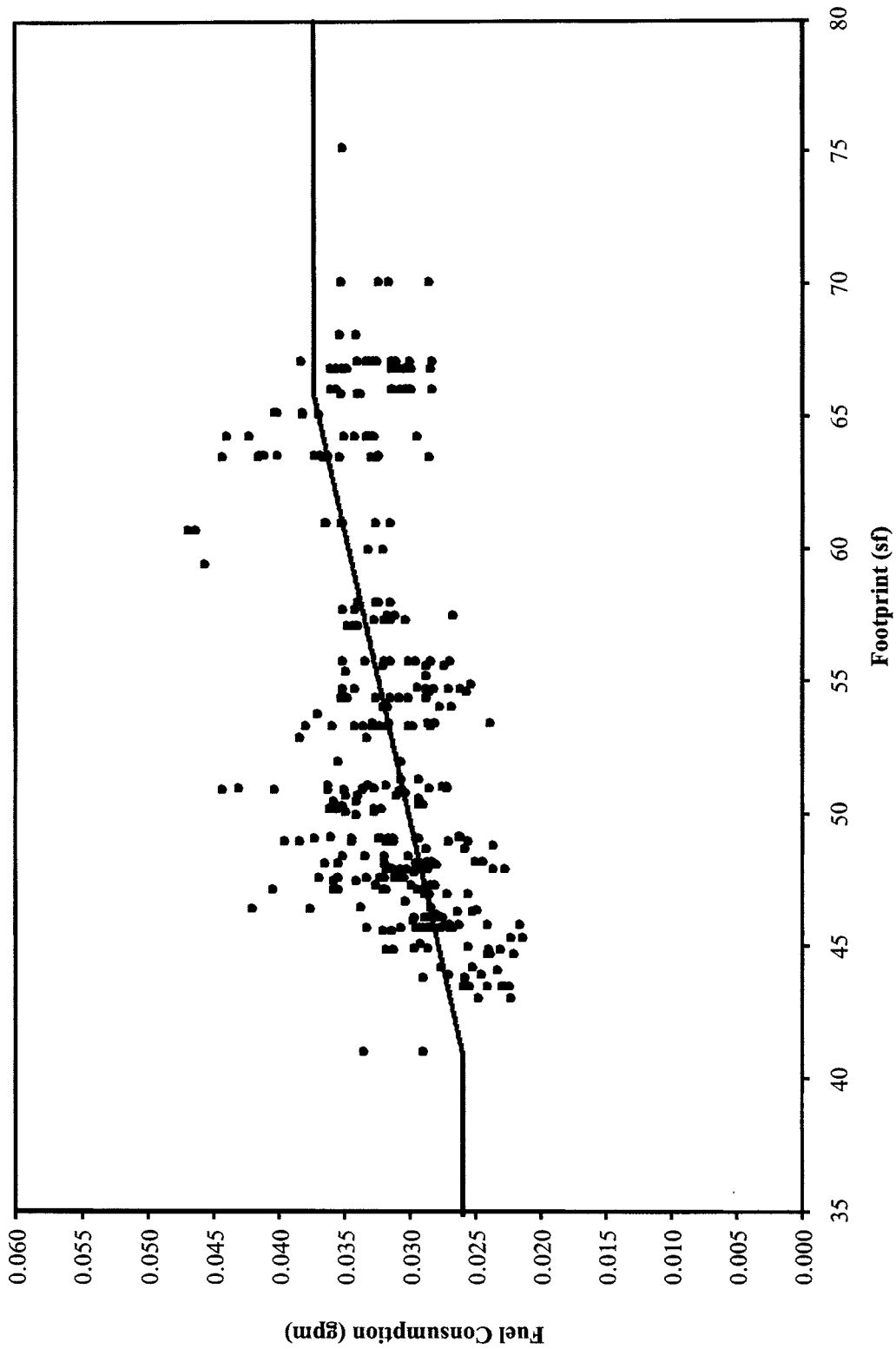


Figure II.C-6 Revised "Maximum Technology" Light Truck with Fitted Constrained Linear Function

This refitted passenger car curve is similar to that presented in the NPRM, and the refitted light truck curve is nearly identical to the corresponding curve in the NPRM. However, the slope of the refitted passenger car curve is about 27 percent steeper (on a gpm per sf basis) than the curve presented in the NPRM. For passenger cars and light trucks, respectively, Figures II.C-7 and II.C-8 show the results of adjustment—discussed in the next section—of the above curves to yield the average required fuel economy levels corresponding to the final standards.

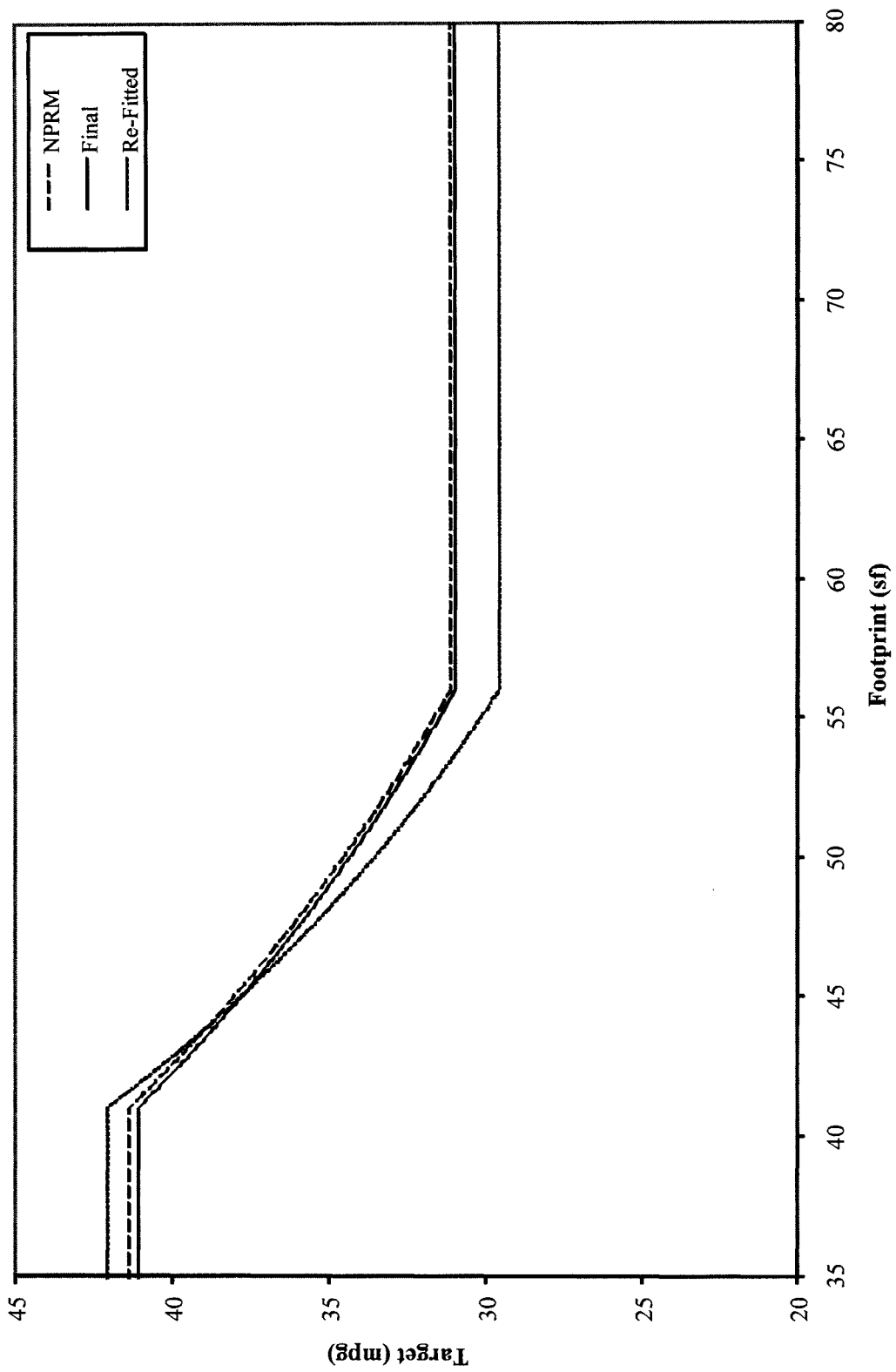


Figure II.C-7 MY 2016 Passenger Car Targets: NPRM, Final Rule, and if Using Re-Fitted Curve

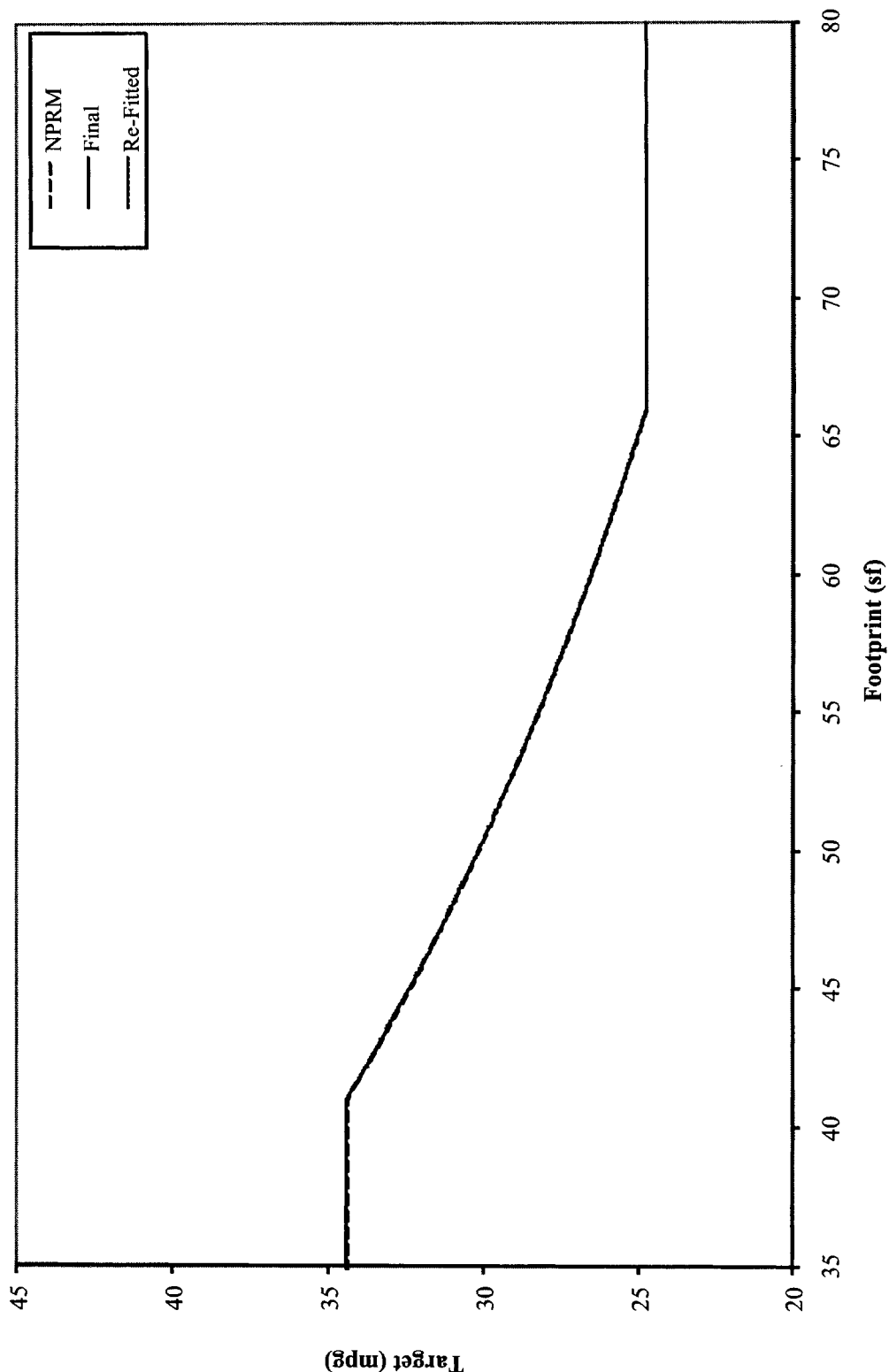


Figure II.C-8 MY 2016 Light Truck Targets: NPRM, Final Rule, and if Using Re-Fitted Curve

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While the resultant light truck curves are visually indistinguishable from one another, the refitted curve for passenger cars would increase stringency for the smallest cars, decrease stringency for the largest cars, and provide a greater incentive to increase vehicle size

throughout the range of footprints within which NHTSA and EPA project most passenger car models will be sold through MY 2016. The agencies are concerned that these changes would make it unduly difficult for manufacturers to introduce new small passenger cars in the United States, and

unduly risk losses in energy and environmental benefits by increasing incentives for the passenger car market to shift toward larger vehicles.

Also, the agencies note that the refitted passenger car curve produces only a slightly closer fit to the corrected fleet than would the curve estimated in

the NPRM; with respect to the corrected fleet (between the “cut off” footprint values, and after the “maximum technology” analysis discussed above), the mean absolute deviation for the refitted curve is 13.887 percent, and that of a refitted curve held to the original slope is 13.933 percent. In other words, the data support the original slope very nearly as well as they support the refitted slope.

Considering NHTSA’s and EPA’s concerns regarding the change in incentives that would result from a refitted curve for passenger cars, and considering that the data support the original curves about as well as they would support refitted curves, the agencies are finalizing CAFE and GHG standards based on the curves presented in the NPRM.

Finally, regarding some commenters’ inability to reproduce the agencies’ NPRM analysis, NHTSA believes that its correction of the errors discussed above and its release (on NHTSA’s Web site) of the updated Volpe model and all accompanying inputs and external analysis files should enable outside parties to independently reproduce the agencies’ analysis. If outside parties continue to experience difficulty in doing so, we encourage them to contact NHTSA, and the agency will do its best to provide assistance.

Thus, in summary, the agencies’ approach to developing the attribute-based mathematical functions for MY 2012–2016 CAFE and CO₂ standards represents the agencies’ best technical judgment and consideration of potential outcomes at this time, and we are confident that the conclusions have resulted in appropriate and reasonable standards. The agencies recognize, however, that aspects of these decisions may merit updating or revision in future analysis to support CAFE and CO₂ standards or for other purposes. Consistent with best rulemaking practices, the agencies will take a fresh look at all assumptions and approaches to curve fitting, appropriate attributes, and mathematical functions in the context of future rulemakings.

The agencies also recognized in the NPRM the possibility that lower fuel prices could lead to lower fleetwide fuel economy (and higher CO₂ emissions) than projected in this rule. One way of addressing that concern is through the use of a universal standard—that is, an average standard set at a (single) absolute level. This is often described as a “backstop standard.” The agencies explained that under the CAFE program, EISA requires such a minimum average fuel economy standard for domestic passenger cars, but is silent with regard

to similar backstops for imported passenger cars and light trucks, while under the CAA, a backstop could be adopted under section 202(a) assuming it could be justified under the relevant statutory criteria. NHTSA and EPA also noted that the flattened portions of the curves at the largest footprints directionally address the issue of a backstop (*i.e.*, the mpg “floor” or gpm “ceiling” applied to the curves provides a universal and absolute value for that range of footprints). The agencies sought comment on whether backstop standards, or any other method within the agencies’ statutory authority, should and can be implemented in order to guarantee a level of CO₂ emissions reductions and fuel savings under the attribute-based standards.

The agencies received a number of comments regarding the need for a backstop beyond NHTSA’s alternative minimum standard. Comments were divided fairly evenly between support for and opposition to additional backstop standards. The following organizations supported the need for EPA and NHTSA to have explicit backstop standards: American Council for an Energy Efficient Economy (ACEEE), American Lung Association, California Air Resources Board (CARB), Environment America, Environment Defense Fund, Massachusetts Department of Environmental Protection, Natural Resources Defense Council (NRDC), Northeast States for Coordinated Air Use Management (NESCAUM), Public Citizen and Safe Climate Campaign, Sierra Club, State of Washington Department of Ecology, Union of Concerned Scientists, and a number of private citizens. Commenters in favor of additional backstop standards for all fleets for both NHTSA and EPA⁶⁶ generally stated that the emissions reductions and fuel savings expected to be achieved by MY 2016 depended on assumptions about fleet mix that might not come to pass, and that various kinds of backstop standards or “ratchet mechanisms”⁶⁷ were necessary to ensure that those reductions were achieved in fact. In addition, some commenters⁶⁸ stated that manufacturers might build larger vehicles or more trucks during MYs

2012–2016 than the agencies project, for example, because (1) any amount of slope in target curves encourages manufacturers to upsize, and (2) lower targets for light trucks than for passenger cars encourage manufacturers to find ways to reclassify vehicles as light trucks, such as by dropping 2WD versions of SUVs and offering only 4WD versions, perhaps spurred by NHTSA’s reclassification of 2WD SUVs as passenger cars. Both of these mechanisms will be addressed further below. Some commenters also discussed EPA authority under the CAA to set backstops,⁶⁹ agreeing with EPA’s analysis that section 202(a) allows such standards since EPA has wide discretion under that section to craft standards.

The following organizations opposed a backstop: Alliance of Automobile Manufacturers (AAM), Association of International Automobile Manufacturers (AIAM), Ford Motor Company, National Automobile Dealers Association (NADA), Toyota Motor Company, and the United Auto Workers Union. Commenters stating that additional backstops would not be necessary disagreed that upsizing was likely,⁷⁰ and emphasized the anti-backsliding characteristics of the target curves. Others argued that universal absolute standards as backstops could restrict consumer choice of vehicles. Commenters making legal arguments under EPCA/EISA⁷¹ stated that Congress’ silence regarding backstops for imported passenger cars and light trucks should be construed as a lack of authority for NHTSA to create further backstops. Commenters making legal arguments under the CAA⁷² focused on the lack of clear authority under the CAA to create multiple GHG emissions standards for the same fleets of vehicles based on the same statutory criteria, and opposed EPA taking steps that would reduce harmonization with NHTSA in standard setting. Furthermore, AIAM indicated that EISA’s requirement that the combined (car and truck) fuel economy level reach at least 35 mpg by

⁶⁹ CARB, Public Citizen, Sierra Club *et al.*

⁷⁰ For example, the Alliance and Toyota said that upsizing would not be likely because (1) it would not necessarily make compliance with applicable standards easier, since larger vehicles tend to be heavier and heavier vehicles tend to achieve worse fuel economy/emissions levels; (2) it may require expensive platform changes; (3) target curves become increasingly more stringent from year to year, which reduces the benefits of upsizing; and (4) the mpg floor and gpm ceiling for the largest vehicles (the point at which the curve is “cut off”) discourages manufacturers from continuing to upsize beyond a point because doing so makes it increasingly difficult to meet the flat standard at that part of the curve.

⁷¹ AIAM, Alliance, Ford, NADA, Toyota.

⁷² Alliance, Ford, NADA, UAW.

⁶⁶ ACEEE, American Lung Association, CARB, Christopher Lish, Environment America, EDF, MA DEP, NRDC, NESCAUM, Public Citizen, Sierra Club *et al.*, SCAQMD, UCS, WA DE.

⁶⁷ Commenters generally defined a “ratchet mechanism” as an automatic re-calculation of stringency to ensure cumulative goals are reached by 2016, even if emissions reductions and fuel savings fall short in the earlier years covered by the rulemaking.

⁶⁸ CBD, MA DEP, NJ DEP, Public Citizen, Sierra Club *et al.*, UCS.

2020 itself constitutes a backstop.⁷³ One individual⁷⁴ commented that while additional backstop standards might be necessary given optimism of fleet mix assumptions, both agencies' authorities would probably need to be revised by Congress to clarify that backstop standards (whether for individual fleets or for the national fleet as a whole) were permissible.

In response, EPA and NHTSA remain confident that their projections of the future fleet mix are reliable, and that future changes in the fleet mix of footprints and sales are not likely to lead to more than modest changes in projected emissions reductions or fuel savings.⁷⁵ Both agencies thus remain confident in these fleet projections and the resulting emissions reductions and fuel savings from the standards. As explained in Section II.B above, the agencies' projections of the future fleet are based on the most transparent information currently available to the agencies. In addition, there are only a relatively few model years at issue. Moreover, market trends today are

consistent with the agencies' estimates, showing shifts from light trucks to passenger cars and increased emphasis on fuel economy from all vehicles.

Finally, the shapes of the curves, including the "flattening" at the largest footprint values, tend to avoid or minimize regulatory incentives for manufacturers to upsize their fleet to change their compliance burden. Given the way the curves are fit to the data points (which represent vehicle models' fuel economy mapped against their footprint), the agencies believe that there is little real benefit to be gained by a manufacturer upsizing their vehicles. As discussed above, the agencies' analysis indicates that, for passenger car models with footprints falling between the two flattened portions of the corresponding curve, the actual slope of fuel economy with respect to footprint, if fit to that data by itself, is about 27 percent steeper than the curve the agencies are promulgating today. This difference suggests that manufacturers would, if anything, have more to gain by reducing vehicle footprint than by increasing vehicle footprint. For light trucks, the agencies' analysis indicates that, for models with footprints falling between the two flattened portions of the corresponding curve, the slope of fuel economy with respect to footprint is nearly identical to the curve the agencies are promulgating today. This suggests that, within this range, manufacturers would typically have little incentive to either incrementally increase or reduce vehicle footprint. The agencies recognize that based on economic and consumer demand factors that are external to this rule, the distribution of footprints in the future may be different (either smaller or larger) than what is projected in this rule. However, the agencies continue to believe that there will not be significant shifts in this distribution as a direct consequence of this rule.

At the same time, adding another backstop standard would have virtually no effect if the standard was weak, but a more stringent backstop could compromise the objectives served by attribute-based standards—that they distribute compliance burdens more equally among manufacturers, and at the same time encourage manufacturers to apply fuel-saving technologies rather than simply downsizing their vehicles, as they did in past decades under flat standards. This is why Congress mandated attribute-based CAFE standards in EISA. This compromise in objectives could occur for any manufacturer whose fleet average was above the backstop, irrespective of why they were above the backstop and

irrespective of whether the industry as a whole was achieving the emissions and fuel economy benefits projected for the final standards, the problem the backstop is supposed to address. For example, the projected industry wide level of 250 gm/mile for MY 2016 is based on a mix of manufacturer levels, ranging from approximately 205 to 315 gram/mile⁷⁶ but resulting in an industry wide basis in a fleet average of 250 gm/mile. Unless the backstop was at a very weak level, above the high end of this range, then some percentage of manufacturers would be above the backstop even if the performance of the entire industry remains fully consistent with the emissions and fuel economy levels projected for the final standards. For these manufacturers and any other manufacturers who were above the backstop, the objectives of an attribute based standard would be compromised and unnecessary costs would be imposed. This could directionally impose increased costs for some manufacturers. It would be difficult if not impossible to establish the level of a backstop standard such that costs are likely to be imposed on manufacturers only when there is a failure to achieve the projected reductions across the industry as a whole. An example of this kind of industry wide situation could be when there is a significant shift to larger vehicles across the industry as a whole, or if there is a general market shift from cars to trucks. The problem the agencies are concerned about in those circumstances is not with respect to any single manufacturer, but rather is based on concerns over shifts across the fleet as a whole, as compared to shifts in one manufacturer's fleet that may be more than offset by shifts the other way in another manufacturer's fleet. However, in this respect, a traditional backstop acts as a manufacturer specific standard.

The concept of a ratchet mechanism recognizes this problem, and would impose the new more stringent standard only when the problem arises across the industry as a whole. While the new more stringent standards would enter into force automatically, any such standards would still need to provide adequate lead time for the manufacturers. Given the limited number of model years covered by this rulemaking and the short lead-time already before the 2012 model year, a ratchet mechanism in this rulemaking that would automatically tighten the standards at some point after model year 2012 is finished and apply the new more stringent standards for model

⁷³ NHTSA and EPA agree with AIAM that the EISA 35 mpg requirement in MY 2020 has a backstop-like function, in that it requires a certain level of achieved fleetwide fuel economy by a certain date, although it is not literally a backstop standard. Considering that NHTSA's MY 2011 CAFE standards increased projected average fuel economy requirements (relative to the MY 2010 standards) at a significantly faster rate than would be required to achieve the 35-in-2020 requirement, and considering that the standards being finalized today would increase projected average combined fuel economy requirements to 34.1 mpg in MY 2016, four years before MY 2020, the agencies believe that the U.S. vehicle market would have to shift in highly unexpected ways in order to put the 35-in-2020 requirement at risk, even despite the fact that due to the attribute-based standards, average fuel economy requirements will vary depending on the mix of vehicles produced for sale in the U.S. in each model year. The agencies further emphasize that both NHTSA and EPA plan to conduct and document retrospective analyses to evaluate how the market's evolution during the rulemaking timeframe compares with the agencies' forecasts employed for this rulemaking. Additionally, we emphasize that both agencies have the authority, given sufficient lead time, to revise their standards upwards if necessary to avoid missing the 35-in-2020 requirement.

⁷⁴ Schade.

⁷⁵ For reference, NHTSA's March 2009 final rule establishing MY 2011 CAFE standards was based on a forecast that passenger cars would represent 57.6 percent of the MY 2011 fleet, and that MY 2011 passenger cars and light trucks would average 45.6 square feet (sf) and 55.1 sf, respectively, such that average required CAFE levels would be 30.2 mpg, 24.1 mpg, and 27.3 mpg, respectively, for passenger cars, light trucks, and the overall light-duty fleet. Based on the agencies' current market forecast, even as soon as MY 2011, passenger cars will comprise a larger share (59.2 percent) of the light vehicle market; passenger cars and light trucks will, on average, be smaller by 0.5 sf and 1.3 sf, respectively; and average required CAFE levels will be higher by 0.2 mpg, 0.3 mpg, and 0.3 mpg, respectively, for passenger cars, light trucks, and the overall light-duty fleet.

⁷⁶ Based on estimated standards presented in Tables III.B.1-1 and III.B.1-2.

years 2016 or earlier, would fail to provide adequate lead time for any new, more stringent standards.

Additionally, we do not believe that the risk of vehicle upsizing or changing vehicle offerings to “game” the passenger car and light truck definitions is as great as commenters imply for the model years in question.⁷⁷ The changes that commenters suggest manufacturers might make are neither so simple nor so likely to be accepted by consumers. For example, 4WD versions of vehicles tend to be more expensive and, other things being equal, have inherently lower fuel economy than their 2WD equivalent models. Therefore, although there is a market for 4WD vehicles, and some consumers might shift from 2WD vehicles to 4WD vehicles if 4WD becomes available at little or no extra cost, many consumers still may not desire to purchase 4WD vehicles because of concerns about cost premium and additional maintenance requirements; conversely, many manufacturers often require the 2WD option to satisfy demand for base vehicle models. Additionally, increasing the footprint of vehicles requires platform changes, which usually requires a product redesign phase (the agencies estimate that this occurs on average once every 5 years for most models). Alternatively, turning many 2WD SUVs into 2WD light trucks would require manufacturers to squeeze a third row of seats in or significantly increase their GVWR, which also requires a significant change in the vehicle.⁷⁸ The agencies are confident that the anticipated increases in average fuel economy and reductions in average CO₂ emission rates can be achieved without backstops under EISA or the CAA. As noted above, the agencies plan to conduct retrospective analysis to

monitor progress. Both agencies have the authority to revise standards if warranted, as long as sufficient lead time is provided.

The agencies acknowledge that the MY 2016 fleet emissions and fuel economy goals of 250 g/mi and 34.1 mpg for EPA and NHTSA respectively are estimates and not standards (the MY 2012–2016 curves are the standards). Changes in fuel prices, consumer preferences, and/or vehicle survival and mileage accumulation rates could result in either smaller or larger oil and GHG savings. As explained above and elsewhere in the rule, the agencies believe that the possibility of not meeting (or, alternatively, exceeding) fuel economy and emissions goals exists, but is not likely. Given this, and given the potential complexities in designing an appropriate backstop, the agencies believe the balance here points to not adopting additional backstops at this time for the MYs 2012–2016 standards other than NHTSA’s finalizing of the ones required by EPCA/EISA for domestic passenger cars. Nevertheless, the agencies recognize there are many factors that are inherently uncertain which can affect projections in the future, including fuel price and other factors which are unrelated to the standards contained in this final rule. Such factors can affect consumer preferences and are difficult to predict. At this time and based on the available information, the agencies have not included a backstop for model years 2012–2016. However, if circumstances change in the future in unanticipated ways, the agencies may revisit the issue of a backstop in the context of a future rulemaking either for model years 2012–2016 or as needed for standards for model years beyond 2016. This issue will be discussed further in Sections III and IV.

D. Relative Car-Truck Stringency

The agencies proposed fleetwide standards with the projected levels of stringency of 34.1 mpg or 250 g/mi in MY 2016 (as well as the corresponding intermediate year fleetwide standards) for NHTSA and EPA respectively. To determine the relative stringency of passenger car and light truck standards for those model years, the agencies were concerned that increasing the difference between the car and truck standards

(either by raising the car standards or lowering the truck standards) could encourage manufacturers to build fewer cars and more trucks, likely to the detriment of fuel economy and CO₂ reductions.⁷⁹ In order to maintain consistent car/truck standards, the agencies applied a constant ratio between the estimated average required performance under the passenger car and light truck standards, in order to maintain a stable set of incentives regarding vehicle classification.

To calculate relative car-truck stringency for the proposal, the agencies explored a number of possible alternatives, and for the reasons described in the proposal used the Volpe model in order to estimate stringencies at which net benefits would be maximized. The agencies have followed the same approach in calculating the relative car-truck stringency for the final standards promulgated today. Further details of the development of this approach can be found in Section IV of this preamble as well as in NHTSA’s RIA and EIS. NHTSA examined passenger car and light truck standards that would produce the proposed combined average fuel economy levels from Table I.B.2–2 above. NHTSA did so by shifting downward the curves that maximize net benefits, holding the relative stringency of passenger car and light truck standards constant at the level determined by maximizing net benefits, such that the average fuel economy required of passenger cars remained 31 percent higher than the average fuel economy required of light trucks. This methodology resulted in the average fuel economy levels for passenger cars and light trucks during MYs 2012–2016 as shown in Table I.B.1–1. The following chart illustrates this methodology of shifting the standards from the levels maximizing net benefits to the levels consistent with the combined fuel economy standards in this final rule.

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⁷⁹ For example, since many 2WD SUVs are classified as passenger cars, manufacturers have already warned that high car standards relative to truck standards could create an incentive for them to drop the 2WD version and sell only the 4WD version.

⁷⁷ We note that NHTSA’s recent clarification of the light truck definitions has significantly reduced the potential for gaming, and resulted in the reclassification of over a million vehicles from the light truck to the passenger car fleet.

⁷⁸ Increasing the GVWR of a light truck (assuming this was the only goal) can be accomplished in a number of ways, and must include consideration of: (1) Redesign of wheel axles; (2) improving the vehicle suspension; (3) changes in tire specification (which will likely affect ride quality); (4) vehicle dynamics development (especially with vehicles equipped with electronic stability control); and (5) brake redesign. Depending on the vehicle, some of these changes may be easier or more difficult than others.

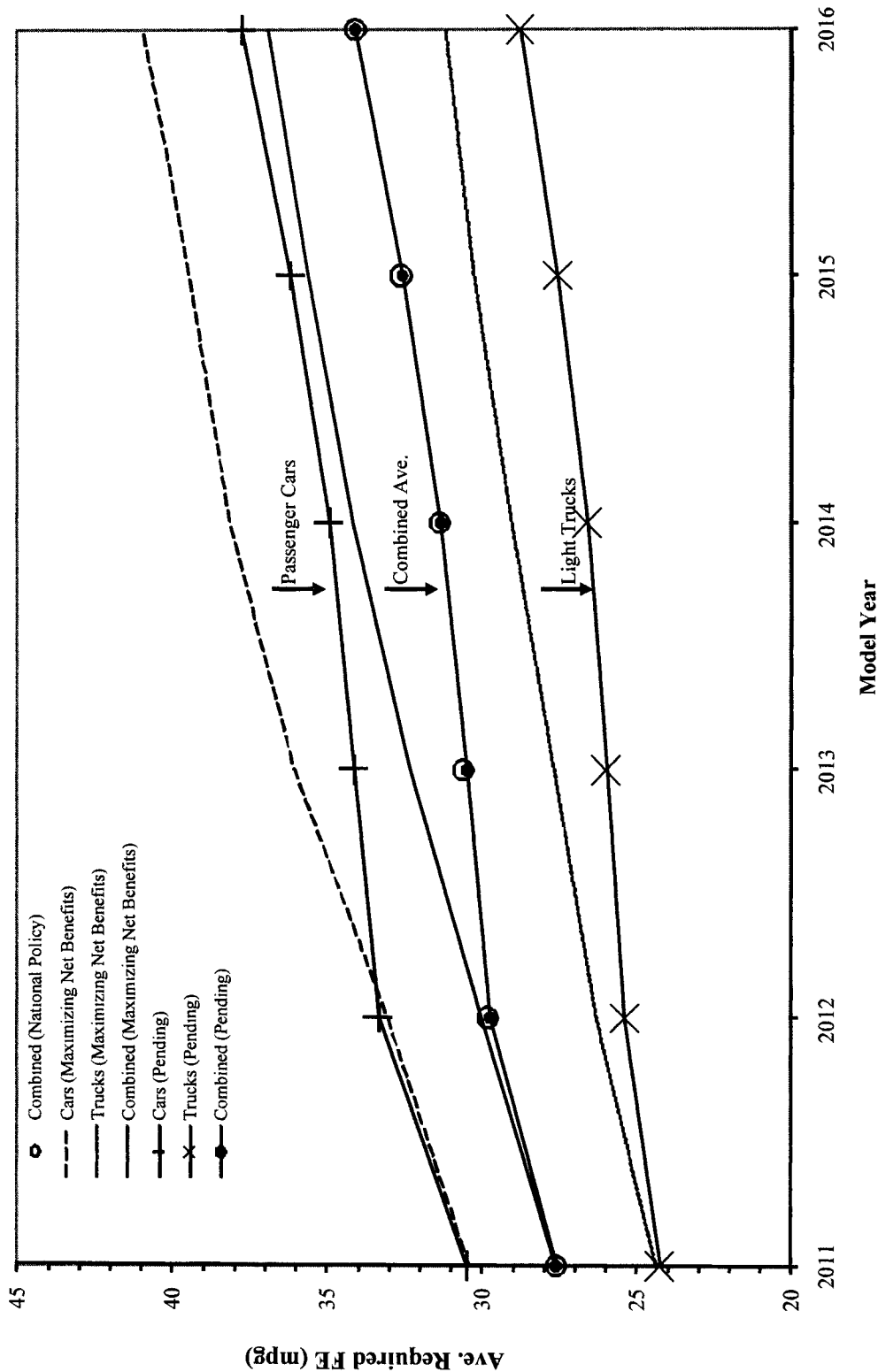


Figure II.D-1 Shifting the Standards from the Maximizing Net Benefit Levels to the Levels Consistent with the Combined Fuel Economy Standards in this Rule

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The final car and truck standards for EPA (Table I.B.1-4 above) were subsequently determined by first converting the average required fuel economy levels to average required CO₂

emission rates, and then applying the expected air conditioning credits for 2012-2016. These A/C credits are shown in the following table. Further details of the derivation of these factors

can be found in Section III of this preamble or in the EPA RIA.

⁸⁰ We assume slightly higher A/C penetration in 2012 than was assumed in the proposal only to

Continued

TABLE II.D–1 EXPECTED FLEET A/C CREDITS (IN CO₂ EQUIVALENT g/mi) FROM 2012–2016

	Average technology penetration (%)	Average credit for cars	Average credit for trucks	Average credit for combined fleet
2012	80	3.4	3.8	3.5
2013	40	4.8	5.4	5.0
2014	60	7.2	8.1	7.5
2015	80	9.6	10.8	10.0
2016	85	10.2	11.5	10.6

The agencies sought comment on the use of this methodology for apportioning the fleet stringencies to relative car and truck standards for 2012–2016. General Motors commented that, compared to the passenger car standard, the light truck standard is too stringent because “the most fuel efficient cars and small trucks already meet the 2016 MY requirements” but “the most fuel efficient large trucks must increase fuel economy by 20 percent to meet the 2016 MY requirements.” GM recommended that the agencies relax stringency specifically for large pickups, such as the Silverado.

The agencies disagree with the premise of the comment that the standard is too stringent under the applicable statutory provisions because some existing large trucks are not already meeting a later model year standard. Our analysis shows that the standards are not too stringent for manufacturers selling these vehicles. The agencies’ analyses demonstrate a means by which manufacturers could apply cost-effective technologies in order to achieve the standards, and we have provided adequate lead time for the technology to be applied. More important, the agencies’ analysis demonstrate that the fleetwide emission standards for MY 2016 are technically feasible, for example by implementing technologies such as engine downsizing, turbocharging, direct injection, improving accessories and tire rolling resistance, etc.

GM did not comment on the use of the methodology applied by the agencies to develop the gap between the passenger car and light truck standards—only on the outcome of the

methodology. For the reasons discussed below, the agencies maintain that the methodology applied above provides an appropriate basis to determine the gap between the passenger car and light truck standards, and disagree with GM’s arguments that the outcome is unfair.

First, GM’s argument incorrectly suggests that every individual vehicle model must achieve its fuel economy and emissions targets. CAFE standards and new GHG emissions standards apply to fleetwide average performance, not model-specific performance, even though average required levels are based on average model-specific targets, and the agencies’ analysis demonstrates that GM and other manufacturers of large trucks can cost-effectively comply with the new standards.

Second, GM implies that every manufacturer must be challenged equally with respect to fuel economy and emissions. Although NHTSA and EPA maintain that attribute-based CAFE and GHG emissions standards can more evenly balance compliance challenges, attribute-based standards are not intended to and cannot make these challenges equal, and while the agencies are mindful of the potential impacts of the standards on the relative competitiveness of different vehicle manufacturers, there is nothing in EPCA or the CAA⁸¹ requiring that these challenges be equal.

We have also already addressed and rejected GM’s suggestion of shifting the “cut off” point for light trucks from 66 square feet to 72 square feet, thereby “dropping the floor” of the target function for light trucks. As discussed in the preceding section, this is so as not to forego the rules’ energy and

environmental benefits, and because there is little or no safety basis to discourage downsizing of the largest light trucks.

Finally, NHTSA and EPA disagree with GM’s claim that the outcome of the agencies’ approach is unfairly burdensome for light trucks as compared to passenger cars. Based on the agencies’ market forecast, NHTSA’s analysis indicates that incremental technology outlays could, on average, be comparable for passenger cars and light trucks under the final CAFE standards, and further indicates that the ratio of total benefits to total costs could be greater under the final light truck standards than under the final passenger car standards.

E. Joint Vehicle Technology Assumptions

Vehicle technology assumptions, *i.e.*, assumptions about technologies’ cost, effectiveness, and the rate at which they can be incorporated into new vehicles, are often controversial as they have a significant impact on the levels of the standards. The agencies must, therefore, take great care in developing and justifying these estimates. In developing technology inputs for the analysis of the MY 2012–2016 standards, the agencies reviewed the technology assumptions that NHTSA used in setting the MY 2011 standards, the comments that NHTSA received in response to its May 2008 Notice of Proposed Rulemaking (NPRM), and the comments received in response to the NPRM for this rule. This review is consistent with the request by President Obama in his January 26 memorandum to DOT. In addition, the agencies reviewed the technology input

correct for rounding that occurred in the curve setting process.

⁸¹ As NHTSA explained in the NPRM, the Conference Report for EPCA, as enacted in 1975, makes clear, and the case law affirms, “a determination of maximum feasible average fuel economy should not be keyed to the single manufacturer which might have the most difficulty achieving a given level of average fuel economy.” *CEI-I*, 793 F.2d 1322, 1352 (D.C. Cir. 1986). Instead, NHTSA is compelled “to weigh the benefits to the nation of a higher fuel economy standard against

the difficulties of individual automobile manufacturers.” *Id.* The law permits CAFE standards exceeding the projected capability of any particular manufacturer as long as the standard is economically practicable for the industry as a whole. Similarly, EPA is afforded great discretion under section 202(a) of the CAA to balance issues of technical feasibility, cost, adequacy of lead time, and safety, and certainly is not required to do so in a manner that imposes regulatory obligations uniformly on each manufacturer. *See NRDC v. EPA*, 655 F.2d 318, 322, 328 (D.C. Cir. 1981) (wide discretion afforded by the statutory factors, and

EPA predictions of technical feasibility afforded considerable discretion subject to constraints of reasonableness EPA predictions of technical feasibility afforded considerable discretion subject to constraints of reasonableness); and cf. *International Harvester Co. v. Ruckelshaus*, 479 F.2d 615, 640 (D.C. Cir. 1973) (“as long as feasible technology permits the demand for new passenger automobiles to be generally met, the basic requirements of the Act would be satisfied, even though this might occasion fewer models and a more limited choice of engine types”).

RULE 3

**75 Fed. Reg. 17,004
(Apr. 2, 2010)
(Triggering Rule)**



Federal Register

**Friday,
April 2, 2010**

Part V

Environmental Protection Agency

**40 CFR Parts 50, 51, 70, and 71
Reconsideration of Interpretation of
Regulations That Determine Pollutants
Covered by Clean Air Act Permitting
Programs; Final Rule**

ENVIRONMENTAL PROTECTION AGENCY**40 CFR Parts 50, 51, 70, and 71**

[EPA-HQ-OAR-2009-0597; FRL-9133-6]

RIN 2060-AP87

Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting Programs**AGENCY:** Environmental Protection Agency.**ACTION:** Final Action on Reconsideration of Interpretation.

SUMMARY: EPA has made a final decision to continue applying the Agency's existing interpretation of a regulation that determines the scope of pollutants subject to the Federal Prevention of Significant Deterioration (PSD) program under the Clean Air Act (CAA or Act). In a December 18, 2008 memorandum, EPA established an interpretation clarifying the scope of the phrase "subject to regulation" found within the definition of the term "regulated NSR pollutant." After considering comments on alternate interpretations of this term, EPA has decided to continue to interpret it to include each pollutant subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant. Thus, this action explains that EPA will continue following the interpretation in the December 18, 2008 memorandum with one exception. EPA is refining its interpretation to establish that the PSD permitting requirements will not apply to a newly regulated pollutant until a regulatory requirement to control emissions of that pollutant "takes effect." In addition, this notice addresses several questions regarding the applicability of the PSD and Title V permitting programs to greenhouse gases (GHGs) upon the anticipated promulgation of EPA regulations establishing limitations on emissions of GHGs from vehicles under Title II of the CAA. Collectively, these conclusions result in an EPA determination that PSD and Title V permitting requirements will not apply to GHGs until at least January 2, 2011.

DATES: This final action is applicable as of March 29, 2010.

FOR FURTHER INFORMATION CONTACT: Mr. David Svendsgaard, Air Quality Policy Division (C504-03), U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, telephone number: (919) 541-2380; fax number: (919) 541-

5509, e-mail address: svendsgaard.dave@epa.gov.

SUPPLEMENTARY INFORMATION:**I. General Information***A. Does this action apply to me?*

Entities potentially affected by this action include sources in various industry groups and State, local, and tribal governments.

B. How is this document organized?

This document is organized as follows:

I. General Information**II. Background****III. This Action****A. Overview****B. Analysis of Proposed and Alternative Interpretations for Subject to Regulation**

1. Actual Control Interpretation
2. Monitoring and Reporting Interpretation
3. State Implementation Plan (SIP) Interpretation
4. Endangerment Finding Interpretation
5. Section 209 Waiver Interpretation
- C. Other Issues on Which EPA Solicited Comment

1. Prospective Codification of Interpretation**2. Section 821 of the Clean Air Act Amendments of 1990****3. Timing of When a Pollutant becomes Subject to Regulation****IV. Application of PSD Interpretive Memo to Permitting for GHGs****A. Date by Which GHGs Will Be "Subject to Regulation"****B. Implementation Concerns****C. Interim EPA Policy To Mitigate Concerns Regarding GHG Emissions from Construction or Modification of Large Stationary Sources****D. Transition for Pending Permit Applications****V. PSD Program Implementation by EPA and States****VI. Application of the Title V Program to Sources of GHGs****VII. Statutory Authority****VIII. Judicial Review****II. Background**

On December 18, 2008, then-EPA Administrator Stephen Johnson issued a memorandum setting forth EPA's interpretation regarding which pollutants were "subject to regulation" for the purposes of the Federal PSD permitting program. *See* Memorandum from Stephen Johnson, EPA Administrator, to EPA Regional Administrators, RE: EPA's Interpretation of Regulations that Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program (Dec. 18, 2008) ("PSD Interpretive Memo" or "Memo"); *see also* 73 FR 80300 (Dec. 31, 2008) (public notice of Dec. 18, 2008 memo). The Memo interprets the phrase "subject to

regulation" to include pollutants "subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant," while excluding pollutants "for which EPA regulations only require monitoring or reporting." *See* Memo at 1. The Memo was necessary after issues were raised regarding the scope of pollutants that should be addressed in PSD permitting actions following the Supreme Court's April 2, 2007 decision in *Massachusetts v. EPA*, 549 U.S. 497 (2007).

In *Massachusetts v. EPA*, the Supreme Court held that GHGs, including carbon dioxide (CO₂), fit within the definition of air pollutant in the CAA. The case arose from EPA's denial of a petition for rulemaking filed by more than a dozen environmental, renewable energy, and other organizations requesting that EPA control emissions of GHGs from new motor vehicles under section 202(a) of the CAA. The Court found that, in accordance with CAA section 202(a), EPA was required to determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.¹

On November 13, 2008, the Environmental Appeals Board (EAB) issued a decision in a challenge to a PSD permit to construct a new electric generating unit in Bonanza, Utah. *In re Deseret Power Electric Cooperative*, PSD Appeal No. 07-03 (EAB Nov. 13, 2008) ("*Deseret*"). The permit was issued by EPA Region 8 in August 2007 and did not include best available control technology (BACT) limits for CO₂. At the time, the Region acknowledged *Massachusetts* but found that decision alone did not require PSD permits to include limits on CO₂ emissions. In briefs filed in the EAB case, EPA maintained the position that the Agency had a binding, historic interpretation of the phrase "subject to regulation" in the Federal PSD regulations that required PSD permit limits to apply only to those pollutants already subject to actual control of emissions under other provisions of the CAA. Response of EPA Office of Air and Radiation and Region 8 to Briefs of Petitioner and Supporting Amici (filed March 21, 2008). Accordingly, EPA argued that the regulations contained in 40 CFR part 75, which require monitoring of CO₂ at some sources, did not make CO₂ subject

¹ On December 15, 2009, EPA published the final endangerment and cause or contribute findings for GHGs under section 202(a) of the CAA. *See* 74 FR 66495.

to PSD regulation. The order and opinion issued by the EAB remanded the permit after finding that prior EPA actions were insufficient to establish a historic, binding interpretation that “subject to regulation” for PSD purposes included only those pollutants subject to regulations that require actual control of emissions. However, the EAB also rejected arguments that the CAA compelled only one interpretation of the phrase “subject to regulation” and found “no evidence of a Congressional intent to compel EPA to apply BACT to pollutants that are subject only to monitoring and reporting requirements.” Thus, the Board remanded the permit to the Region to “reconsider whether or not to impose a CO₂ BACT limit in light of the ‘subject to regulation’ definition under the CAA.” The Board encouraged EPA to consider “addressing the interpretation of the phrase ‘subject to regulation under this Act’ in the context of an action of nationwide scope, rather than through this specific permitting proceeding.” See *Deseret* at 63–64.

EPA issued the PSD Interpretive Memo shortly after the *Deseret* decision with the stated purpose to “establish[] an interpretation clarifying the scope of the EPA regulation that determines the pollutants subject to the Federal Prevention of Significant Deterioration (PSD) program under the Clean Air Act (CAA or Act)” by providing EPA’s “definitive interpretation” of the definition of the term “regulated NSR pollutants” found at 40 CFR 52.21(b)(50) and resolving “any ambiguity in subpart (iv) of that paragraph, which includes ‘any pollutant that otherwise is subject to regulation under the Act.’” See Memo at 1. As the Memo explains, the statute and regulation use similar language—the regulation defines a regulated NSR pollutant to include “[a]ny pollutant that otherwise is subject to regulation under the Act” and requires BACT for “each regulated NSR pollutant,” per 40 CFR 52.21(b)(50) and (j), while the Act requires BACT for “each pollutant subject to regulation under this [Act],” per CAA sections 165(a)(4) and 169. The EAB had determined that “the meaning of the term ‘subject to regulation under this Act’ as used in [CAA] sections 165 and 169 is not so clear and unequivocal as to preclude the Agency from exercising discretion in interpreting the statutory phrase” in implementing the PSD program. See *Deseret* at 63.

The PSD Interpretive Memo seeks to resolve the ambiguity in implementation of the PSD program by stating that “EPA will interpret this definition of ‘regulated NSR pollutant’ to exclude pollutants for which EPA regulations only require monitoring or

reporting but to include each pollutant subject to either a provision in the Clean Air Act or regulation adopted by EPA under the Clean Air Act that requires actual control of emissions of that pollutant.” The Memo states that “EPA has not previously issued a definitive interpretation of the definition of ‘regulated NSR pollutant’ in section 52.21(b)(50) or an interpretation of the phrase ‘subject to regulation under the Act’ that addressed whether monitoring and reporting requirements constitute ‘regulation’ within the meaning of this phrase.” The Memo, however, explains that the interpretation reflects the “considered judgment” of then-Administrator Johnson regarding the PSD regulatory requirements and is consistent with both historic Agency practice and prior statements by Agency officials. See Memo at 1–2.

The PSD Interpretive Memo is not a substantive rule promulgated under section 307(d) of the CAA, but rather an interpretation of the terms of a regulation at 40 CFR 52.21(b)(50).² An interpretive document is one that explains or clarifies, and is consistent with, existing statutes or regulation. See *National Family Planning and Reproductive Health Ass’n v. Sullivan*, 979 F.2d 227, 236–37 (D.C. Cir. 1992). The PSD Interpretive Memo explains and clarifies the meaning of the definition of “regulated NSR pollutant” in section 52.21(b)(50) of the existing NSR regulations, and does not alter the meaning of the definition in any way that is inconsistent with the terms of the regulation. As a result, EPA concluded that the PSD Interpretive Memo was an interpretive rule that could be issued without a notice and comment rulemaking process.

However, the PSD Interpretive Memo observed that the adoption of an interpretation of a rule without a notice and comment process does not preclude subsequent action by the Agency to solicit public input on the interpretation. Indeed, given the significant public interest in the issue addressed in the December 18, 2008 memorandum, EPA subsequently elected to seek public input on the memorandum and alternative readings of the regulations.

On December 31, 2008, EPA received a petition for reconsideration of the position taken in the PSD Interpretive

² The PSD Interpretive Memo also reflects EPA’s interpretation of sections 165(a)(4) and 169(3) of the CAA, which use language similar to the EPA regulations that are based on these provisions of the statute. The Memo discusses the Agency’s interpretation of the CAA and concludes that the Agency’s interpretation of its regulations is not precluded by the terms of the CAA.

Memo from Sierra Club and 14 other environmental, renewable energy, and citizen organizations. See Petition for Reconsideration, In the Matter of: EPA Final Action Published at 73 FR 80300 (Dec. 31, 2008), entitled “Clean Air Act Prevention of Significant Deterioration (PSD) Construction Permit Program; Interpretation of Regulations That Determine Pollutants Covered by the Federal PSD Permit Program.” Petitioners argued that the PSD Interpretive Memo “was impermissible as a matter of law, because it was issued in violation of the procedural requirements of the Administrative Procedures [sic] Act * * * and the Clean Air Act * * *, it directly conflicts with prior agency actions and interpretations, and it purports to establish an interpretation of the Act that conflicts with the plain language of the statute.” See Petition at 2. Accordingly, Petitioners requested that EPA reconsider and retract the PSD Interpretive Memo. Petitioners later amended their Petition for Reconsideration to include a request to stay the effect of the Memo pending the outcome of the reconsideration request. Amended Petition for Reconsideration (filed Jan. 6, 2009).³

On February 17, 2009, EPA granted the Petition for Reconsideration, on the basis of the authority conferred by section 553(e) of the Administrative Procedure Act (APA), and announced its intent to conduct a rulemaking to allow for public comment on the issues raised in the Memo and on any issues raised by the EAB’s *Deseret* opinion, to the extent they do not overlap with the issues raised in the Memo.⁴ Because the Memo was not a substantive rule promulgated under section 307(d) of the APA, the reconsideration action was not a reconsideration under the authority of section 307(d)(7)(B) of the CAA. See Letter from Lisa P. Jackson, EPA Administrator, to David Bookbinder, Chief Climate Counsel at Sierra Club (Feb. 17, 2009). EPA did not stay the effectiveness of the PSD Interpretive Memo pending reconsideration, but the Agency did reiterate that the Memo

³ On January 15, 2009, a number of environmental organizations that filed this Petition for Reconsideration also filed a petition challenging the PSD Interpretive Memo in U.S. Court of Appeals for the District of Columbia Circuit. *Sierra Club v. E.P.A.*, No. 09–1018 (D.C. Cir., filed Jan. 15, 2009). Thereafter, various parties moved to intervene in that action or filed similar petitions challenging the Memo. The consolidated D.C. Circuit cases have been held in abeyance pending this reconsideration process. *Id.*, Order (filed March 9, 2009).

⁴ Because the grant of reconsideration directed the Agency to conduct this reconsideration using a notice and comment process, the proposal did not address the procedural challenge presented in the Petition for Reconsideration.

“does not bind States issuing [PSD] permits under their own State Implementation Plans.” *Id.* at 1.

On October 7, 2009 (74 FR 51535), EPA proposed a reconsideration of the PSD Interpretive Memo that solicited comment on five possible interpretations of the regulatory phrase “subject to regulation”—the “actual control” interpretation (adopted by the Memo); the “monitoring and reporting” interpretation (advocated by Petitioners); the inclusion of regulatory requirements for specific pollutants in SIPs (discussed in both the Memo and the Petition for Reconsideration); an EPA finding of endangerment (discussed in the Memo); and the grant of a section 209 waiver interpretation (raised by commenters in another EPA action). EPA also addressed, and requested public comment on, other issues raised in the PSD Interpretive Memo and related actions that may influence this reconsideration.

Of the five interpretations described in the proposed reconsideration notice, EPA expressly favored the actual control interpretation, which has remained in effect since issuing the memorandum, notwithstanding the EPA’s grant of reconsideration. The proposal explained that the actual control interpretation best reflects EPA’s past policy and practice, is in keeping with the structure and language of the statute and regulations, and best allows for the necessary coordination of approaches to controlling emissions of newly identified pollutants. While the other interpretations may represent reasoned approaches for interpreting “subject to regulation,” no particular one is compelled by the statute, nor did the EAB determine that any one of them was so compelled. Because EPA had overarching concerns over the policy and practical application of each of the alternative interpretations, the Agency proposed to retain the actual control interpretation. Nevertheless, EPA requested comment on all five of the interpretations.

III. This Action

A. Overview

EPA has made a final decision to continue applying (with one limited refinement) the Agency’s existing interpretation of 40 CFR 52.21(b)(50) that is articulated in the PSD Interpretive Memo. For reasons explained below, and addressed in further detail in the document “Reconsideration of Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs: EPA’s Response to Public

Comments”, after reviewing the comments, EPA has concluded that the “actual control interpretation” is a permissible interpretation of the CAA and is the most appropriate interpretation to apply given the policy implications. However, EPA is refining its interpretation in one respect to establish that PSD permitting requirements apply to a newly regulated pollutant at the time a regulatory requirement to control emissions of that pollutant “takes effect” (rather than upon promulgation or the legal effective date of the regulation containing such a requirement). In addition, this notice addresses several outstanding questions regarding the applicability of the PSD and Title V permitting programs to GHGs upon the anticipated promulgation of EPA regulations establishing limitations on emissions of GHGs from vehicles under Title II of the CAA.⁵

EPA received 71 comments on the proposed reconsideration notice published on October 7, 2009 (74 FR 51535).⁶ Commenters represented a range of interests, including State regulatory agencies, corporations that may need to obtain PSD permits, trade associations representing various industrial sectors, and environmental and public interest groups. Commenters representing States and regulated entities generally expressed support for the actual control interpretation, while environmental and public interest groups generally favored the alternative interpretations. States and regulated entities also supported EPA’s proposed action to apply PSD requirements at the point in time when an actual control requirement becomes effective, with many entities specifically requesting that EPA interpret “effective” to mean the compliance date of a rule. Environmental stakeholders supported retaining the position in the existing PSD Interpretive Memo that PSD requirements apply to a pollutant upon the promulgation of the relevant requirement for that pollutant.

EPA has not been persuaded that the Agency is compelled by the CAA, the

terms of EPA regulations, or prior EPA action to apply any of the four alternatives to its preferred interpretation described in the October 7, 2009 notice—monitoring and reporting requirement, EPA-approved SIP, endangerment finding, or CAA section 209 waiver. EPA has likewise not been persuaded that all of the alternative interpretations are precluded by the CAA. However, since Congress has not precisely spoken to this issue, EPA has the discretion to choose among the range of permissible interpretations of the statutory language. Since EPA’s interpretation of the regulations is not precluded by the statutory language, EPA is electing to maintain that interpretation on policy grounds. EPA has concluded that the “actual control” interpretation is not only consistent with decades of past practice, but provides the most reasonable and workable approach to developing an appropriate regulatory scheme to address newly identified pollutants of concern. Thus, except as to the one element that EPA proposed to modify, EPA is reaffirming the PSD Interpretive Memo and its establishment of the actual control interpretation as EPA’s definitive interpretation of the phrase “subject to regulation” under the PSD provisions in the CAA and EPA regulations.

EPA has been persuaded by public comments on the proposed reconsideration to modify the portion of its interpretation regarding the timing of when a pollutant becomes subject to regulation under the CAA and thus covered by the requirements of the PSD permitting program. Specifically, EPA is modifying its interpretation of 40 CFR 52.21(b)(50) of its regulations, and the parallel provision in 40 CFR 51.166(b)(49), to establish that the PSD requirements will not apply to a newly regulated pollutant until a regulatory requirement to control emissions of that pollutant “takes effect.” EPA has concluded that this approach is consistent with the CAA and a reasonable reading of the regulatory text.

Based on these final determinations, EPA will continue to apply the interpretation reflected in the PSD Interpretive Memo with one refinement. For the reasons discussed in more detail below, EPA has not generally found cause to change the discussion or reasoning reflected in the Memo. As a result, EPA does not see a need to either withdraw or re-issue the Memo. However, this notice refines one paragraph of that memorandum to reflect EPA’s current view that a pollutant becomes subject to regulation

⁵ On September 28, 2009, EPA proposed a rule establishing emissions standards for new motor vehicles, starting with Model Year 2012, that would reduce GHGs and improve fuel economy from motor vehicles. This proposal was a joint proposal by EPA and the U.S. Department of Transportation (DOT), with DOT proposing to adopt corporate average fuel economy (CAFE) standards for model years 2012 and after. See 74 FR 49453.

⁶ In some cases, a commenter on the proposed reconsideration of the PSD Interpretive Memo addressed an issue or topic that is under consideration in the forthcoming PSD and Title V GHG Tailoring Rule. Accordingly, EPA refers the reader to that rulemaking for EPA responses to those comments.

at the time the first control requirements applicable to a pollutant take effect. Public comments raised several questions regarding the application of the PSD program and Title V permits to GHGs that EPA did not specifically raise in the October 7, 2009 proposed notice of reconsideration. Some of these comments raised significant issues that the Agency recognizes the need to address at this time to ensure the orderly transition to the regulation of GHGs under these permitting programs. Thus, this notice reflects additional interpretations and EPA statements of policy on topics not discussed in the October 7, 2009 notice. These interpretations and policies have been developed after careful consideration of the public comments submitted to EPA on this action and related matters. In subsequent actions, EPA may address additional topics raised in public comments on this action that the Agency did not consider necessary to address at this time.

Regarding GHGs, EPA has concluded that PSD program requirements will apply to GHGs upon the date that the anticipated tailpipe standards for light-duty vehicles (known as the "LDV Rule") take effect. Based on the proposed LDV Rule, those standards will take effect when the 2012 model year begins, which is no earlier than January 2, 2011. While the LDV Rule will become "effective" for the purposes of planning for the upcoming model years as of 60 days following publication of the rule, the emissions control requirements in the rule do not "take effect"—*i.e.*, requiring compliance through vehicular certification before introducing any Model Year 2012 into commerce—until Jan. 2, 2011, or approximately 9 months after the planned promulgation of the LDV Rule. Furthermore, as EPA intends to explain soon in detail in the final action on the PSD and Title V GHG Tailoring Rule (known as the "Tailoring Rule"),⁷ in light of the significant administrative challenges presented by the application of the PSD and Title V requirements for GHGs (and considering the legislative intent of the PSD and Title V statutory provisions), it is necessary to defer applying the PSD and Title V provisions for sources that are major based only on emissions of GHGs until a date that extends beyond January 2, 2011.

B. Analysis of Proposed and Alternative Interpretations for Subject to Regulation

1. Actual Control Interpretation

EPA has concluded that the "actual control" interpretation (as articulated in the PSD Interpretive Memo) is permissible under the CAA and is preferred on policy grounds. Thus, EPA will continue to interpret the definition of "regulated NSR pollutant" in 40 CFR 52.21(b)(50) to exclude pollutants for which EPA regulations only require monitoring or reporting but to include each pollutant subject to either a provision in the CAA or regulation promulgated by EPA under the CAA that requires actual control of emissions of that pollutant. As discussed further below, EPA will also interpret section 51.166(b)(49) of its regulations in this manner. This interpretation is supported by the language and structure of the regulations and is consistent with past practice in the PSD program and prior EPA statements regarding pollutants subject to the PSD program. The CAA is most effectively implemented by making PSD emissions limitations applicable to pollutants after a considered judgment by EPA (or Congress) that particular pollutants should be subject to control or limitation. The actual control interpretation promotes the orderly administration of the permitting program by allowing the Agency to first assess whether there is a justification for controlling emissions of a particular pollutant under relevant criteria in the Act before applying the requirements of the PSD permitting program to a pollutant.

Because the term "regulation" is susceptible to more than one meaning, there is ambiguity in the phrase "each pollutant subject to regulation under the Act"⁸ that is used in both sections 165(a)(4) and 169(3) of the CAA. As discussed in the Memo, the term "regulation" can be used to describe a rule contained in a legal code, such as the Code of Federal Regulations, or the act or process of controlling or restricting an activity. The primary meaning of the term "regulation" in Black's Law Dictionary (8th Ed.) is "the act or process of controlling by rule or restriction." However, an alternative meaning in this same dictionary defines

the term as "a rule or order, having legal force, usu. issued by an administrative agency or local government." The primary meaning in Webster's dictionary for the term "regulation" is "the act of regulating: The state of being regulated." Merriam-Webster's Collegiate Dictionary 983 (10th Ed. 2001). Webster's secondary meaning is "an authoritative rule dealing with details of procedure" or "a rule or order issued by an executive authority or regulatory agency of a government and having the force of law." Webster's also defines the term "regulate" and the inflected forms "regulated" and "regulating" (both of which are used in Webster's definition of "regulation") as meaning "to govern or direct according to rule" or "to bring under the control of law or constituted authority." *Id.*

The PSD Interpretive Memo reasonably applies a common meaning of the term "regulation" to support a permissible interpretation that the phrase "pollutant subject to regulation" means a pollutant subject to a provision in the CAA or a regulation issued by EPA under the Act that requires actual control of emissions of that pollutant. Public comments have not demonstrated the dictionary meanings of the term "regulation" described in the Memo are no longer accepted meanings of this term. In light of the different meanings of the term "regulation," EPA has not been persuaded by public comments that the CAA plainly and unambiguously requires that EPA apply any of the other interpretations described in the October 7, 2009 notice. Moreover, the Memo carefully explains how the actual control interpretation is consistent with the overall context of the CAA in which sections 165(a)(4) and 169(3) are found. After consideration of public comment, EPA continues to find this discussion persuasive. The "subject to regulation" language appears in the BACT provisions of the Act, which themselves require actual controls on emissions. The BACT provisions reference the New Source Performance Standards (NSPS) and other control requirements under the Act, which establish a floor for the BACT requirement. *See* 42 U.S.C. 7479(3). Other provisions in the CAA that authorize EPA to establish emissions limitations or controls on emissions provide criteria for the exercise of EPA's judgment to determine which pollutants or source categories to regulate. Thus, it follows that Congress expected that pollutants would only be regulated for purposes of the PSD program after: (1) The EPA promulgated regulations requiring control of a particular

⁷ The proposed "Tailoring Rule" can be found at 74 FR 55291 (Oct. 27, 2009).

⁸ The CAA requires BACT for "each pollutant subject to regulation under this Act." *See* CAA 165(a)(4), 169(3). The United States Code refers to "each pollutant regulated under this chapter," which is a reference to Chapter 85 of Title 42 of the Code, where the CAA is codified. *See* 42 U.S.C. 7475(a)(4), 7479(3). For simplicity, this notice generally uses "the Act" and the CAA section numbers rather than the U.S. Code citation.

pollutant on the basis of considered judgment, taking into account the applicable criteria in the CAA, or (2) EPA promulgates regulations on the basis of Congressional mandate that EPA establish controls on emissions of a particular pollutant, or (3) Congress itself directly imposes actual controls on emissions of a particular pollutant. In addition, considering other sections in the Act that require reasoned decision-making and authorize the collection of emissions data prior to establishing controls on emissions, it is also consistent with the Congressional design to require BACT limitations for pollutants after a period of data collection and study that leads to a reasoned decision to establish control requirements. Public commenters did not demonstrate that it was erroneous for EPA to interpret the PSD provisions in this manner, based on the context of the Act.

Furthermore, the actual control interpretation is consistent with the terms of the regulations EPA promulgated in 2002.⁹ EPA continues to find the reasoning of the PSD Interpretive Memo to be persuasive. The structure and language of EPA's definition of "regulated NSR pollutant" at 40 CFR 52.21(b)(50) supports the actual control interpretation. The first three parts of the definition describe pollutants that are subject to regulatory requirements that mandate control or limitation of the emissions of those pollutants, which suggests that the use of "otherwise subject to regulation" in the fourth prong of the definition also intended some prerequisite act or process of control. The definition's use of "subject to regulation" should be read in light of the primary meanings of "regulation" described above, which each use or incorporate the concept of control.

One commenter stated that EPA's suggestion that its proposed interpretation will allow for a more practical approach to determining whether emissions of air pollutants endanger health and human welfare amounts only to a policy preference. The commenter argued that EPA's policy preference should be subordinate to statutory language and Congressional intent. Another commenter made similar comments and stated that EPA cannot avail itself of additional, non-statutory *de facto* extensions of time to fulfill its statutory obligations.

Where the governing statutory authority is susceptible to more than one interpretation, it is not impermissible for EPA to apply policy

preferences when determining which interpretation to apply, so long as the interpretation EPA elects to follow is a permissible one. The PSD Interpretive Memo provides a persuasive explanation for why the interpretation reflected in that memorandum is consistent with the terms of the CAA and Congressional intent. In this instance, EPA's policy preferences are fully consistent with that intent. As explained above, Congress intended for EPA to gather data before establishing controls on emissions and to make reasoned decisions.

EPA continues to prefer the actual control interpretation because it ensures an orderly and manageable process for incorporating new pollutants into the PSD program after an opportunity for public participation in the decision making process. Several commenters who supported EPA's proposal to continue applying the "actual control" interpretation identified these considerations as important reasons that EPA should continue doing so. EPA agrees with these comments. As discussed persuasively in the PSD Interpretive Memo, under this interpretation, EPA may first assess whether there is a justification for controlling emissions of a particular pollutant under relevant criteria in the Act before imposing controls on a pollutant under the PSD program. In addition, this interpretation permits the Agency to provide notice to the public and an opportunity to comment when a new pollutant is proposed to be regulated under one or more programs in the Act. It also promotes the orderly administration of the permitting program by providing an opportunity for EPA to develop regulations to manage the incorporation of a new pollutant into the PSD program, for example, by promulgating a significant emissions rate (or *de minimis* level) for the pollutant when it becomes regulated. See 40 CFR 52.21(b)(23). Furthermore, this interpretation preserves the Agency's ability to gather data on pollutant emissions to inform their judgment regarding the need to establish controls on emissions without automatically triggering such controls. This interpretation preserves EPA's authority to require control of particular pollutants through emissions limitations or other restrictions under various provisions of the Act, which would then trigger the requirements of the PSD program for any pollutant addressed in such an action.

Some commenters who opposed the actual control interpretation argued that this deliberate approach leads to "analysis paralysis" and is subject to

political manipulation. The commenter further noted that the case-by-case BACT requirement does not contemplate waiting years for EPA to conduct analyses and "develop" control options; rather, BACT must be based on control options that are available. Then, permitting agencies are to make "case-by-case" determinations "taking into account energy, environmental, and economic impacts and other costs," thereby ensuring that the decision is informed by the available solutions, their efficacy and costs.

While this analysis may sometimes take more time than the commenter would prefer, a deliberative and orderly approach to regulation is in the public interest and consistent with Congressional intent. It would be premature to impose the BACT requirement on a particular pollutant if neither EPA nor Congress has made a considered judgment that a particular pollutant is harmful to public health and welfare and merits control.

Once the Agency has made a determination that a pollutant should be controlled using one or more of the regulatory tools provided in the CAA and those controls take effect, EPA agrees that a BACT analysis must then be completed based on available information. As the commenter points out, the BACT process is designed to determine the most effective control strategies achievable in each instance, considering energy, environmental, and economic impacts. Thus, EPA agrees that the onset of the BACT requirement should not be delayed in order for technology or control strategies to be developed. Furthermore, EPA agrees with the commenter that delaying the application of BACT to enable development of guidance on control strategies is not necessarily consistent with the BACT requirement. The BACT provisions clearly contemplate that the permitting authority will develop control strategies on a case-by-case basis. Thus, EPA is not in this final action relying on the need to develop guidance for BACT as a justification for choosing to continue applying the actual control interpretation. However, in the absence of guidance on control strategies from EPA and other regulatory agencies, the BACT process may be more time and resource intensive when applied to a new pollutant. Under a mature PSD permitting program, successive BACT analyses establish guidelines and precedents for subsequent BACT determinations. However, when a new pollutant is regulated, the first permit applicants and permitting authorities that are faced with determining BACT for a new

⁹ See 67 FR 80186–80289.

pollutant must invest more time and resources in making an assessment of BACT under the statutory criteria. Given the potentially large number of sources that could be subject to the BACT requirement when EPA regulates GHGs, the absence of guidance on BACT determinations for GHGs presents a unique challenge for permit applicants and permitting authorities. EPA intends to address this challenge in part by deferring, under the Tailoring Rule, the applicability of the PSD permitting program for sources that would become major based solely on GHG emissions. EPA is also developing guidance on BACT for GHGs.

Several commenters expressed concern with EPA's explanation that the actual control interpretation best reflects EPA's past practice. One commenter argued that the *Deseret* decision rejects the idea that "past policy and practice" is a sufficient justification for EPA's preferred interpretation. In addition, several commenters argued that the memorandum was in fact not consistent with past EPA practice, based on their interpretation of a statement made in the preamble to a rule which promulgated PSD regulations in 1978.

While the record continues to show that the actual control interpretation is consistent with EPA's historic practice, EPA agrees that continuity with past practice alone does not justify maintaining a position when there is good cause to change it. In this case, however, EPA has not found cause to change an interpretation that is consistent with Congressional intent and supported by the policy considerations described earlier. Thus, EPA is not retaining the actual control interpretation simply to maintain continuity with historic practice. The record reflects that EPA's past practice was grounded in a permissible interpretation of the law and supported by rational policy considerations. Commenters have not otherwise persuaded EPA to change its historic practice in this area.

A review of numerous Federal PSD permits shows that EPA has been applying the actual control interpretation in practice—issuing permits that only contained emissions limitations for pollutants subject to regulations requiring actual control of emissions under other portions of the Act. Furthermore, in 1998, well after promulgation of the initial CO₂ monitoring regulations in 1993, EPA's General Counsel concluded that CO₂ would qualify as an "air pollutant" that EPA had the authority to regulate under the CAA, but the General Counsel also observed that "the Administrator has

made no determination to date to exercise that authority under the specific criteria provided under any provision of the Act."¹⁰ The 1978 **Federal Register** notice promulgating the initial PSD regulations stated that pollutants "subject to regulation" in the PSD program included "any pollutant regulated in Subchapter C of Title 40 of the Code of Federal Regulations." Commenters argue this statement illustrates that EPA has in fact applied the PSD BACT requirement to any pollutant subject to only a monitoring requirement codified in this portion of the Code of Federal Regulations. However, this comment overlooked the discussion in the PSD Interpretive Memo regarding the differing meanings of the term "regulation" and "regulate." The 1978 preamble did not amplify the meaning of the term "regulated in." Thus, commenters have not demonstrated that EPA had concluded in 1978 that monitoring requirements equaled "regulation" within the meaning of sections 165(a)(4) and 169(3) of the CAA, nor have commenters provided any examples of permits issued by EPA after 1978 that demonstrate EPA's interpretation was inconsistent with the practice described in the PSD Interpretive Memo.

Therefore, EPA affirms that the actual control interpretation expressed in the PSD Interpretive Memo continues to be the operative statement for the EPA interpretation of the meaning of the regulatory phrase "subject to regulation" within the Federal PSD rules.

2. Monitoring and Reporting Interpretation

EPA is not persuaded that the monitoring and reporting interpretation is compelled by the CAA, and the Agency remains concerned that application of this approach would lead to odd results and make the PSD program difficult to administer. EPA continues to find the reasoning of the PSD Interpretive Memo persuasive.

The monitoring and reporting interpretation would make the substantive requirements of the PSD program applicable to particular pollutants based solely on monitoring and reporting requirements (contained in regulations established under section 114 or other authority in the Act). This approach would lead to the perverse result of requiring emissions limitations under the PSD program while the Agency is still gathering the information

necessary to conduct research or evaluate whether to establish controls on the pollutant under other parts of the Act. Such a result would frustrate the Agency's ability to gather information using section 114 and other authority and make informed and reasoned judgments about the need to establish controls or limitations for particular pollutants. If EPA interpreted the requirement to establish emissions limitations based on BACT to apply solely on the basis of a regulation that requires collecting and reporting emissions data, the mere act of gathering information would essentially dictate the result of the decision that the information is being gathered to inform (whether or not to require control of a pollutant). Many commenters representing State permitting agencies and industry groups agree with the policy arguments advanced by EPA and others that EPA's critical information gathering activities will be constrained, with likely adverse environmental and public health consequences, if monitoring requirements are necessarily associated with the potentially significant implementation and compliance costs and resource constraints of the PSD program. Commenters expressed concern that without the ability to gather data or investigate unregulated pollutants, for fear of triggering automatic regulation under the CAA, EPA will not have the flexibility to review the validity of controlling new pollutants.

EPA agrees that a monitoring and reporting interpretation would hamper the Agency's ability to conduct monitoring or reporting for investigative purposes to inform future rulemakings involving actual emissions control or limits. In addition, it is not always possible to predict when a new pollutant will emerge as a candidate for regulation. In such cases, the Memo's reasoning is correct in that EPA would be unable to promulgate any monitoring or reporting rule for such a pollutant without triggering PSD under this interpretation.

An environmental organization disagreed with the proposed notice of reconsideration, and commented that EPA has issued monitoring and reporting regulations for CO₂ in 40 CFR part 75, promulgated pursuant to section 821 of the 1990 CAA Amendments. The commenter felt that these monitoring and reporting rules are "regulation" in that they are contained in a legal code, have the force of law, and bring the subject matter under the control of law and the EPA. Furthermore, the commenter says that EPA itself has characterized these

¹⁰ Memorandum from Jonathan Z. Cannon, General Counsel to Carol M. Browner, Administrator, entitled *EPA's Authority to Regulate Pollutants Emitted by Electric Power Generation Sources* (April 10, 1998).

monitoring and reporting requirements as “regulations.” In contrast, another commenter argued that an agency’s interpretation of a statute should focus first on the ordinary dictionary meaning of the terms used and that monitoring emissions does not fit within any of the types of activities understood to constitute “regulation” of those emissions in the ordinary meaning of that term. Each of these commenters focuses on only one of the two potential meanings of the term “regulation” described above.

The commenter that favors the “monitoring and reporting” interpretation appears to focus only on the dictionary meanings that describe a rule contained in a legal code. The commenter has not demonstrated that it is impermissible for EPA to construe the CAA on the basis of another common meaning of the term “regulation.” In the context of construing the Act, the EAB observed in the *Deseret* case that a plain meaning could not be ascertained from looking solely at the word “regulation.” The Board reached this conclusion after considering the dictionary definitions of the term “regulation” cited above. *See Deseret* slip op. at 28–29. EPA continues to find the reasoning of the EAB and the PSD Interpretive Memo to be persuasive. The EAB found “no evidence of Congressional intent to compel EPA to apply BACT to pollutants that are subject only monitoring and reporting requirements.” *See Deseret* at 63.

Comments have not convincingly shown that Congress clearly intended to use the term “regulation” in section 165(a)(4) and 169(3) to describe any type of rule in a legal code. Some commenters presented alternative theories of Congressional intent regarding the BACT provisions, but they have not persuasively demonstrated that the interpretation of Congressional intent based on the context of the CAA described in the PSD Interpretive Memo is erroneous.

For example, one commenter opposed to EPA’s proposed action commented that the PSD Interpretive Memo ignores the Congressionally-established purpose of PSD to protect public health and welfare from actual and potential adverse effects. *See CAA* section 160(1). Specifically, this commenter stated that to limit application of BACT until after control requirements are in place following an endangerment finding ignores the broad, protective purpose of the PSD program. The commenter said that the emphasis on “potential adverse effect[s]” distinguishes PSD the requirement from the National Ambient Air Quality Standards (NAAQS) and

NSPS programs, which require that EPA make an endangerment finding before establishing generally applicable standards such as the NSPS or motor vehicle emissions standards. According to this commenter, BACT’s case-by-case approach provides the dynamic flexibility necessary to implement an emission limitation appropriate to each particular source. This commenter feels that the PSD program’s ability to address potential adverse effects is hindered by the position that an endangerment determination and actual control limits must be first established.

EPA does not agree that the terms of section 160 cited by the commenter compel EPA to read sections 165(a)(4) and 169(3) to apply to a pollutant before the Agency has established control requirements for the pollutant. Section 160(1) describes PSD’s purpose to “protect public health and welfare from any actual or potential adverse effect which in the Administrator’s judgment may reasonably be anticipated to occur from air pollution.” Thus, this goal contemplates an exercise of judgment by EPA to determine that an actual or potential adverse effect may reasonably be anticipated from air pollution. In that sense, this goal is consistent with NAAQS and NSPS programs, which contemplate that regulation of a pollutant will not occur until a considered judgment by EPA that a substance or source category merits control or restriction. The commenter has not persuasively established that the “potential adverse effect” language in section 160(1) makes this provision markedly different than the language used in sections 108(a)(1)(A) and 111(b)(1)(A). All three sections use the phrase “may reasonably be anticipated.” Furthermore, section 160 contains general goals and purposes and does not contain explicit regulatory requirements. The controlling language in the PSD provisions is the “subject to regulation” language in sections 165(a)(4) and 169(3). As discussed earlier, the “actual control” interpretation is based on a common and accepted meaning of the term “regulation.” To the extent the goals and purpose in section 160 are instructive as to the meaning of other provisions in Part C of the Act, section 160(1) is just one of several purposes of the PSD program that Congress specified. The Act also instructs EPA to ensure that economic growth occurs consistent with the preservation of existing clean air resources. *See CAA* section 160(3). EPA’s interpretation is consistent with this goal because it allows EPA to look at the larger picture by coordinating

control of an air pollutant under the PSD program with control under other CAA provisions.

EPA finds the logic of the PSD Interpretive Memo more persuasive. The Memo considers the full context of the CAA, including the health and welfare criteria that generally must be satisfied to establish control requirements under other parts of the Act, information gathering provisions that contemplate data collection and study before pollutants are controlled, and requirements for reasoned decision making. While some commenters presented arguments for why it might be possible or beneficial to apply the BACT requirement before a control requirement is established for a pollutant elsewhere under the Act, these arguments do not demonstrate that the contextual reading of the CAA described in the Memo is erroneous. Thus, the comments have at most provided another permissible reading of the Act, but they do not demonstrate that EPA must require BACT limitations for pollutants that are not yet controlled but only subject to data collection and study.

EPA continues to believe that the monitoring and reporting interpretation is inconsistent with past agency practice because, as the Memo notes, “EPA has not issued PSD permits containing emissions limitations for pollutants that are only subject to monitoring and reporting requirements,” including CO₂ emissions. Further, the Memo determines that the monitoring and reporting interpretation is not required under the 1978 preamble language, explaining that the preamble language could be interpreted in a variety of ways and “did not specifically address the issue of whether a monitoring or reporting requirement makes a pollutant ‘regulated in’ [Subpart C of Title 40] of the Code of Federal Regulations.” *See Memo* at 11–12. Commenters have not demonstrated that the Agency specifically intended, through this statement, to apply the PSD requirements to pollutants that were covered by only a monitoring and reporting requirement codified in this part of the CFR.

One commenter questioned EPA’s basis for rejecting the monitoring and reporting interpretation because they believe EPA has not identified a pollutant other than CO₂ that would be affected by the monitoring and reporting interpretation. However, EPA’s GHG Reporting Rule covers six GHGs, not just CO₂. Further, EPA has promulgated regulations that require monitoring of oxygen (O₂) in the stack of a boiler under certain circumstances. *See 40*

CFR 60.49Da(d). These examples help demonstrate why monitoring and reporting requirements alone should not be interpreted to trigger PSD and BACT requirements.

For the reasons discussed above, EPA affirms the Memo's rejection of the monitoring and reporting interpretation for triggering PSD requirements for a new pollutant.

3. State Implementation Plan (SIP) Interpretation

In discussing the application of the actual control interpretation to specific actions under the CAA, the PSD Interpretive Memo rejects an interpretation of "subject to regulation" in which regulatory requirements for a particular pollutant in the EPA-Approved State Implementation Plan (SIP) for a single State would "require regulation of that pollutant under the PSD program nationally." (Hereinafter, referred to as the "SIP interpretation.") In this action, EPA affirms and supplements the rationale for rejecting the SIP interpretation provided in the PSD Interpretive Memo and the reconsideration proposal. Since the meaning of the term "subject to regulation" is ambiguous and susceptible to multiple interpretations, the SIP interpretation is not compelled by the structure and language of the Act. Furthermore, there would be negative policy implications if EPA adopted this interpretation.

The Memo reasons that application of the SIP interpretation would convert EPA's approval of regulations applicable only in one State into a decision to regulate a pollutant on a nationwide scale for purposes of the PSD program. The Memo explains that the establishment of SIPs is better read in light of the "cooperative federalism" underlying the Act, whereby Congress allowed individual States to create and apply some regulations more stringently than Federal regulations within its borders, without allowing individual States to set national regulations that would impose those requirements on all States. *See Ellis v. Gallatin Steel Co.*, 390 F.3d 461, 467 (6th Cir. 2004). In rejecting the SIP interpretation, the Memo also explains that EPA adopted a similar position in promulgating the NSR regulations for fine particulate matter (or "PM_{2.5}"), without any public comments opposing that position. *See* Memo at 15-16.

EPA continues to believe that the CAA and EPA's implementing regulations are intended to provide States flexibility to develop and implement SIPs to meet the air quality goals of their individual State. Each

State's implementation plan is a reflection of the air quality concerns in that State, allowing a State significant latitude in the treatment of specific pollutants of concern (or their precursors) within its borders based on air quality, economic, and other environmental concerns of that State. As such, pollutant emissions in one State may not present the same problem for a State a thousand miles away. As expressed in the PSD Interpretive Memo, EPA continues to have concerns that the SIP interpretation would improperly limit the flexibility of States to develop and implement their own air quality plans, because the act of one State to establish regulatory requirements for a particular pollutant would drive national policy. If EPA determined that a new pollutant becomes "subject to regulation" nationally within the meaning of section 165 based solely on the provisions of an EPA-approved SIP, then all States would be required to subject the new pollutant to PSD permitting whether or not control of the air pollutant was relevant for improving that State's air quality. Whether one State, five States, or 45 States make the decision that their air quality concerns are best addressed by imposing regulations on a new pollutant, EPA does not think those actions should trump the cooperative federalism inherent in the CAA. While several States may face similar air quality issues and may choose regulation as the preferred approach to dealing with a particular pollutant, EPA is concerned that allowing the regulatory choices of some number of States to impose PSD regulation on all other States would do just that.

Some commenters support the SIP interpretation, and fault the Agency's rejection of the interpretation by stating that neither the Act, nor the Memo, provides a basis for a position that regulation by a single State is not enough to constitute "regulation under the Act" on a nationwide basis for purpose of section 165. Petitioners and another commenter also assert that CO₂ is already "subject to regulation under the Act" and take the position that any requirement EPA adopts and approves in an implementation plan makes the covered pollutant "subject to regulation under the Act" because it is approved by the EPA "under the Act," and because it becomes enforceable by the State, by EPA and by citizens "under the Act" upon approval.

EPA disagrees with the Petitioner and with this commenter that this reasoning necessarily means that a pollutant regulated in one SIP approved by EPA must automatically be regulated through

the PSD program nationally. In fact, Congress demonstrated intent, in the language and structure of the Act, for SIP requirements to have only a local or regional effect.

In section 102(a) of the CAA, Congress directs EPA to encourage cooperative activities among States, and the adoption of uniform State and local laws for the control of air pollution "as practicable in light of the varying conditions and needs." This language informs the issue of whether SIP requirements have nationwide applicability in two ways. First, there would be no need for EPA to facilitate uniform adoption of standards in different air quality control regions, if the regulation of an air pollutant by one region would automatically cause that pollutant to be regulated in another region. Second, Congress bounded its desire to promote uniformity by recognizing that addressing local air quality concerns may preempt national uniformity of regulation.

Indeed, section 116 of the CAA grants States the right to adopt more stringent standards than the uniform, minimum requirements set forth by EPA. *See* 42 U.S.C. 7416. The legislative history of the 1977 CAA Amendments shows that Congress understood that States may adopt different and more stringent standards than the Federal minimum requirements. *See, e.g.*, 122 Cong. Rec. S12456 (daily ed. July 26, 1976) (statement of Sen. Randolph) ("[T]he States are given latitude in devising their own approaches to air pollution control within the framework of broad goals. * * * The State of West Virginia has established more stringent requirements than those which, through the Environmental Protection Agency, are considered as adequate * * *"); 122 Cong. Rec. S12458 (daily ed. July 26, 1976) (statement of Sen. Scott) ("The States have the right, however, to require higher standards, and they should have under the police powers.") Congress could not have intended States to have latitude to implement their own approaches to air pollution control, and simultaneously, require that air pollutants regulated by one State automatically apply in all other States.

Importantly, the legislative history also shows that Congress intended to limit the EPA's ability to disapprove a State's decision to adopt more stringent requirements in setting forth the criteria for approving State submissions under section 110. This intent is supported by the following passage:

State implementation plans usually contain a unified set of requirements and frequently do not make distinctions between the controls needed to achieve one kind of

ambient standard or another. To try to separate such emission limitations and make judgments as to which are necessary to achieving the national ambient air quality standards assumes a greater technical capability in relating emissions to ambient air quality than actually exists.

A federal effort to inject a judgment of this kind would be an unreasonable intrusion into protected State authority. EPA's role is to determine whether or not a State's limitations are adequate and that State implementation plans are consistent with the statute. Even if a State adopts limits which may be stricter than EPA would require, EPA cannot second guess the State judgment and must enforce the approved State emission limit.¹¹

123 Cong. Rec. S9167 (daily ed. June 8, 1977) (statement of Sen. Muskie).

This Congressional intent is reflected within the statutory language. Under section 110(k)(3), the EPA Administrator "shall approve" a State's submittal if it meets the requirements of the Act, and under section 110(l) "shall not" approve a plan revision "if the revision would interfere with any other applicable requirement of this Act." Courts have similarly interpreted this language to limit EPA's discretion to approve or disapprove SIP requirements. *See, e.g., State of Connecticut v. EPA*, 656 F.2d 902, 906 (2d. Cir. 1981) ("As is illustrated by Congress's use of the word 'shall,' approval of an SIP revision by the EPA Administrator is mandatory if the revision has been the subject of a proper hearing and the plan as a whole continues to adhere to the requirements of section 110(a)(2)") (referencing *Union Electric Co. v. EPA*, 427 U.S. 246, 257 (1976); and *Mission Indus., Inc. v. EPA*, 547 F.2d 123 (1st Cir. 1976)). These provisions of the statute do not establish any authority or criteria for EPA to judge the approvability of a State's submission based on the implications such approval would have nationally. The absence of such authority or criteria in the applicable standard argues against nationwide applicability of SIP requirements and the SIP interpretation.

Moreover, under section 307(b) of the CAA, Congress assigns review of specific regulations promulgated by EPA and "any other nationally applicable regulations promulgated or final action taken, by the Administrator under this Act" only to the U.S. Court of Appeals for the District of Columbia Circuit ("D.C. Circuit"). In contrast, "the Administrator's action in approving and promulgating any implementation plan under Section 110 * * * or any other final action of the Administrator under

this Act * * * which is local or regionally applicable may be filed only in the United States Court of Appeals for the appropriate circuit." 42 U.S.C. 7607(b) (*emphasis added*). Thus, Congress set forth its intended applicability of these regulations in assigning judicial venue and clearly articulated that requirements in a SIP are generally "local or regionally applicable."

Even if the Act could be read to support EPA review of the national implications of State SIP submissions, such an approach would be undesirable for policy reasons. As highlighted in the reconsideration proposal, one practical effect of allowing State-specific concerns to create national regulation is that EPA's review of SIPs would likely be much more time-consuming, because EPA would have to consider each nuance of the SIP as a potential statement of national policy. Thus, EPA would have heightened oversight of air quality actions in all States—even those regarding local and State issues that are best decided by local agencies. EPA approval of SIPs would be delayed, which would in turn, delay State's progress toward improving air quality. And, EPA would be required to defend challenges to the approval of a SIP with national implications in the D.C. Circuit Court of Appeals rather than the local Circuit Court of Appeals. The potential increased burden of reviewing and approving SIPs to analyze the national implications of each SIP, and the associated delay in improving air quality, creates a compelling policy argument against adoption of the SIP interpretation.

Petitioners also fault EPA's reliance on *Connecticut v. EPA*, 656 F.2d 902 (2d Cir. 1981) and assert that this case has nothing to do with the issue of whether a pollutant is "subject to regulation under the Act." In the PSD Interpretive Memo, EPA cited *Connecticut* to support the notion that while a State is free to adopt air quality standards more stringent than required by the NAAQS or other Federal law provisions, Congress precludes those stricter requirements from applying to other States. The Agency agrees with commenter that the circumstances involved in that case are not directly analogous, but, nevertheless, the case supports the inference that EPA has drawn from it. The Court concluded that "[n]othing in the Act, however, indicates that a State must respect its neighbor's air quality standards (or design its SIP to avoid interference therewith) if those standards are more stringent than the requirements of Federal law." If a State is not required to respect the more

stringent requirements of a neighboring State in developing its own implementation plan, then by inference, the State would also not be compelled to follow the more stringent standards.

In sum, after reconsidering the legal and policy issues, EPA declines to adopt the SIP interpretation.

4. Endangerment Finding Interpretation

The PSD Interpretive Memo states that the fourth part of the regulated NSR pollutant definition ("[a]ny pollutant that otherwise is subject to regulation") should not be interpreted "to apply at the time of an endangerment finding." *See* Memo at 14 (hereinafter, referred to as the "endangerment finding interpretation."). After considering public comments, EPA is affirming the position expressed in the PSD Interpretive Memo that an endangerment finding alone does not make the requirements of the PSD program applicable to a pollutant. EPA maintains its view that the terms of EPA's regulations and the relevant provisions of the CAA do not compel EPA to conclude that an air pollutant becomes "subject to regulation" when EPA finds that it endangers public health or welfare without contemporaneously promulgating control requirements for that pollutant.

As explained in EPA's Endangerment and Cause or Contribute Findings for GHGs under section 202(a) of the CAA, there are actually two separate findings involved in what is often referred to as an endangerment finding. 74 FR 66496 (Dec. 15, 2009). The first finding addresses whether air pollution may reasonably be anticipated to endanger public health or welfare. The second finding involves an assessment of whether emissions of an air pollutant from the relevant source category cause or contribute to this air pollution. In this notice, EPA uses the phrase "endangerment finding" to refer to EPA findings on both of these questions. The EPA interpretation described here applies to both findings regardless of whether they occur together or separately.

As explained in the proposed reconsideration, an interpretation of "subject to regulation" that does not include endangerment findings is consistent with the first three parts of the definition of "regulated NSR pollutant" in section 52.21(b)(50) of EPA's regulations. Unlike the first three parts of the definition, an endangerment finding does not itself contain any restrictions (*e.g.*, regarding the level of air pollution or emissions or use). Moreover, two parts of the definition involve actions that can occur only after

¹¹ Notably, the legislative record refers to "State" emission limit, and makes no note of this State emission limitation having broader applicability.

an endangerment finding of some sort has taken place. In other words, other parts of the definition already bypass an endangerment finding and apply the PSD trigger to a later step in the regulatory process.

Specifically, under the first part of that definition, PSD regulation is triggered by promulgation of a NAAQS under CAA section 109. However, in order to promulgate NAAQS standards under section 109, EPA must first list, and issue air quality criteria for a pollutant under section 108, which in turn can only happen after EPA makes an endangerment finding and a version of a cause or contribute finding, in addition to meeting other requirements. See CAA sections 108(a)(1) and 109(a)(2). Thus, if EPA were to conclude that an endangerment finding, cause or contribute finding, or both would make a pollutant “subject to regulation” within the meaning of the PSD provisions, this would read all meaning out of the first part of the “regulated NSR pollutant” definition because a pollutant would become subject to PSD permitting requirements well before the promulgation of the NAAQS under section 109. See 40 CFR 52.21(b)(50)(i).

Similarly, the second part of the definition of “regulated NSR pollutant” includes any pollutant that is subject to a standard promulgated under section 111 of the CAA. Section 111 requires the EPA Administrator to list a source category, if in his or her judgment, “it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.” See CAA section 111(b)(1)(A). After EPA lists a source category, it promulgates NSPS for that source category. For a source category not already listed, if EPA were to list it on the basis of its emissions of a pollutant that was not previously regulated, and such a listing made that pollutant “subject to regulation” within the meaning of the PSD provisions, this chain of events would result in triggering PSD permitting requirements for that pollutant well in advance of the point contemplated by the second prong of the regulated NSR pollutant definition. See 40 CFR 52.21(b)(50)(ii).

Furthermore, as discussed in the Memo, waiting to apply PSD requirements at least until the actual promulgation of control requirements that follow an endangerment finding is sensible. The Memo explains that when promulgating the final regulations establishing the control requirements for a pollutant, EPA often makes decisions that are also relevant to decisions that must be made in implementing the PSD program for that pollutant. See Memo at

14. For example, EPA often does not make a final decision regarding how to identify the specific pollutant subject to an NSPS standard until the NSPS is issued, which occurs after both the endangerment finding and the source category listing.

Public comments echoed these concerns. One commenter said that subjecting the pollutant to PSD requirements, including imposition of BACT emission limits, before the Agency has taken regulatory action to establish emission controls would turn the CAA process on its head. Another commenter indicated that triggering PSD review upon completion of an endangerment finding, but potentially before the specific control requirement that flows directly from the endangerment finding, clearly undermines the orderly process created by Congress for regulation of new air pollutants. A third commenter added that establishing controls without having a standard to be achieved leads to uncertainty in the permitting program.

In further support of EPA’s interpretation that an endangerment finding does not make an air pollutant “subject to regulation” is the fact that an endangerment finding is not a codified regulation; it does not contain any regulatory text. The PSD Interpretive Memo explains, and numerous commenters agree, that an endangerment finding should not be construed as “regulating” the air pollutant(s) at issue because there is no actual regulatory language applicable to the air pollutant at this time in the Code of Federal Regulations. Rather, the finding is a prerequisite to issuing regulatory language that imposes control requirements. This is true even if the endangerment finding is a “rule” for purposes of administrative processes; that does not alter the fact that there is no regulation or regulatory text attached to the endangerment finding itself. Since an endangerment finding does not establish “regulation” within the common meaning of the term applied by EPA, EPA does not believe the CAA compels EPA to apply PSD requirements to a pollutant on the basis of an endangerment finding alone.

EPA’s interpretation is also consistent with the Supreme Court’s decision in *Massachusetts*. In its decision, the Court acknowledged that EPA “has significant latitude as to the manner, timing, content and coordination” of the regulations that would result from a positive endangerment finding under section 202(a). See 549 U.S. at 532. Just as EPA has discretion regarding the timing of the section 202(a) control

regulations that would flow from an endangerment finding under that section, it also has some discretion regarding the timing of the triggering of PSD controls that the statute requires based on those section 202(a) regulations. EPA has reasonably determined that PSD controls should not precede any other control requirements. Some commenters cited *Massachusetts* in support of EPA’s position.

For the foregoing reasons, EPA affirms that the prerequisite act of making an endangerment finding, a cause or contribute finding, or both, does not make a pollutant “subject to regulation” for the purposes of the PSD program. This interpretation applies to both steps of the endangerment finding—the finding that air pollution may reasonably be anticipated to endanger public health or welfare, and the finding that emissions of an air pollutant from a particular source category causes or contributes to this air pollution—regardless of whether the two findings occur together or separately. As explained above, EPA believes that there are strong legal and policy reasons for rejecting the endangerment finding interpretation.

5. Section 209 Waiver Interpretation

EPA is affirming its position that an Agency decision to grant a waiver to a State under section 209 of the CAA does not make the PSD program applicable to pollutants that may be regulated under State authority following a grant of such a waiver. For the reasons discussed below, the granting of a waiver does not make the pollutants that are regulated by a State after obtaining a section 209 waiver into pollutants regulated under the CAA. Furthermore, EPA is also affirming the position that PSD requirements are not applicable to a pollutant in all States when a handful of States besides the one obtaining the waiver adopt identical standards under section 177 of the CAA that are then approved into State SIPs by EPA.

As explained in the proposal, neither the PSD Interpretive Memo nor the Petition for Reconsideration raise the issue of whether a decision to grant a waiver under the section 209 of the CAA triggers PSD requirements for a pollutant regulated by a State after obtaining a waiver. EPA received comments in response to the notice of an application by California for a CAA section 209 waiver to the State of California to adopt and enforce GHG emission standards for new motor vehicles that suggested that arguments might be made that the grant of the waiver made GHGs subject to regulation

across the country for the purposes of PSD. *See* 74 FR 32744, 32783 (July 8, 2009). Those commenters requested that EPA state clearly that granting the California Waiver did not render GHGs subject to regulation under the CAA, while others commented that the question of when and how GHGs should be addressed in the PSD program or otherwise regulated under the Act should instead be addressed in separate proceedings. At that time, EPA stated that these interpretation issues were not a part of the waiver decision and would be more appropriately addressed in another forum.

In the proposed reconsideration notice, EPA proposed to affirm the following position that EPA previously explained to Congress: “a decision to grant a waiver under section 209 of the Act removes the preemption of State law otherwise imposed by the Act. Such a decision is fundamentally different from the decisions to establish requirements under the CAA that the Agency and the [EAB] have considered in interpreting the provisions governing the applicability of the PSD program.” Letter from Lisa P. Jackson, EPA Administrator, to Senator James M. Inhofe (March 17, 2009). Specifically, EPA proposed to find that neither the CAA nor the Agency’s PSD regulations make the PSD program applicable to pollutants that may be regulated by States after EPA has granted a waiver of preemption under section 209 of the CAA. Accordingly, EPA said that the Agency’s decision to grant a section 209 waiver to the State of California to establish its own GHG emission standards for new motor vehicles does not trigger PSD requirements for GHGs.

Several commenters disagreed with EPA’s proposed position on the section 209 waiver provisions, and assert that EPA’s granting of the waiver results in “actual control.” According to these commenters, even under EPA’s interpretation of “subject to regulation,” CO₂ is now subject to BACT. One of these commenters argues that EPA’s granting of a waiver is an EPA regulatory action that “controls” CO₂ by allowing California and 10 other States to “regulate” CO₂ under the Act. Another one of these commenters states that 10 States used section 177 of the CAA to adopt the California Standards into their SIPs, thus making these provisions enforceable by both EPA and citizens under the CAA. *See, e.g.*, 42 U.S.C. 7413; 42 U.S.C. 7604(a)(1), (f)(3). EPA has not been persuaded to change its proposed position based on these comments.

EPA does not disagree that the regulations promulgated by the State

pursuant to the waiver will require control of emissions and thus constitute “regulation” of GHGs under the meaning applied by EPA. However, the principal issue here is whether this regulation occurs under the authority of the Clean Air Act (*i.e.*, “under the Act.”).

In the proposed reconsideration notice, EPA explained that a waiver granted under CAA section 209(b)(1) simply removes the prohibition found in section 209(a) that forbids States from adopting or enforcing their own standards relating to control of emissions from new motor vehicles or new motor vehicle engines. Thus, the grant of the waiver does not lead to regulation “under the Act” because it simply allows California to exercise the same authority to adopt and enforce State emissions standards for new motor vehicles that California could have exercised without the initial prohibition in section 209(a). Several other commenters agreed with EPA’s position and reasoning. They explained that a waiver constitutes a withdrawal of Federal preemption that allows a State to develop its own State standards to regulate vehicle emissions; the waiver does not transform these State standards into Federal standards. Other supporting commenters also assert that there is nothing in the legislative history that supports a conclusion that Congress intended section 209 waivers to result in application of PSD requirements. The opposing comments have not convincingly articulated a mechanism through which EPA’s action granting the waiver in fact requires control of emissions (as opposed to the States action under State law). If EPA granted the waiver alone and the State ultimately decided not to implement its regulation, there would be no control requirement in effect under the CAA.

As explained in the proposed reconsideration notice, EPA also finds it instructive that enforcement of any emission standard by the State after EPA grants a section 209 waiver would occur pursuant to State enforcement authority, not Federal authority. EPA would continue to enforce the Federal emission standards EPA promulgates under section 202. EPA does not enforce the State standard. EPA only conducts testing to determine compliance with the Federal standard promulgated by EPA and any enforcement would be for violation of EPA standards, not the State standards. As one commenter noted, CAA section 209(b)(3) provides that where a State has adopted standards that have been granted a waiver “compliance with such State standards shall be treated as compliance with applicable Federal standards for

purposes of this subchapter,” but does not say that such State standards actually become the Federal standards. Accordingly, EPA finds the absence of legislative history supporting the contrary position, and the language in section 209(b)(3) instructive as Congress clearly recognized the co-existence of the Federal and State standards. This shows Congress did not intend that State regulations replace, or transform State standards into Federal regulations “under the Act.” EPA agrees with supporting commenters’ conclusions summarized here, and is not persuaded to change the proposed position.

EPA has also concluded that the adoption of identical standards by several States under section 177 does not make a pollutant covered by those standards “subject to regulation under the Act” in all States. Like section 209, section 177 only grants States authority to regulate under State authority by removing Federal preemption. Adoption of California standards by other States does not change the fact that those standards are still State standards enforced under State law and Federal law is approved in a SIP. However, EPA agrees that when a State adopts alternate vehicle standards into its SIP pursuant to section 177, and EPA approves the SIP, these standards become enforceable by EPA and citizens under the CAA. Nonetheless, EPA does not agree that this compels an interpretation that any pollutant included in an individual State SIP requirement becomes “subject to regulation” in all States under the CAA. As discussed earlier, EPA rejects the theory that a regulation of a pollutant in one or more States in an EPA-approved implementation plan necessarily makes that pollutant subject to regulation in all States. Such an approach is inconsistent with the fundamental principle of cooperative federalism embodied in the CAA.

In summary, EPA concludes that neither the act of granting a section 209 waiver of preemption for State emission standards nor the EPA-approval of standards adopted into a SIP pursuant to section 177 makes a pollutant “subject to regulation under the Act” in all States for the purposes of the PSD program.

C. Other Issues on Which EPA Solicited Comment

1. Prospective Codification of Interpretation

Through the proposed reconsideration notice, EPA requested comment on whether the Agency should codify its final interpretation of the “subject to regulation” in the statute and regulation

by amending the Federal PSD rules at 40 CFR 52.21. EPA received a number of comments both in support of and opposing codification.

EPA does not believe it is necessary to codify its interpretation in the regulatory text. EPA feels it is important to promptly communicate and apply these final decisions regarding the applicability of the PSD program in light of recent and upcoming actions related to GHGs. More specifically, EPA recently finalized the "Mandatory Reporting of Greenhouse Gases" rule (known as the "Reporting Rule"),¹² which added monitoring requirements for additional GHGs not covered in the Part 75 regulations. Further, EPA is poised to finalize by the end of March 2010 the LDV Rule that will establish controls on GHGs that take effect in Model Year 2012, which starts as early as January 2, 2011. Thus, these actions make it important that EPA immediately apply its final interpretation of the PSD regulations on this issue (as refined in this action). Furthermore, even if EPA modified the text of the Federal rules, many States may continue to proceed under an interpretation of their rules. EPA thus believes overall implementation of PSD permitting programs is facilitated by this notice that describes how existing requirements in Federal regulations at 40 CFR 52.21 are interpreted by EPA and how similar State provisions may be interpreted by States.

Likewise, EPA does not believe it is necessary to re-issue the PSD Interpretive Memorandum. The Agency has not identified any legal requirement for the Agency to re-issue an interpretive rule after a process of reconsideration. No comparable procedure is required after the reconsideration of substantive rule. In the latter situation, a notice of final action is sufficient to conclude the reconsideration process and an Agency may simply decline to revise an existing regulation that remains in effect. EPA has therefore concluded that this notice of final action is sufficient to conclude the reconsideration process initiated on February 17, 2009 and that there is no need to re-issue the entire memorandum in order for EPA to continue applying the interpretation reflected therein, as refined in this notice.

2. Section 821 of the Clean Air Act Amendments of 1990

In the October 7, 2009 notice, EPA also solicited comment on the question of whether section 821 of the Clean Air Act Amendments of 1990 is part of the

Clean Air Act. EPA indicated that the Agency was inclined against continuing to argue that section 821 was not a part of the CAA, as the Office of Air and Radiation and Region 8 had done in briefs submitted to the EAB in the *Deseret* matter. This question bears on the determination of whether the CO₂ monitoring requirements in EPA's Part 75 regulations are requirements "under the Act." In the proposed reconsideration notice, EPA explained that it would be necessary to resolve whether or not the CO₂ monitoring and reporting regulations in Part 75 were promulgated "under the Act" if EPA adopted the monitoring and reporting interpretation. EPA received public comments on both sides of this issue, with one environmental organization pressing EPA to drop the position that section 821 is not a part of the CAA and several industry parties requesting that EPA affirm it.

EPA has not yet made a final decision on this question, and it is not necessary for the Agency to do so at this time. Since EPA is not adopting the monitoring and reporting interpretation, the status of section 821 is not material to the question of whether and when CO₂ is "subject to regulation under the Act." Because there are currently no controls on CO₂ emissions, the pollutant is not "subject to regulation." Given that the provisions in Part 75 do not "regulate" emissions of CO₂, it is unnecessary to determine whether such provisions are "under the Act" or not to determine PSD applicability. Furthermore, the promulgation of EPA's Reporting Rule makes this issue even less material. In that rule, which became effective in December 2009 and required monitoring to begin in January of this year, EPA established monitoring and reporting requirements for CO₂ and other GHGs under sections 114 and 208 of the CAA. Thus, there can be no dispute that monitoring and reporting of CO₂ (as well as other GHGs) is now occurring under the CAA, regardless of the status of section 821 of the 1990 amendments. At this point, the section 821 issue would only become relevant if a court were to find that the monitoring and reporting interpretation is compelled by the CAA and a party subsequently seeks to retroactively enforce such a finding against sources that had not obtained a PSD permit with any limit on CO₂ emissions. If this situation were to arise, EPA will address the section 821 issue as necessary.

3. Timing of When a Pollutant Becomes Subject to Regulation

The October 7, 2009 notice also solicited comment on whether the

interpretation of "subject to regulation" should also more clearly identify the specific date on which PSD regulatory requirements would apply. In the PSD Interpretive Memo, EPA states that the language in the definition of "regulated NSR pollutant" should be interpreted to mean that the fourth part of the definition should "apply to a pollutant upon promulgation of a regulation that requires actual control of emissions." See Memo at 14. After evaluating the underlying statutory requirement in the CAA and the language in all parts of the regulatory definition more closely, EPA proposed to modify its interpretation of the fourth part of the definition with respect to the timing of PSD applicability. The Agency proposed to interpret the term "subject to regulation" in the statute and regulation to mean that PSD requirements apply when the regulations addressing a particular pollutant become final and effective.

Based on public comments and other considerations raised in the proposal, EPA has determined that it is necessary to refine the portion of the PSD Interpretive Memo that addresses the precise point in time when a pollutant becomes subject to regulation for purposes of the PSD program. As a result, while the Memo is otherwise unchanged by the reconsideration proceeding, this final notice will adjust the first paragraph of section II.F of the Memo (bottom of page 14) to reflect EPA's conclusion that it is more appropriate and consistent with the reasoning of the Memo to construe EPA regulations and the CAA to make a pollutant subject to PSD program requirements when the first controls on a pollutant take effect. This refines the approach proposed in the October 7, 2009 notice.

Like the PSD Interpretive Memorandum itself, the refinement to EPA's interpretation described in this final notice is an interpretation of the regulation at 40 CFR 52.21 and the CAA provisions that provide the statutory foundation for EPA's regulations. The refinement reflected in this notice explains, clarifies, and is consistent with existing statutes and the text of regulatory provisions at 40 CFR 52.21(b)(50)(ii) through (iv). Some commenters argued that courts have limited an Agency's ability to fundamentally change a long-standing, definitive, and authoritative interpretation of a regulation¹³ without

¹³ To EPA's knowledge, no court has required a rulemaking procedure when the Agency seeks to issue or change its interpretation of a statute. Nevertheless, EPA has completed this notice and comment proceeding before deciding to adopt the

¹² See 74 FR 56259 (Oct. 30, 2009).

engaging in a notice and comment rulemaking. See, e.g., *Alaska Professional Hunters Association v. FAA*, 177 F.3d 1030, 1033–34 (D.C. Cir. 1999); *Paralyzed Veterans of America v. D.C. Arena L.P.*, 117 F.3d 579, 586 (D.C. Cir. 1997). Since EPA's interpretation of the PSD program regulations is unchanged in most respects by this action, it is not clear that the particular refinement to that interpretation that EPA is making in this action would invoke the doctrine described in these cases. Even if this refinement is viewed as a fundamental change, EPA has completed the revision reflected in this action after a notice and comment process. Furthermore, since EPA initiated a process of reconsidering and soliciting comment on the PSD Interpretive Memo within three months of its issuance, the memorandum had not yet become particularly well-established or long-standing. See *MetWest Inc. v. Secretary of Labor*, 560 F.3d 506, 511 n.4 (D.C. Cir. 2009). Thus, the doctrines reflected in these cases do not preclude the action EPA has taken here to refine its interpretation of the regulations.

The regulatory language of 40 CFR 52.21(b)(50)(iv) does not specify the exact time at which the PSD requirements should apply to pollutants in the fourth category of the definition of “regulated NSR pollutant.” In the PSD Interpretive Memo, EPA states that EPA interprets the language in this definition to mean that the fourth part of the definition should “apply to a pollutant upon promulgation of a regulation that requires actual control of emissions.” See Memo at 14. However, after continuing to consider the underlying statutory requirement in the CAA and the language in all parts of the regulatory definition more closely, EPA proposed in the October 7, 2009 notice to modify its interpretation of the fourth part of the definition with respect to the timing of PSD applicability. In the proposed notice of reconsideration, EPA observed that the term “subject to regulation” in the statute and regulation is most naturally interpreted to mean that PSD requirements apply when the regulations addressing a particular pollutant become final and effective. In addition, EPA expressed a desire to harmonize the application of the PSD requirements with the limitation in the Congressional Review Act (CRA) that a major rule cannot take effect until 60 days after it is published in the **Federal Register**.

In this final notice on reconsideration, based on information provided in public comments, EPA is refining its interpretation of the time the PSD requirements will apply to a newly-regulated pollutant. Under the PSD program, EPA will henceforth interpret the date that a pollutant becomes subject to regulation under the Act to be the point in time when a control or restriction that functions to limit pollutant emissions takes effect or becomes operative to control or restrict the regulated activity. As discussed further below, this date may vary depending on the nature of the first regulatory requirement that applies to control or restrict emissions of a pollutant.

Several public comments observed that a date a control requirement becomes “final and effective” and the date it actually “takes effect” may differ. Some commenters supported these points with reference to Federal court decisions that suggest the date that the terms of a regulation become effective can take more than one form. In one case involving the Congressional Review Act, the United States Court of Appeals for the Federal Circuit observed that the date a regulation may “take effect” in accordance with the CRA is distinct from the “effective date” of the regulation. See *Liesegang v. Sec’y of Veterans Affairs*, 312 F.3d 1368, 1374–75 (Fed. Cir. 2002), *amended on reh’g in part on other grounds*, 65 Fed. Appx. 717 (Fed. Cir. 2003). In this opinion, the court observed that “[t]he ordinary meaning of ‘take effect’ is ‘[t]o be in force; go into operation’” *Id.* at 1375 (quoting Black’s Law Dictionary at 1466 (7th ed. 1999)). Based on this, the court reasoned that the CRA does not “change the date on which the regulation becomes effective” but rather “only affects the date when the rule becomes operative.” *Id.* In another case, the Second Circuit Court of Appeals described a distinction between the date a rule may “take effect” under the CRA, the “effective date” for application of the rule to regulated manufacturers, and the “effective date” for purposes of modifying the Code of Federal Regulations. See *Natural Resources Defense Council v. Abraham*, 355 F.3d 179, 202 (2d Cir. 2004).

The Office of the Federal Register (OFR) uses the term “effective date” to describe the date that amendments in a rulemaking document affect the current Code of Federal Regulations. See **Federal Register Document Drafting Handbook**, at p. 2–10 (Oct. 10, 1998). However, OFR draws a contrast between such a date and the compliance or applicability date of a rule, which is

described as “the date that the affected person must start following the rule.” *Id.* at 2–11. Thus, the “effective date” of a regulation is commonly used to describe the date by which a provision in the Code of Federal Regulations is enacted as law, but it is not necessarily the same as the time when provision enacted in the Code of Federal Regulations is operative on the regulated activity or entity. The latter may be described as the “compliance,” “applicability,” or “takes effect” date.

The terms of the CAA also recognize a similar distinction in some instances. CAA section 112(i)(3)(A) provides that “after the effective date of any emissions standard, limitation or regulation promulgated under this section and applicable to a source, no person may operate such source in violation of such standard, limitation, or regulation except, in the case of an existing source, the Administrator shall establish a compliance date or dates for each category or subcategory of existing sources, which shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the effective date of such standard.” Another example in section 202 of the Act is discussed in more detail below.

Another formulation may be found in Section 553(c) of the APA (5 U.S.C. 553(c)), which provides, with some exceptions, that “[t]he required publication or service of a substantive rule shall be made not less than 30 days before its effective date.” The APA does not define the term “effective date” or make precisely clear whether it is referring to the date a regulation has the force of law or the date by which a regulatory requirement applies to a regulated entity or activity. The APA also separately recognizes the concept of finality of Agency action for purposes of judicial review. See 5 U.S.C. 704.

In the October 7, 2009 notice, EPA did not clearly distinguish between the various forms of the date when a regulatory requirement may become effective. One commenter observed that the EPA analysis in the proposed reconsideration notice appeared to blur the distinction between the “effective date” set by EPA and the date that Congress allows a regulation to become effective under the CRA. EPA in fact discussed all of these concepts in its notice, with part of the discussion focused on the date a regulation becomes “final” and “effective” and a part on when a regulation may “take effect” under the CRA. EPA viewed these forms of the date when a regulation becomes “effective” to be essentially the same, but the case law

revised interpretation of the CAA described in this notice.

suggests that administrative agencies do not necessarily need to harmonize the date that regulatory requirements take effect with the “effective date” of a regulation, meaning the date a regulation has the force of law and amends the Code of Federal Regulations. Since these are distinct concepts, the effective date of a regulation for purposes of amending the CFR may precede the date when a regulatory requirement “takes effect” or when a regulated entity must comply with a regulatory requirement. A regulation may “take effect” subsequent to its stated “effective date” where it has been published in final form but does not require immediate implementation by the agency or compliance by regulated entities.

The key issue raised by EPA in the October 7, 2009 notice was determining which date should be determined by EPA to be the date when a pollutant becomes “subject to regulation” and, thus, the date when the requirements of the PSD permitting program apply to that pollutant. In recognition of the distinction between the “effective date” of the regulation for purposes of amending the CFR and the point at which a regulatory restriction may “take effect,” EPA has considered whether it is permissible to construe sections 165(a)(4) and 169(3) of the CAA to mean that a pollutant becomes “subject to regulation” at the point that a regulatory restriction or control “takes effect.” In the October notice, EPA observed that the use of “subject to” in the Act suggests that PSD requirements are intended to be triggered when those standards become effective for the pollutant. EPA also said that no party is required to comply with a regulation until it has become final and effective. Prior to that date, an activity covered by a rule is not in the ordinary sense “subject to” any regulation. Regardless of whether one interprets regulation to mean monitoring or actual control of emissions, prior to the effective date of a rule there is no regulatory requirement to monitor or control emissions.

The same reasoning applies to the date that a regulation “takes effect,” as that term is used in the judicial decisions described above. Regulated entities are not required to comply with a regulatory requirement until it takes effect. Prior to the date a regulatory requirement takes effect, the activity covered by a rule is not in the ordinary sense subject to any regulation.

As discussed in the PSD Interpretive Memo, as used in the context of the PSD provisions in EPA regulations and the CAA, EPA interprets the term “regulation” in the context of sections

165(a)(4) and 169 of the CAA to mean the act or process of controlling or restricting an activity. This interpretation applies a common meaning of the term regulation reflected in dictionaries.

Thus, EPA agrees with commenters that the term “subject to regulation” used in both the CAA and EPA’s regulations may be construed to mean the point at which a requirement to control a pollutant takes effect. The CAA does not necessarily preclude construing a pollutant to become subject to regulation upon the promulgation date or the date that a regulation becomes final and effective for purposes of amending the CFR or judicial review. However, EPA has been persuaded by public comments that the phrase “subject to regulation” may also be interpreted to mean the date by which a control requirement takes effect.

Indeed, EPA has concluded that the latter interpretation is more consistent with the actual control interpretation reflected in the PSD Interpretive Memo. As one commenter observed, a regulation would have to have become actually effective, in the sense that actual legal obligations created by the regulation have become currently applicable for regulated entities and are no longer merely prospective obligations, before that regulation could make a pollutant subject to actual control. Another commenter noted that a regulated entity has no immediate compliance obligations and cannot be held in violation of the regulation until a legal obligation becomes applicable to them on the “takes effect” date. Thus, based on this reasoning, EPA has decided that it will construe the point at which a pollutant becomes “subject to regulation” within the meaning of section 52.21(b)(50)(iv) of EPA’s regulations to be when a control or restriction is operative on the activity regulated. EPA agrees with commenters that there is generally no legally enforceable obligation to control a pollutant when a regulation is promulgated or, in some instances, even when a regulation becomes effective for some purposes.

Thus, EPA currently interprets the time that a pollutant becomes a “regulated NSR pollutant” under section 52.21(b)(50)(iv) to be the time when a control or restriction on emissions of the pollutant takes effect or becomes operative on the regulated activity. Given EPA’s conclusion that this is a permissible interpretation of the “subject to regulation” language in sections 165(a)(4) and 169(3) of the CAA, EPA will also interpret other parts of section 52.21(b)(50) to make a

pollutant a regulated NSR pollutant on the date that a control requirement takes effect, provided such an interpretation is not inconsistent with the existing language of the regulations.

EPA does not agree with several commenters who suggested that EPA determine that a pollutant does not become subject to regulation until the time that an individual source engages in the regulated activity. EPA does not believe such a reading is consistent with the “subject to regulation” language in the CAA. Even if no source is actually engaged in the activity, once a standard or control requirement has taken effect, no source may engage in the regulated activity without complying with the standard. At this point, the regulated activity and the emissions from that activity are controlled or restricted, thus being subject to regulation within the common meaning of the term regulation used in EPA’s regulations and section 165(a)(4) and 169(3) of the CAA.

Likewise, EPA does not agree with commenters who argued that a pollutant does not become subject to regulation until the date when a source must certify compliance with regulatory requirements or submit a compliance report. In some instances, a compliance report or certification of compliance may not be required until well after the point that a regulation operates to control or restrict the regulated activity. Thus, EPA does not feel that it would be appropriate as a general rule to establish the date when a source certifies compliance or submits its compliance report as the date that a pollutant becomes subject to regulation.

Since the fourth part of the definition of “regulated NSR pollutant” functions as a catch-all provision, it may cover a variety of different types of control requirements established by EPA under the CAA. These different types of regulations may contain a variety of different mechanisms for controlling emissions and have varying amounts of lead time before controls take effect under the particular regulatory framework. Thus, whenever the Agency adopts controls on a new pollutant under a portion of the CAA covered by the fourth part of the definition, EPA anticipates that it will be helpful to States and regulated sources for EPA to identify the date when a new pollutant becomes subject to regulation. In section IV.A of this notice, EPA provides such an analysis for the forthcoming LDV Rule that is anticipated to establish the first controls on GHGs.

EPA has also concluded that it is appropriate to extend the reasoning of this interpretation across all parts of the definition of the term “regulated NSR

pollutant.” The reasoning described above is equally applicable to the regulation of additional pollutants under the specific sections of the Act delineated in the first three parts of the definition of “regulated NSR pollutant.” While the date a control requirement may take effect could vary across sections 109, section 111, and Title VI, EPA does not see any distinction in the applicability of the legal reasoning above to these provisions of the CAA. There should be less variability among rules promulgated under the same statutory section, so EPA does not expect that it will be necessary for EPA to identify the date that a new pollutant becomes subject to regulation each time EPA regulates a new pollutant in a NAAQS or NSPS. EPA can more readily identify the specific dates when controls under such rules take effect.

By way of example, the NSPS under section 111 of the Act preclude operation of a new source in violation of such a standard after the effective date of the standard. *See* 42 U.S.C. 7411(e). Thus, the control requirements in an NSPS take effect on the effective date of the rule. Once such a standard takes effect and operates to preclude operations in violation of the standards, then EPA interprets the statute and EPA’s PSD regulations to also require that the BACT requirement apply to a pollutant that is subject to NSPS. Consistent with the October 7, 2009 proposal, EPA has determined that the existing language in section 52.21(b)(50)(ii) of its regulations may be construed to apply to a new pollutant upon the effective date of an NSPS. This part of the definition covers “[a]ny pollutant that is subject to any standard promulgated under section 111 of the Act.” *See* 40 CFR 52.21(b)(50)(ii). While the word “promulgated” appears in this part of the definition, this term modifies the term “standard” and does not directly address the timing of PSD requirements. Under the language in this part of the definition, the PSD requirements apply when a pollutant becomes “subject to” the underlying standard, which is “promulgated under” section 111 of the Act. Thus, this language can be interpreted to make an NSPS pollutant a regulated NSR pollutant upon the effective date of an NSPS. EPA did not receive any public comments that opposed reading this portion of the definition to invoke PSD requirements upon the effective date of an NSPS. This can logically be extended to be consistent with the general view described above that the time a pollutant becomes subject to regulation is the time when a control requirement

“takes effect.” As discussed above, the effective date of an NSPS is also that date when the controls in an NSPS “take effect.”

Likewise, under section 169(a)(3) of the Act, a source applying for a PSD permit must demonstrate that it will not cause or contribute to a violation of the NAAQS in order to obtain the permit. Once a NAAQS is effective with respect to a pollutant, the standard operates through section 169(a)(3) of the Act and section 52.21(k) of EPA’s regulations to preclude construction of a new source that would cause or contribute to a violation of such standard.

Using the effective date of a NAAQS to determine when a pollutant covered by a NAAQS becomes a regulated NSR pollutant is more consistent with EPA’s general approach for determining when a new NAAQS applies to pending permit applications. EPA generally interprets a revised NAAQS that establishes either a lower level for the standard or a new averaging time for a pollutant already regulated to apply upon the effective date of the revised NAAQS. Thus, unless EPA promulgates a grandfathering provision that allows pending applications to apply standards in effect when the application is complete, a final permit decision issued after the effective date of a NAAQS must consider such a NAAQS. As described above, the effective date of the NAAQS is also the date a NAAQS takes effect through the PSD permitting program to regulate construction of a new or modified source.

Since a NAAQS covering a new pollutant would operate through the PSD permitting program to control emissions of that pollutant from the construction or modification of a major source upon the effective date of the NAAQS, a NAAQS covering a new pollutant takes effect on the effective date of the regulation promulgating the NAAQS. EPA does not agree with one commenter’s suggestion that such a NAAQS would not take effect until the time a State first promulgates limitations for the pollutant in a SIP. Under section 165(a)(3) of the Act and the Federal PSD permitting regulations at 52.21(k), to obtain a PSD permit, a major source must demonstrate that the proposed construction will not cause or contribute to a violation of a NAAQS. Due to these requirements, the PSD program operates to incorporate the NAAQS as a governing standard for permitting construction of large sources. Thus, under the Federal PSD program regulations at least, a new pollutant covered by a NAAQS becomes subject to regulation at a much earlier date. These PSD provisions require emissions

limitations for the NAAQS pollutant before construction at a major source may commence and thereby function to protect the NAAQS from new source construction and modifications of existing major sources in the SIP development period before a completion of the planning process necessary to determine whether additional standards for a new NAAQS pollutant need to be developed. The timing when the NAAQS operates in this manner under SIP-approved programs is potentially more nuanced and depends on whether State laws are sufficiently open-ended to call for application of a new NAAQS as a governing standard for PSD permits upon the effective date. EPA believes that State laws that use the same language as in EPA’s PSD program regulations at 52.21(k) and 51.166(k) are sufficiently open-ended and allow such a NAAQS to “take effect” through the PSD program upon the effective date of the NAAQS. Notwithstanding this complexity in SIP-approved programs, the applicability of the Federal PSD program regulations to a new NAAQS pollutant upon the effective date of the NAAQS is sufficient to determine that a new pollutant is subject to regulation on this date.

In the October 7, 2009 notice, EPA observed that one portion of its existing regulations was not necessarily consistent with this reading of the CAA. For the first class of pollutants described in the definition of “regulated NSR pollutant,” the PSD requirements apply once a “standard has been promulgated” for a pollutant or its precursors. *See* 40 CFR 52.21(b)(50)(i). The use of “has been” in the regulation indicates that a pollutant becomes a “regulated NSR pollutant,” and hence PSD requirements for the pollutant are triggered, on the date a NAAQS is promulgated. Thus, EPA observed in the October 7, 2009 notice that it may not be possible for EPA to read the regulatory language in this provision to make PSD applicable to a NAAQS pollutant upon the effective date of the NAAQS. EPA did not propose to modify the language in 40 CFR 52.21(b)(50)(i) in the October 2009 notice because EPA had not yet reached a final decision to interpret the CAA to mean that a pollutant is subject to regulation on the date a regulatory requirement becomes effective. Since EPA was not proposing to establish a NAAQS for any additional pollutants, the timing of PSD applicability for a newly identified NAAQS pollutant did not appear to be of concern at the time. No public comments on the October 2009 notice addressed this issue. Since EPA is now

adopting a variation of the proposed interpretation with respect to the timing of PSD applicability, EPA believes it will be appropriate to propose a revision of the regulatory language in section 52.21(b)(50)(i) at such time as EPA may consider promulgation of a NAAQS for an additional pollutant. Until that time, EPA will continue to apply the terms of section 52.21(b)(50)(i) of the regulation. This is permissible because, even though EPA believes the better reading of the Act is to apply PSD upon the date that a control requirement “takes effect,” the Agency has not determined in this action that the CAA precludes applying PSD requirements upon the promulgation of a regulation that establishes a control requirement (as a NAAQS does through the PSD provisions).

IV. Application of PSD Interpretive Memo to PSD Permitting for GHGs

A. Date by Which GHGs Will Be “Subject to Regulation”

Although the PSD Interpretive Memo and this reconsideration reflect a broad consideration of the most appropriate legal interpretation and policy for all pollutants regulated under the CAA, the need to clarify this issue as a general matter has been driven by concerns over the effects of GHG emissions on global climate and the contention made by some parties in permit proceedings that EPA began regulating CO₂ as early as the promulgation of monitoring and reporting requirements in EPA’s Part 75 rules to implement section 821 of the CAA Amendments of 1990. The vast majority of public comments on the October 7, 2009 notice focused on the regulation of GHGs under the PSD program. As a result, EPA recognizes that it is critically important at this time for the Agency to make clear when the requirements of the PSD permitting program for stationary sources will apply to GHGs. For the reasons discussed below, GHGs will initially become “subject to regulation” under the CAA on January 2, 2011, assuming that EPA issues final GHG emissions standards under section 202(a) applicable to model year 2012 new motor vehicles as proposed. As a result, with that assumption, the PSD permitting program would apply to GHGs on that date. However, the Tailoring Rule, noted above, proposed various options for phasing in PSD requirements for sources emitting GHGs in various amounts above 100 or 250 tons per year. Since EPA has not yet completed that rulemaking, today’s action concludes only that, under the approach envisioned for the vehicle

standards, GHGs would not be considered “subject to regulation” (and no source would be subject to PSD permitting requirements for GHGs) earlier than January 2, 2011. The final Tailoring Rule will address the applicability of PSD requirements for GHG-emitting sources that are not presently subject to PSD permitting.

EPA’s determination that PSD will begin to apply to GHGs on January 2, 2011 is based on the following considerations: (1) The overall interpretation reflected in the PSD Interpretive Memo; (2) EPA’s conclusion in this notice that a pollutant becomes subject to regulation when controls “take effect,” and (3) the assumption that the agency will establish emissions standards for model year 2012 vehicles when it completes the proposed LDV Rule.

As proposed, the LDV Rule consists of two kinds of standards—fleet average standards determined by the emissions performance of a manufacturer’s fleet of various models, and separate vehicle standards that apply for the useful life of a vehicle to the various models that make up the manufacturer’s fleet. CAA section 203(a)(1) prohibits manufacturers from introducing a new motor vehicle into commerce unless the vehicle is covered by an EPA-issued certificate of conformity for the appropriate model year. Section 206(a)(1) of the CAA describes the requirements for EPA issuance of a certificate of conformity, based on a demonstration of compliance with the emission standards established by EPA under section 202 of the Act. A certification demonstration requires emission testing, and must be done for each model year.

The certificate covers both fleet average and vehicle standards, and the manufacturer has to demonstrate compliance with both of these standards for purposes of receiving a certificate of conformity. The demonstration for the fleet average is based on a projection of sales for the model year, and the demonstration for the vehicle standard is based on emissions testing and other information.

Both the fleet average and vehicle standards in the LDV Rule will require that automakers control or limit GHG emissions from the tailpipes of these vehicles. As such, they clearly constitute “regulation” of GHGs under the interpretation in the PSD Interpretive Memo. This view is consistent with the position originally expressed by EPA in 1978 that a pollutant regulated in a Title II regulation is a pollutant subject to regulation. *See* 42 FR at 57481.

However, the regulation of GHGs will not actually take effect upon promulgation of the LDV Rule or on the effective date of the LDV Rule when the provisions of the rule are incorporated into the Code of Federal Regulations.

Under the LDV Rule, the standards for GHG emissions are not operative until the 2012 model year, which may begin as early as January 2, 2011. In accordance with the requirements of Title II of the CAA and associated regulations, vehicle manufacturers may not introduce a model year 2012 vehicle into commerce without a model year 2012 certificate of conformity. *See* CAA section 203(a)(1). A model year 2012 certificate only applies to vehicles produced during that model year, and the model year production period may begin no earlier than January 2, 2011. *See* CAA section 202(b)(3)(A) and implementing regulations at 40 CFR 85.2302 through 85.2305. Thus, a vehicle manufacturer may not introduce a model year 2012 vehicle into commerce prior to January 2, 2011.

There will be no controls or limitations on GHG emissions from model year 2011 vehicles. The obligation on an automaker for a model year 2012 vehicle would be to have a certificate of conformity showing compliance with the emissions standards for GHGs when the vehicle is introduced into commerce, which can occur on or after January 2, 2011. Therefore, the controls on GHG emissions in the Light Duty Rule will not take effect until the first date when a 2012 model year vehicle may be introduced into commerce. In other words, the compliance obligation under the LDV Rule does not occur until a manufacturer may introduce into commerce vehicles that are required to comply with GHG standards, which will begin with MY 2012 and will not occur before January 2, 2011. Since CAA section 203(a)(1) prohibits manufacturers from introducing a new motor vehicle into commerce unless the vehicle is covered by an EPA-issued certificate of conformity for the appropriate model year, as of January 2, 2011, manufacturers will be precluded from introducing into commerce any model year 2012 vehicle that has not been certified to meet the applicable standards for GHGs.

This interpretation of when the GHG controls in the LDV Rule take effect, and therefore, make GHGs subject to regulation under the Act for PSD purposes, is consistent with the statutory language in section 202(a)(2) of the CAA. This section provides that “any regulation prescribed under paragraph (1) of this subsection (and

any revision thereof) shall *take effect* after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.” See 42 U.S.C. 7521(a)(2) (emphasis added). The final LDV Rule will apply to model years 2012 through 2016. The time leading up to the introduction of model year 2012 is the time that EPA “finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.” Model year 2012 is therefore when the GHG standards in the rule “take effect.”

EPA does not agree with several commenters who have suggested that the GHG standards in the proposed LDV Rule would not take effect until October 1, 2011. The latter date appears to be based on how the National Highway Traffic Safety Administration (NHTSA) determines the beginning of the 2012 model year under the Energy Policy and Conservation Act (EPCA). Under EPCA, a more stringent CAFE standard must be prescribed by NHTSA at least 18 months before the beginning of the model year. For purposes of this EPCA provision, NHTSA has historically construed the beginning of the model year to be October 1 of the preceding calendar year. See 49 U.S.C. 32902(g)(2); 74 FR 49454, 49644 n.447 (Sep. 28, 2009). Although EPA has endeavored to harmonize its section 202(a) standards with the NHTSA CAFE standards, EPA’s standards are promulgated under distinct legal authority in the CAA. Thus, the section 202(a) standards promulgated in the LDV Rule are not subject to EPCA or NHTSA’s interpretation of when a model year begins for purposes of EPCA. Under EPA’s planned LDV Rule, model year 2012 vehicles may be introduced into commerce as early as January 2, 2011. Although as a practical matter, some U.S. automakers may not begin introducing model year 2012 vehicles into commerce until later in 2011, they may nevertheless do so as early as January 2, 2011 under EPA’s regulations. Consistent with the discussion above, EPA construes the phrase “subject to regulation” in section 165(a)(4) and 169(3) of the Act to mean that the BACT requirement applies when controls on a pollutant first apply to a regulated activity, and not the point at which an entity first engages in the regulated activity. In this instance, the regulated activity is the introduction of model year 2012 vehicles into commerce. As of January 2, 2011, a

manufacturer may not engage in this activity without complying with the applicable GHG standards.

Likewise, EPA does not agree with commenters who argued that EPA should not consider the GHG controls in the LDV Rule to take effect until automakers have to demonstrate compliance with the fleet average standards at the end of the model year, based on actual vehicle model production. As discussed above, the LDV Rule includes both fleet average standards and vehicle standards that apply to individual vehicles throughout their useful lives. As discussed above, both of these standards for GHG emissions are operative on model year 2012 vehicles introduced into commerce on or after January 2, 2011. Thus, controls on GHG emissions from automobiles will take effect prior to the date that a manufacturer must demonstrate compliance with the fleet average standards. The fact that the manufacturer demonstrates final compliance with the fleet average at a later date, based on production for the entire year, does not change the fact that their conduct was controlled by both the fleet average and the vehicle standards, and subject to regulation, prior to that date.

B. Implementation Concerns

A substantial number of commenters requested that EPA defer application of the PSD program requirements to GHGs based on various practical implementation considerations, and several of these comments argued that the CAA affords EPA the discretion to set an implementation date based on such concerns. EPA agrees that application of PSD program requirements to GHGs presents several significant implementation challenges for EPA, States and other entities that issue permits, and the sources that must obtain permits. Indeed, many of the public comments have illustrated the magnitude of the challenge beyond what is described in the proposed notice on reconsideration of the PSD Interpretive Memo and the proposed Tailoring Rule.

In recognition of the substantial challenges associated with incorporating GHGs into the PSD program, EPA’s preference would be to establish a specific date when the PSD permitting requirements initially apply to GHGs based solely on these practical implementation considerations. However, EPA has not been persuaded that it has the authority to proceed in this manner. While EPA may have discretion as to the manner and time for regulating GHG emissions under the CAA, once EPA has determined to

regulate a pollutant in some form under the Act and such regulation is operative on the regulated activity, the terms of the Act make clear that the PSD program is automatically applicable.

Nonetheless, given the substantial magnitude of the PSD implementation challenges presented by the regulation of GHGs, EPA proposed in the Tailoring Rule to at least temporarily limit the scope of GHG sources covered by the PSD program to ensure that permitting authorities can effectively implement it. EPA based the proposal primarily on two legal doctrines: The “absurd results” doctrine, which EPA proposed to apply on the basis that Congress did not envision that the PSD program would apply to the many small sources that emit GHGs; and the “administrative necessity” doctrine, which EPA proposed to apply because of the extremely large administrative burdens that permitting authorities would confront in permitting the GHG sources. In comment on that action, as well as in comments on the PSD Interpretive Memo reconsideration proposal, EPA received numerous suggestions that it is necessary to limit the scope of sources covered at the time GHGs become subject to regulation. Commenters further stated that it is necessary to select a “trigger date” for GHG permitting that takes into account the time needed for permitting authorities to adopt any scope-limiting measures (including the need to amend State law), to secure the necessary additional financial and other resources, and to hire and train the staff needed to respond to the increase in permitting workload. These comments make clear that more time will be needed beyond January 2, 2011 before permitting of many GHG stationary sources can begin. Thus, EPA will be taking additional action in the near future in the context of the Tailoring Rule to address GHG-specific circumstances that will exist beyond January 2, 2011.

C. Interim EPA Policy To Mitigate Concerns Regarding GHG Emissions From Construction or Modification of Large Stationary Sources

While EPA has concluded that GHGs will not become subject to regulation (and hence the PSD BACT requirement will not apply to them) earlier than January 2, 2011, permitting authorities that issue permits before January 2, 2011 are already in a position to, and should, use the discretion currently available under the BACT provisions of the PSD program to promote technology choices for control of criteria pollutants that will also facilitate the reduction of GHG emissions. More specifically, the CAA

BACT definition requires permitting authorities selecting BACT to consider the reductions available through application of not only control methods, systems, and techniques, but also through production processes, and requires them to take into account energy, environmental, and economic impacts. Thus, the statute expresses the need for a comprehensive review of available pollution control methods when evaluating BACT that clearly requires consideration of energy efficiency. The consideration of energy efficiency is important because it contributes to reduction of pollutants to which the PSD requirements currently apply and have historically been applied. Further, although BACT does not now apply to GHG, BACT for other pollutants can, through application of more efficient production processes, indirectly result in lower GHG emissions.

Neither the statute nor EPA regulations specify precisely how to address energy efficiency in BACT determinations, nor has EPA fully articulated how to take climate considerations into account under the “energy, environmental, and economic impacts” considerations of BACT. Further, while EPA’s BACT guidance for currently regulated pollutants has addressed some facets of these issues, EPA believes that, given the potential importance of the indirect GHG benefits, it will be useful for EPA to summarize this guidance and further clarify it as necessary in order to further illustrate where PSD permitting authorities should be using existing BACT authority for pollutants that are presently regulated in ways that can indirectly address concerns about GHG emissions from large stationary sources. EPA is developing such guidance and plans to issue it in the near future.

D. Transition for Pending Permit Applications

Some commenters requested that EPA address the question of how the application of PSD requirements to GHGs will affect applications for PSD permits that are pending on the date GHGs initially become “subject to regulation.” These commenters generally asked that EPA establish an exclusion for any PSD permit application that was submitted in complete form before the date on which PSD begins to apply to GHGs.

In light of EPA’s conclusion that pollutants become subject to regulation for PSD purposes when control requirements on that pollutant take effect and that such requirements will not take effect for GHGs until January 2,

2011 if EPA finalizes the proposed LDV Rule as anticipated, EPA does not see any grounds to establish a transition period for permit applications that are pending before GHGs become subject to regulation. As a general matter, permitting and licensing decisions of regulatory agencies must reflect the law in effect at the time the agency makes a final determination on a pending application. See *Ziffrin v. United States*, 318 U.S. 73, 78 (1943); *State of Alabama v. EPA*, 557 F.2d 1101, 1110 (5th Cir. 1977); *In re: Dominion Energy Brayton Point, LLC*, 12 E.A.D. 490, 614–616 (EAB 2006); *In re Phelps Dodge Corp.*, 10 E.A.D. 460, 478 n.10 (EAB 2002). Thus, in the absence of an explicit transition or grandfathering provision in the applicable regulations (and assuming EPA finalizes the LDV Rule as planned), each PSD permit issued on or after January 2, 2011 would need to contain provisions that satisfy the PSD requirements that will apply to GHGs as of that date.

Under certain circumstances, EPA has previously allowed proposed new major sources and major modifications that have submitted a complete PSD permit application before a new requirement becomes applicable under PSD regulations, but have not yet received a final and effective PSD permit, to continue relying on information already in the application rather than immediately having to amend applications to demonstrate compliance with the new PSD requirements. In such a way, these proposed sources and modifications were “grandfathered” or exempted from the new PSD requirements that would otherwise have applied to them.

For example, EPA adopted a grandfathering provision when it changed the indicator for the particulate matter NAAQS from total suspended particulate matter (TSP) to particulate matter less than 10 microns (PM₁₀). The Federal PSD regulations at 40 CFR 52.21(i)(1)(x) provide that the owners or operators of proposed sources or modifications that submitted a complete permit application before July 31, 1987, but did not yet receive the PSD permit, are not required to meet the requirements for PM₁₀, but could instead satisfy the requirements for TSP that were previously in effect.

In addition, EPA has allowed some grandfathering for permit applications submitted before the effective date of an amendment to the PSD regulations establishing new maximum allowable increases in pollutant concentrations (also known as PSD “increments”). The Federal PSD regulations at 40 CFR 52.21(i)(10) provide that proposed

sources or modifications that submitted a complete permit application before the effective date of the increment in the applicable implementation plan are not required to meet the increment requirements for PM₁₀, but could instead satisfy the increment requirements for TSP that were previously in effect. Also, 40 CFR 52.21(i)(9) provides that sources or modifications that submitted a complete permit application before the provisions embodying the maximum allowable increase for nitrogen oxides (NO_x)¹⁴ took effect, but did not yet receive a final and effective PSD permit, are not required to demonstrate compliance with the new increment requirements to be eligible to receive the permit.

Under the particular circumstances presented by the forthcoming application of PSD requirements to GHGs, EPA does not see a justification for adopting an explicit grandfathering provision of the nature described above. Permit applications submitted prior to the publication of this notice should in most cases be issued prior to January 2, 2011 and, thus, effectively have a transition period of nine months to complete processing before PSD requirements become applicable. Additional time for completion of action on applications submitted prior to the onset of PSD requirements for GHGs therefore does not appear warranted to ensure a smooth transition and avoid delays for pending applications. To the extent any pending permit review cannot otherwise be completed within the next nine months based on the requirements for pollutants other than GHGs, it should be feasible for permitting authorities to begin incorporating GHG considerations into permit reviews in parallel with the completion of work on other pollutants without adding any additional delay to permit processing.

Furthermore, the circumstances surrounding the onset of requirements for GHGs are distinguishable from prior situations where EPA has allowed grandfathering of applications that were deemed complete prior to the applicability new PSD permitting requirements. First, this action and the PSD Interpretive Memo do not involve a revision of the PSD permitting regulations but rather involves clarifications of how EPA interprets the existing regulatory text. This action articulates what has, in most respects, been EPA’s longstanding practice. It has been EPA’s consistent position since

¹⁴ The increments for emissions of the various oxides of nitrogen are expressed as concentrations of nitrogen dioxide (NO₂).

1978 that regulation of a pollutant under Title II triggers PSD requirements for such a pollutant. *See* 42 FR 57481. Thus, permitting authorities and permit applicants could reasonably anticipate that completion of the LDV Rule would trigger PSD and prepare for this action. Many commenters interpreted EPA's October 7, 2009 notice as proposing to trigger PSD requirements within 60 days of the promulgation of the LDV Rule rather than the January 2, 2011 date that EPA has determined to be the date the controls in that rule take effect. Second, there are presently no regulatory requirements in effect for GHGs. On the other hand, at the time EPA moved from using TSP to using PM₁₀ as the indicator for the particulate matter NAAQS, grandfathered sources were still required to satisfy PSD requirements for particulate matter based on the TSP indicator. Likewise, when EPA later updated the PSD increment for particulate matter to use the PM₁₀ indicator, the grandfathered sources were still required to demonstrate that they would not cause or contribute to a violation of the particulate matter increment based on TSP. In the case of the adoption of the NO₂ increment, grandfathered sources were still required to demonstrate that they would not cause or contribute to a violation of the NO₂ NAAQS. In contrast, for GHGs, there are no measures currently in effect that serve to limit emission of GHGs from stationary sources.

For these reasons, EPA does not intend to promulgate a transition or grandfathering provision that exempts pending permit applications from the onset of GHG requirements in the PSD program. As discussed above, in the absence of such a provision, PSD permits that are issued on or after January 2, 2011 (in accordance with limitations promulgated in the upcoming Tailoring Rule) will be required to contain provisions that fulfill the applicable program requirements for GHGs.

V. PSD Program Implementation by EPA and States

Consistent with the PSD Interpretive Memo, the refined interpretation reflected in this notice (that a pollutant subject to actual control becomes subject to regulation at the time such controls take effect) is an interpretation of the language in 40 CFR 52.21(b)(50) of EPA's regulations. EPA will apply the PSD Interpretive Memo, with the refinement described above, when implementing the Federal permitting program under 40 CFR 52.21. Furthermore, EPA will expect that

States that implement the Federal PSD permit program under delegation from an EPA Regional Office will do the same.

In addition, EPA will apply the interpretation reflected in this notice and the PSD Interpretive Memo in its oversight of existing State programs and review and approval of new program submissions. Many States implement the PSD program pursuant to State laws that have been approved by EPA as part of the SIP, pursuant to a determination by EPA that such laws meet the PSD program criteria set forth in 40 CFR 51.166. The EPA regulation setting forth PSD program requirements for SIPs also includes the same definition of the term "regulated NSR pollutant" as the Federal program regulation. *See* 40 CFR 51.166(b)(49). Because this regulation uses the same language as contained in 40 CFR 52.21 and the same considerations apply to implementation of the PSD program under State laws, EPA will interpret section 51.166(b)(49) in the same manner as section 52.21(b)(50). However, in doing so, EPA will be mindful that permitting authorities in SIP-approved States have some independent discretion to interpret State laws, provided those interpretations are consistent with minimum requirements under the Federal law.

To the extent approved SIPs contain the same language as used in 40 CFR 52.21(b)(50) or 40 CFR 51.166(b)(49), SIP-approved State permitting authorities may interpret that language in State regulations in the same manner reflected in the PSD Interpretive Memo and this notice. However, EPA will not seek to preclude actions to address GHGs in PSD permitting actions prior to January 2, 2011 where a State permitting authority feels it has the necessary legal foundation and resources to do so.

EPA has not called on any States to make a SIP submission that addresses the interpretive issues addressed in this notice and the PSD Interpretive Memo. As long as States are applying their approved program regulations consistent with the minimum program elements established in 40 CFR 51.166, EPA does not believe it will be necessary to issue a SIP call for all States to address this issue. However, permitting authorities in SIP-approved States do not have the discretion to apply State laws in a manner that does not meet the minimum Federal standards in 40 CFR 51.166, as interpreted and applied by EPA. Thus, if a State is not applying the PSD requirements to GHGs for the required sources after January 2, 2011, or lacks the legal authority to do so, EPA will

exercise its oversight authority as appropriate to call for revisions to SIPs and to otherwise ensure sources do not commence construction without permits that satisfy the minimum requirements of the Federal PSD program.

To enable EPA to assess the consistency of a State's action with any PSD program requirements for GHGs, States should ensure that the record for each PSD-permitting decision addresses whether the State has elected to follow EPA's interpretation or believes it is appropriate to apply a different interpretation of State laws that is nonetheless consistent with the requirements of EPA's PSD program regulations. In light of additional actions to be taken by EPA in the Tailoring Rule, States that issue permits in the near term may want to preserve the discretion to modify their approach after other EPA actions are finalized. In light of this contingency, one option States may consider is to establish that the State will not interpret its laws to require PSD permits for sources that are not required to obtain PSD permits under EPA regulations.

VI. Application of the Title V Program to Sources of GHGs

Although the PSD Interpretive Memorandum and the October 7, 2009 proposed reconsideration notice addressed only PSD permitting issues, EPA received several comments on the proposed reconsideration that also addressed the application of Title V permitting requirements to GHGs. Most of these comments urged EPA to apply the same approach for determining major source applicability for Title V permitting that EPA applies to PSD. EPA has in fact been following the PSD approach in many respects. As with the PSD program, currently GHGs are not considered to be subject to regulation and have not been considered to trigger applicability under Title V. EPA discussed this in the preamble to the proposed Tailoring Rule as described below. *See* 74 FR at 55300 n.8.

Title V requires, among other things, that any "major source"—defined, as relevant here, under CAA sections 302(j) and 501(2)(b), as "any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant * * *"—apply for a Title V permit. EPA interprets this requirement to apply to sources of pollutants "subject to regulation" under the Act. EPA previously articulated its interpretation that this Title V permitting requirement applies to "pollutants subject to regulation" in a 1993 memorandum from EPA's air

program. Memorandum from Lydia N. Wegman, Deputy Director, Office of Air Quality Planning and Standards, U.S. EPA, "Definition of Regulated Air Pollutant for Purposes of Title V" (Apr. 26, 1993) ("Wegman Memo"). EPA continues to maintain this interpretation. The interpretation in this memorandum was based on: (1) EPA's reading of the definitional chain for "major source" under Title V, including the definition of "air pollutant" under section 302(g) and the definition of "major source" under 302(j); (2) the view that Congress did not intend to require a variety of sources to obtain Title V permits if they are not otherwise regulated under the Act (*see also* CAA section 504(a), providing that Title V permits are to include and assure compliance with applicable requirements under the Act); and (3) consistency with the approach under the PSD program. While the specific narrow interpretation in the Wegman Memo of the definition of "air pollutant" in CAA section 302(g) is in question in light of *Massachusetts* (finding this definition to be "sweeping"), EPA believes the core rationale for its interpretation of the applicability of Title V remains sound. EPA continues to maintain its interpretation, consistent with CAA sections 302(j), 501, 502 and 504(a), that the provisions governing Title V applicability for "a major stationary source" can only be triggered by emissions of pollutants subject to regulation. This interpretation is based primarily on the purpose of Title V to collect all regulatory requirements applicable to a source and to assure compliance with such requirements—*see, e.g.*, CAA section 504(a)—and on the desire to promote consistency with the approach under the PSD program.

In applying this interpretation under Title V, the Wegman Memo also explains that EPA does not consider CO₂ to be a pollutant subject to regulation based on the monitoring and reporting requirements of section 821 of the Clean Air Act Amendments of 1990. As articulated in numerous orders issued by EPA in response to petitions to object to Title V permits, EPA views the Title V operating permits program as a vehicle for ensuring that air quality control requirements are appropriately applied to facility emission units and that compliance with these

requirements is assured. *See, e.g., In the Matter of Fort James Camas Mill*, Petition No. X-1999-1 at 3-4 (Dec. 22, 2000); *In the Matter of Cash Creek Generation, LLC*, Petition Nos. IV-2008-1 & IV-2008-2 at 2 (Dec. 15, 2009). The Wegman Memo points out that section 821 involves reporting and study of emissions, but is not related to actual control of emissions. Since the reporting requirements of section 821 have no connection to existing air quality control requirements, it is appropriate not to treat them as making CO₂ "subject to regulation" for purposes of Title V. *Cf.* Section 504(b) (providing EPA authority to specify requirements for "monitoring and analysis of pollutants regulated under this Act.").

EPA has not previously explicitly considered the question of when a pollutant becomes "subject to regulation" under this established interpretation of the Title V requirements.¹⁵ EPA received comments in this reconsideration proceeding specifically on the question of when a pollutant becomes subject to regulation for purposes of Title V. In light of these comments, and the decision to adopt a "takes effect" approach for PSD, EPA believes it is appropriate to address this issue for Title V with respect to GHG.

EPA is mindful of the different purposes for the PSD and Title V programs under the statute. While PSD results in substantive control requirements as necessary to meet air quality goals, Title V is focused on identifying, collecting, and assuring compliance with other Act requirements (including PSD), and generally does not itself result in new control requirements. Nevertheless, as reflected in the Wegman Memo, the two programs have historically followed the same approach for determining when a pollutant is "subject to regulation."¹⁶ EPA believes that a "takes effect" approach to the triggering of new pollutants is desirable and appropriate

¹⁵ The preamble to the proposed Tailoring Rule implicitly assumed that a pollutant will become "subject to regulation" for PSD and Title V at the same time (and, in one case, suggests that time will be on promulgation of the LDV Rule). The latter statement was based on the interpretation in the current PSD Interpretive Memorandum, but failed to note that EPA had proposed to change that interpretation in the October 7, 2009 notice (signed the same day as the proposed Tailoring Rule). *See* 74 FR at 55300 and 55340-41.

¹⁶ Wegman Memo at 5.

for Title V, for many of the reasons described above for PSD. EPA is therefore generally inclined to follow the approach adopted today for PSD, and concludes that GHGs are "subject to regulation," for purposes of determining whether a source of GHGs is a "major source" for Title V, no earlier than the date on which a control requirement for GHGs "takes effect." EPA currently anticipates that the LDV Rule will be the first control requirement for GHGs to take effect. Under this approach, as with PSD, if the LDV Rule takes effect as of January 2, 2011, a source that is not currently subject to Title V for its GHG emissions could become so no earlier than January 2, 2011.¹⁷

Finally, as with PSD, EPA expects that, beyond January 2, 2011, there will remain significant administrative and programmatic considerations associated with permitting of GHGs under Title V. In light of this, as discussed above with regard to PSD permitting, EPA will be further addressing in the final Tailoring Rule (to be promulgated in the near future) the manner in which sources can become subject to Title V as a result of their GHG emissions.

VII. Statutory Authority

The statutory authority for this action is provided by section 553 of the Administrative Procedure Act (5 U.S.C. 553) and the Clean Air Act (CAA), as amended (42 U.S.C. 7401 *et seq.*). Relevant portions of the CAA include, but are not necessarily limited to, sections 101, 165, 169, 301, 302, 307, 501, 502, and 504 (42 U.S.C. 7401, 7475, 7479, 7601, 7602, 7607, 7661, 7661a, and 7661d).

VIII. Judicial Review

This action is a nationally applicable final action under section 307(b) of the Act. As a result, any legal challenges to this action must be brought to the United States Court of Appeals for the District of Columbia Circuit by June 1, 2010.

Dated: March 29, 2010.

Lisa P. Jackson,
Administrator.

[FR Doc. 2010-7536 Filed 4-1-10; 8:45 a.m.]

BILLING CODE 6560-50-P

¹⁷ This date is also when EPA expects the first CAA control program addressing GHGs at stationary sources (*i.e.*, the PSD program) to be in place.

RULE 4

**75 Fed. Reg. 31,514
(June 3, 2010)
(Tailoring Rule)**



Federal Register

**Thursday,
June 3, 2010**

Part II

Environmental Protection Agency

40 CFR Parts 51, 52, 70, et al.

**Prevention of Significant Deterioration
and Title V Greenhouse Gas Tailoring
Rule; Final Rule**

ENVIRONMENTAL PROTECTION AGENCY**40 CFR Parts 51, 52, 70, and 71**

[EPA-HQ-OAR-2009-0517; FRL-9152-8]

RIN 2060-AP86

Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule**AGENCY:** Environmental Protection Agency (EPA).**ACTION:** Final rule.

SUMMARY: EPA is tailoring the applicability criteria that determine which stationary sources and modification projects become subject to permitting requirements for greenhouse gas (GHG) emissions under the Prevention of Significant Deterioration (PSD) and title V programs of the Clean Air Act (CAA or Act). This rulemaking is necessary because without it PSD and title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year (tpy) levels provided under the CAA, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of

the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to GHG sources, starting with the largest GHG emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from PSD and title V permitting for GHG emissions until at least April 30, 2016.

DATES: This action is effective on August 2, 2010.

ADDRESSES: EPA has established a docket for this rulemaking under Docket ID No. EPA-HQ-OAR-2009-0517. All documents in the docket are listed in the <http://www.regulations.gov> index. Although listed in the index, some information is not publicly available, e.g., Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy. Publicly available docket materials are available either electronically in <http://www.regulations.gov> or in hard copy at the EPA Docket Center EPA/DC, EPA West, Room 3334, 1301 Constitution

Avenue, Northwest, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the EPA Docket Center is (202) 566-1742.

FOR FURTHER INFORMATION CONTACT: Mr. Joseph Mangino, Air Quality Policy Division, Office of Air Quality Planning and Standards (C504-03), Environmental Protection Agency, Research Triangle Park, NC 27711; telephone number: (919) 541-9778; fax number: (919) 541-5509; e-mail address: mangino.joseph@epa.gov.

SUPPLEMENTARY INFORMATION:**I. General Information***A. Does this action apply to me?*

Entities affected by this action include sources in all sectors of the economy, including commercial and residential sources. Entities potentially affected by this action also include States, local permitting authorities, and tribal authorities. The majority of categories and entities potentially affected by this action are expected to be in the following groups:

Industry group	NAICS ^a
Agriculture, fishing, and hunting	11.
Mining	21.
Utilities (electric, natural gas, other systems)	2211, 2212, 2213.
Manufacturing (food, beverages, tobacco, textiles, leather)	311, 312, 313, 314, 315, 316.
Wood product, paper manufacturing	321, 322.
Petroleum and coal products manufacturing	32411, 32412, 32419.
Chemical manufacturing	3251, 3252, 3253, 3254, 3255, 3256, 3259.
Rubber product manufacturing	3261, 3262.
Miscellaneous chemical products	32552, 32592, 32591, 325182, 32551.
Nonmetallic mineral product manufacturing	3271, 3272, 3273, 3274, 3279.
Primary and fabricated metal manufacturing	3311, 3312, 3313, 3314, 3315, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329.
Machinery manufacturing	3331, 3332, 3333, 3334, 3335, 3336, 3339.
Computer and electronic products manufacturing	3341, 3342, 3343, 3344, 3345, 4446.
Electrical equipment, appliance, and component manufacturing	3351, 3352, 3353, 3359.
Transportation equipment manufacturing	3361, 3362, 3363, 3364, 3365, 3366, 3366, 3369.
Furniture and related product manufacturing	3371, 3372, 3379.
Miscellaneous manufacturing	3391, 3399.
Waste management and remediation	5622, 5629.
Hospitals/Nursing and residential care facilities	6221, 6231, 6232, 6233, 6239.
Personal and laundry services	8122, 8123.
Residential/private households	8141.
Non-Residential (Commercial)	Not available. Codes only exist for private households, construction, and leasing/sales industries.

^a North American Industry Classification System.

B. How is this preamble organized?

The information presented in this preamble is organized as follows:

Outline**I. General Information**

A. Does this action apply to me?

B. How is this preamble organized?

C. Preamble Acronyms and Abbreviations**II. Overview of the Final Rule****III. Background**

A. What are GHGs and their sources?

B. Endangerment Finding and the LDVR

1. Endangerment Finding

2. Light-Duty Vehicle Rule

C. What are the general requirements of the PSD program?

1. Overview of the PSD Program

2. General Requirements for PSD

D. What are the general requirements of the Title V operating permits program?

1. Overview of Title V

2. Title V Permit Requirements

E. The Interpretive Memo

IV. Summary of Final Actions

- A. How do you define the GHG pollutant for PSD and Title V purposes?
1. GHG Pollutant Defined as the Sum-of-Six Well-Mixed GHGs
 2. What GWP values should be used for calculating CO₂e?
- B. When will PSD and Title V applicability begin for GHGs and emission sources?
1. What are the Step 1 thresholds, timing, and calculation methodology?
 2. What are the Step 2 thresholds, timing, and calculation methodology?
 3. What about Step 3?
 4. What about the proposed 6-year exclusion for smaller sources?
 5. When and how will EPA take further action on smaller sources?
- C. How do state, local, and tribal area programs adopt the final GHG applicability thresholds?
- D. How do you treat GHGs for purposes of Title V permit fees?
- E. Other Actions and Issues
1. Timing for Permit Streamlining Techniques
 2. Guidance for BACT Determinations
 3. Requests for Higher Category-Specific Thresholds and Exemptions From Applicability
 4. Transitional Issues Including Requests for Grandfathering
- V. What is the legal and policy rationale for the final actions?
- A. Rationale for Our Approach to Calculating GHG Emissions for PSD and Title V Applicability Purposes
1. Grouping of GHGs Into a Single Pollutant
 2. Identifying Which GHGs Are Included in the Group
 3. Use of GWP vs. Mass-Based GHG Thresholds
 4. Determining What GWP Values Are To Be Used
 5. Use of Short Tons vs. Metric Tons
- B. Rationale for Thresholds and Timing for PSD and Title V Applicability to GHG Emissions Sources
1. Overview
 2. Data Concerning Costs to Sources and Administrative Burdens to Permitting Authorities
 3. "Absurd Results," "Administrative Necessity," and "One-Step-at-a-Time" Legal Doctrines
 4. The PSD and Title V Programs
 5. Application of the "Absurd Results" Doctrine for the PSD Program
 6. Application of the "Absurd Results" Doctrine for the Title V Program
 7. Additional Rulemaking for the PSD and Title V Programs
 8. Rationale for the Phase-in Schedule for Applying PSD and Title V to GHG Sources
 9. "Administrative Necessity" Basis for PSD and Title V Requirements in Tailoring Rule
 10. "One-Step-at-a-Time" Basis for Tailoring Rule
- C. Mechanisms for Implementing and Adopting the Tailoring Approach
1. PSD Approach: Background and Proposal
 2. Rationale for Our Final Approach to Implementing PSD
 3. Other Mechanisms
 4. Codification of Interpretive Memo
 5. Delaying Limited Approvals and Request for Submission of Information From States Implementing a SIP-Approved PSD Program
 6. Title V Programs
- D. Rationale for Treatment of GHGs for Title V Permit Fees
- E. Other Actions and Issues
1. Permit Streamlining Techniques
 2. Guidance for BACT Determinations
 3. Requests for Higher Category-Specific Thresholds or Exemptions From Applicability
 4. Transitional Issues Including Requests for Grandfathering
- VI. What are the economic impacts of the final rule?
- A. What entities are affected by this final rule?
- B. What are the estimated annual benefits to sources due to regulatory relief from the statutory requirements?
1. What are annual estimated benefits or avoided burden costs for title V permits?
 2. What are annual benefits or avoided costs associated with NSR permitting regulatory relief?
- C. What are the economic impacts of this rulemaking?
- D. What are the costs of the final rule for society?
- E. What are the net benefits of this final rule?
- VII. Comments on Statutory and Executive Order Reviews
- A. Comments on Executive Order 12866—Regulatory Planning and Review
- B. Comments on the Paperwork Reduction Act
- C. Comments on the RFA
- D. Comments on the Unfunded Mandates Reform Act
- E. Comments on Executive Order 13132—Federalism
- F. Comments on Executive Order 13175—Consultation and Coordination With Indian Tribal Governments
- G. Comments on Executive Order 13211—Actions That Significantly Affect Energy Supply, Distribution, or Use
- VIII. Statutory and Executive Order Reviews
- A. Executive Order 12866—Regulatory Planning and Review
- B. Paperwork Reduction Act
- C. Regulatory Flexibility Act
- D. Unfunded Mandates Reform Act
- E. Executive Order 13132—Federalism
- F. Executive Order 13175—Consultation and Coordination With Indian Tribal Governments
- G. Executive Order 13045—Protection of Children From Environmental Health and Safety Risks
- H. Executive Order 13211—Actions That Significantly Affect Energy Supply, Distribution, or Use
- I. National Technology Transfer and Advancement Act
- J. Executive Order 12898—Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations
- K. Congressional Review Act
- L. Judicial Review
- IX. Statutory Authority
- C. Preamble Acronyms and Abbreviations*
- The following are abbreviations of terms used in this preamble.
- ANPR Advance Notice of Proposed Rulemaking
- APA Administrative Procedure Act
- AQRVs Air Quality Related Values
- BACT Best Available Control Technology
- Btu British thermal units
- Btu/hr British thermal units per hour
- CAA or Act Clean Air Act
- CAAAC Clean Air Act Advisory Committee
- CAFE Corporate Average Fuel Economy
- CH₄ Methane
- CO Carbon Monoxide
- CO₂ Carbon Dioxide
- CO₂e Carbon Dioxide Equivalent
- EPA U.S. Environmental Protection Agency
- FDA Food and Drug Administration
- FIP Federal Implementation Plan
- FTEs Full-Time Equivalents
- GHG Greenhouse Gas
- GHz Gigahertz
- GWP Global Warming Potential
- HAP Hazardous Air Pollutant
- HFCs Hydrofluorocarbons
- ICR Information Collection Request
- IPCC Intergovernmental Panel on Climate Change
- LDVR Light-Duty Vehicle Rule
- MACT Maximum Achievable Control Technology
- MCL Maximum Contaminant Level
- N₂O Nitrous Oxide
- NAAQS National Ambient Air Quality Standard
- NHTSA National Highway Traffic Safety Administration
- NMOC Nonmethane Organic Compounds
- NO_x Nitrogen Oxides
- NPDES National Pollutant Discharge Elimination System
- NSPS New Source Performance Standard
- NSR New Source Review
- NTAA National Tribal Air Association
- NTTAA National Technology Transfer and Advancement Act
- OMB Office of Management and Budget
- PFCs Perfluorocarbons
- PM Particulate Matter
- PSD Prevention of Significant Deterioration
- PTE Potential to Emit
- RFA Regulatory Flexibility Act
- RIA Regulatory Impact Analysis
- RTC Response to Comment
- SBA Small Business Administration
- SBAR Small Business Advocacy Review
- SBREFA Small Business Regulatory Enforcement Fairness Act
- SF₆ Sulfur Hexafluoride
- SIP State Implementation Plan
- SNPR Supplemental Notice of Proposed Rulemaking
- TIP Tribal Implementation Plan
- TRS Total Reduced Sulfur
- TSD Technical Support Document
- tpy Tons Per Year
- UMRA Unfunded Mandates Reform Act
- UNFCCC United Nations Framework Convention on Climate Change
- VOC Volatile Organic Compound

II. Overview of the Final Rule

EPA is relieving overwhelming permitting burdens that would, in the absence of this rule, fall on permitting authorities and sources. We accomplish this by tailoring the applicability criteria that determine which GHG emission sources become subject to the PSD and title V programs¹ of the CAA. In particular, EPA is establishing with this rulemaking a phase-in approach for PSD and title V applicability, and is establishing the first two steps of the phase-in for the largest emitters of GHGs. We also commit to certain follow-up actions regarding future steps beyond the first two, discussed in more detail later. Our legal basis for this rule is our interpretation of the PSD and title V applicability provisions under the familiar *Chevron*² two-step framework for interpreting administrative statutes, taking account of three legal doctrines, both separately and interdependently: They are what we will call (1) The “absurd results” doctrine, which authorizes agencies to apply statutory requirements differently than a literal reading would indicate, as necessary to effectuate congressional intent and avoid absurd results; (2) the “administrative necessity” doctrine, which authorizes agencies to apply statutory requirements in a way that avoids impossible administrative burdens; and (3) the “one-step-at-a-time” doctrine, which authorizes agencies to implement statutory requirements a step at a time. This legal basis justifies each of the actions we take with this rule—e.g., each of the first two steps of the phase-in approach—both (1) as part of the overall tailoring approach, and (2) independently of each other action we take with this rule. EPA also has authority for this Tailoring Rule under CAA section 301(a)(1), which authorizes the Administrator “to prescribe such regulations as are necessary to carry out his functions under [the CAA].”

For the first step of this Tailoring Rule, which will begin on January 2, 2011, PSD or title V requirements will apply to sources’ GHG emissions only if the sources are subject to PSD or title V anyway due to their non-GHG pollutants. Therefore, EPA will not require sources or modifications to evaluate whether they are subject to PSD or title V requirements solely on

account of their GHG emissions. Specifically, for PSD, Step 1 requires that as of January 2, 2011, the applicable requirements of PSD, most notably, the best available control technology (BACT) requirement, will apply to projects that increase net GHG emissions by at least 75,000 tpy carbon dioxide equivalent (CO₂e), but only if the project also significantly increases emissions of at least one non-GHG pollutant. For the title V program, only existing sources with, or new sources obtaining, title V permits for non-GHG pollutants will be required to address GHGs during this first step.

The second step of the Tailoring Rule, beginning on July 1, 2011, will phase in additional large sources of GHG emissions. New sources as well as existing sources not already subject to title V that emit, or have the potential to emit, at least 100,000 tpy CO₂e will become subject to the PSD and title V requirements. In addition, sources that emit or have the potential to emit at least 100,000 tpy CO₂e and that undertake a modification that increases net emissions of GHGs by at least 75,000 tpy CO₂e will also be subject to PSD requirements. For both steps, we also note that if sources or modifications exceed these CO₂e-adjusted GHG triggers, they are not covered by permitting requirements unless their GHG emissions also exceed the corresponding mass-based triggers (i.e., unadjusted for CO₂e.)

EPA believes that the costs to the sources and the administrative burdens to the permitting authorities of PSD and title V permitting will be manageable at the levels in these initial two steps, and that it would be administratively infeasible to subject additional sources to PSD and title V requirements at those times. However, we also intend to issue a supplemental notice of proposed rulemaking (SNPR) in 2011, in which we will propose or solicit comment on a third step of the phase-in that would include more sources, beginning by July 1, 2013. In the same rulemaking, we may propose or solicit comment on a permanent exclusion from permitting for some category of sources, based on the doctrine of “absurd results,” within the *Chevron* framework. We are establishing an enforceable commitment that we will complete this rulemaking by July 1, 2012, which will allow for 1 year’s notice before Step 3 would take effect.

In addition, we commit to explore streamlining techniques that may well make the permitting programs much more efficient to administer for GHGs, and that therefore may allow their expansion to smaller sources. We expect

that the initial streamlining techniques will take several years to develop and implement.

We are also including in this action a rule that no source with emissions below 50,000 tpy CO₂e, and no modification resulting in net GHG increases of less than 50,000 tpy CO₂e, will be subject to PSD or title V permitting before at least 6 years from now, April 30, 2016. This is because we are able to conclude at the present time that the administrative burdens that would accompany permitting sources below this level will be so great that even the streamlining actions that EPA may be able to develop and implement in the next several years, and even with the increases in permitting resources that we can reasonably expect the permitting authorities to acquire, it will be impossible to administer the permit programs for these sources until at least 2016.

Further, we are establishing an enforceable commitment that we will (1) Complete a study by April 30, 2015, to evaluate the status of PSD and title V permitting for GHG-emitting sources, including progress in developing streamlining techniques; and (2) complete further rulemaking based on that study by April 30, 2016, to address the permitting of smaller sources. That rulemaking may also consider additional permanent exclusions based on the “absurd results” doctrine, where applicable.

This Tailoring Rulemaking is necessary because without it, PSD and title V would apply to all stationary sources that emit or have the potential to emit more than 100 or 250 tons of GHGs per year beginning on January 2, 2011. This is the date when EPA’s recently promulgated Light-Duty Vehicle Rule (LDVR) takes effect, imposing control requirements for the first time on carbon dioxide (CO₂) and other GHGs. If this January 2, 2011 date were to pass without this Tailoring Rule being in effect, PSD and title V requirements would apply at the 100/250 tpy applicability levels provided under a literal reading of the CAA as of that date. From that point forward, a source owner proposing to construct any new major source that emits at or higher than the applicability levels (and which therefore may be referred to as a “major” source) or modify any existing major source in a way that would increase GHG emissions would need to obtain a permit under the PSD program that addresses these emissions before construction or modification could begin. Similarly, title V would apply to a new or existing source exceeding the 100 tpy

¹ Unless otherwise indicated, references in this preamble to “title V,” “title V requirements,” the “title V program,” and similar references are to the operating permit provisions in CAA sections 501–506, and not the “small business stationary source technical and environmental compliance assistance program” under CAA section 507.

² *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837 (1984).

applicability level in the Act, if the source did not already have a title V permit.

Under these circumstances, many small sources would be burdened by the costs of the individualized PSD control technology requirements and permit applications that the PSD provisions, absent streamlining, require. Additionally, state and local permitting authorities would be burdened by the extraordinary number of these permit applications, which are orders of magnitude greater than the current inventory of permits and would vastly exceed the current administrative resources of the permitting authorities. Permit gridlock would result with the permitting authorities able to issue only a tiny fraction of the permits requested.

These impacts—the costs to sources and administrative burdens to permitting authorities—that would result from application of the PSD and title V programs for GHG emissions at the statutory levels as of January 2, 2011, are so severe that they bring the judicial doctrines of “absurd results,” “administrative necessity,” and “one-step-at-a-time” into the *Chevron* two-step analytical framework for statutes administered by agencies. Under the U.S. Supreme Court’s decision in *Chevron*, the agency must, at Step 1, determine whether Congress’s intent as to the specific matter at issue is clear, and, if so, the agency must give effect to that intent.³ If congressional intent is not clear, then, at Step 2, the agency has discretion to fashion an interpretation that is a reasonable construction of the statute.

To determine congressional intent, the agency must first consider the words of the statutory requirements, and if their literal meaning answers the question at hand, then, in most cases, the agency must implement those requirements by their terms. However, under the “absurd results” doctrine, the literal meaning of statutory requirements should not be considered to indicate congressional intent if that literal meaning would produce a result that is senseless or that is otherwise inconsistent with—and especially one that undermines—underlying congressional purpose. In these cases, if congressional intent for how the requirements apply to the question at hand is clear, the agency should implement the statutory requirements not in accordance with their literal meaning, but rather in a manner that most closely effectuates congressional intent. If congressional intent is not

clear, then an agency may select an interpretation that is reasonable under the statute.

Under the “administrative necessity” doctrine, Congress is presumed, at *Chevron* Step 1, to intend that its statutory directives to agencies be administrable, and not to have intended to have written statutory requirements that are impossible to administer. Therefore, under this doctrine, an agency may depart from statutory requirements that, by their terms, are impossible to administer, but the agency may depart no more than necessary to render the requirements administrable. Under the “one-step-at-a-time” doctrine, Congress is presumed at *Chevron* Step 1 to have intended to allow the agency to administer the statutory requirements on a step-by-step basis, as appropriate, when the agency remains on track to implement the requirements as a whole. Each of these doctrines supports our action separately, but the three also are intertwined and support our action in a comprehensive manner.

Here, we have determined, through analysis of burden and emissions data as well as consideration of extensive public comment, that the costs to sources and administrative burdens to permitting authorities that would result from application of the PSD and title V programs for GHG emissions at the statutory levels as of January 2, 2011 should be considered “absurd results.” Therefore, we conclude that under the “absurd results” doctrine, Congress could not have intended that the PSD or title V applicability provisions—in particular, the threshold levels and timing requirements—apply literally to GHG sources as of that date.

Even so, the PSD and title V provisions and their legislative history do indicate a clear congressional intent, under *Chevron* Step 1, as to whether the two permitting programs applied to GHG sources, and that the intent was in the affirmative, that the permitting programs do apply to GHG sources. Our previous regulatory action defining the applicability provisions made this clear, and we do not reopen this issue in this rulemaking. Moreover, even if this long-established regulatory position were not justifiable based on *Chevron* Step 1—on the grounds that in fact, congressional intent on this point is not clear—then we believe that this position, that the statutory provisions to apply PSD and title V generally to GHG sources, was justified under *Chevron* step 2.⁴

⁴ In this preamble and the response to comments document we fully address arguments that commenters and others have presented about congressional intent and coverage of GHGs. We do

As to how to apply the PSD program to GHG sources, congressional intent, as expressed in the various statutory provisions and statements in the legislative history, is clear that PSD should apply at least to the largest sources initially, at least to as many more sources as possible and as promptly as possible over time—consistent with streamlining actions that we intend to consider coupled with increases in permitting authority resources—and at least to a certain point. This is the approach we take in this Tailoring Rule, and because it is consistent with congressional intent, we believe it is required under *Chevron* Step 1. Even if congressional intent were not clear as to how to apply the PSD requirements to GHG sources, we would have authority under *Chevron* Step 2 to establish a reasonable interpretation that is consistent with the PSD provisions, and we believe that the tailoring approach so qualifies.

As for title V, the statutory provisions and legislative history, which of course are different than those concerning the PSD program, do not express a clear intent as to how title V applies to GHG sources, which leads our analysis to *Chevron* Step 2, and here, again, we believe that the tailoring approach is a reasonable interpretation that is consistent with the title V provisions.

For both PSD and title V, we intend to use the tailoring approach to address smaller GHG sources over time, consistent with Congress’s expectations that the programs would not impose undue costs to sources or undue administrative burdens to permitting authorities. However, we cannot say at this point how close to the statutory thresholds we will eventually reach. Because this rule establishes only the first two phases of the tailoring approach, we do not find it necessary to answer these questions in this rule, and instead we expect to resolve them through future rulemaking. We will remain mindful of the concerns that Congress expressed about including small sources in either program. We intend to consider the issue of the applicability of title V to GHG sources without applicable requirements (*i.e.*, “empty permits”) in future steps of our tailoring approach. When we do so, we will further assess the potential for the approach of excluding empty permits from title V to relieve burden consistent with statutory requirements.

In addition, because Congress can be said to have intended the PSD and title

so to be fully responsive, even though we believe that this is a settled matter for which the time for judicial review has passed.

³ *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837, 842–43 (1984).

V programs to apply to GHG sources, the Tailoring Rule is also justifiable under the “administrative necessity” and “one-step-at-a-time” doctrines.

The legal analysis just described justifies each of the actions in this rule. The first two steps that we promulgate in this rule, which take effect on January 2, 2011 and July 1, 2011, constitute the most that permitting authorities can reasonably be expected to do by those times. Similarly, the 50,000 tpy floor that we promulgate through at least April 30, 2016 is reasonable because the information we have available now shows that it constitutes the most that permitting authorities can reasonably be expected to do by that date. Finally, the study and two additional rulemakings—to take effect by July 1, 2013 and April 30, 2016—to which we commit in this rule establish a track for acquiring additional information and for taking further steps to address the application of PSD and title V more closely to the literal statutory levels. We intend to apply them as closely to those levels as is consistent with congressional intent and administrative imperatives, in light of the “absurd results,” “administrative necessity,” and “one-step-at-a-time” doctrines, although, as noted previously, we will consider in future rulemaking how closely to the statutory thresholds we will be able to implement the PSD and title V programs as well as what to require with respect to a potentially large number of sources with empty title V permits.

In this rule, we are adopting regulatory language codifying our phase-in approach. As we will explain, many state, local and tribal area programs will likely be able to immediately implement our approach without rule or statutory changes by, for example, interpreting the term “subject to regulation” that is part of the applicability provisions for PSD and title V. We ask permitting authorities to confirm that they will follow this implementation approach for their programs, and if they cannot, then we ask them to notify us so that we can take appropriate follow-up action to narrow our federal approval of their programs before GHGs become subject to regulation for PSD and title V programs on January 2, 2011. Narrowing our approval will ensure that for federal purposes, GHG sources below the size thresholds we establish in this Tailoring Rule are not obligated to hold PSD or title V permits until the states develop and submit revised PSD and title V programs that EPA approves, either because they adopt our tailoring approach or because, if they continue to cover smaller GHG sources, the states

have demonstrated that they have adequate resources to administer those programs.

The thresholds we are establishing are based on CO₂e for the aggregate sum of six greenhouse gases that constitute the pollutant that will be subject to regulation, which we refer to as GHGs.⁵ These gases are: CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Thus, in this rule, we provide that PSD and title V applicability is based on the quantity that results when the mass emissions of each of these gases is multiplied by the Global Warming Potential (GWP) of that gas, and then summed for all six gases. However, we further provide that in order for a source’s GHG emissions to trigger PSD or title V requirements, the quantity of the GHGs must equal or exceed both the applicability thresholds established in this rulemaking on a CO₂e basis and the statutory thresholds of 100 or 250 tpy on a mass basis.⁶ Similarly, in order for a source to be subject to the PSD modification requirements, the source’s net GHG emissions increase must exceed the applicable significance level on a CO₂e basis and must also result in a net mass increase of the constituent gases combined.

We are adopting this rule after careful consideration of numerous public comments. On October 27, 2009 (74 FR 55292), EPA proposed the GHG Tailoring Rule. EPA held two public hearings on the proposed rule, and received over 400,000 written public comments. The public comment period ended on December 28, 2009. The comments have provided detailed information that has helped EPA understand better the issues and potential impacts of this rule, and the final rule described in this preamble incorporates many of the suggestions we received. We respond to many of these comments in explaining our rationale for the final rule, which is described in section V. The final rule adopts many elements of the proposal but differs from the proposal in several important respects. We proposed to apply PSD and title V to GHG sources that emit or have the potential to emit at least 25,000 tpy CO₂e, and we proposed a PSD significance level in a range between

10,000 and 25,000 tpy CO₂e, but based on consideration of the additional information we received and our further analysis, we are finalizing the threshold levels in the amounts and on the schedule described previously. In addition, the mechanism for state, local, and tribal program implementation has been significantly changed to reflect the comments received that we needed to develop an implementation approach that states could adopt under state law more expeditiously.

The remainder of this notice describes our approach and rationale in more detail. Following this overview, section III of this preamble provides background information on the nature of GHG emissions, recent regulatory developments that affect when and how GHG emissions are subject to stationary source permitting, and the general requirements of the PSD and title V programs. Section IV describes in detail the summary of the key actions being taken in this rule, including the determination of emissions, the thresholds and timing for the phase-in, our approach to implementing the phase-in, and the additional future actions we will take. Section V provides a more detailed description of each action, explaining the policy and legal rationale and responding to comments received. Section V begins with our decisions on how to calculate the mass-based and CO₂e-based emissions used in the phase-in. Section V then turns to our legal and policy rationale for the first two steps of the phase-in, the 50,000 tpy floor, and the subsequent study and rulemakings to determine whether and how smaller sources should be subject to permitting. This section then describes key implementation issues including the approach to state adoption. After describing our plans for follow-up on title V fee programs, the section concludes by describing permit streamlining techniques; guidance on BACT for the GHG sources that are affected under the first two steps of the Tailoring Rule phase-in; requests for exemptions; and transitional issues, including grandfathering. Finally, section VI describes the expected impacts that will result from the phase-in approach (*i.e.*, the narrower application of PSD and title V requirements during the phase-in period) and sections VII and VIII address administrative requirements.

III. Background

A. What are GHGs and their sources?

Greenhouse gases trap the Earth’s heat that would otherwise escape from the atmosphere into space, and form the

⁵ The term “greenhouse gases” is commonly used to refer generally to gases that have heat-trapping properties. However, in this notice, unless noted otherwise, we use it to refer to specifically to the pollutant regulated in the LDVR.

⁶ The relevant thresholds are 100 tpy for title V, and 250 tpy for PSD, except for 28 categories listed in EPA regulations for which the PSD threshold is 100 tpy.

greenhouse effect that helps keep the Earth warm enough for life. Greenhouse gases are naturally present in the atmosphere and are also emitted by human activities. Human activities are intensifying the naturally occurring greenhouse effect by increasing the amount of GHGs in the atmosphere, which is changing the climate in a way that endangers human health, society, and the natural environment.

Some GHGs, such as CO₂, are emitted to the atmosphere through natural processes as well as human activities. Other gases, such as fluorinated gases, are created and emitted solely through human activities. As previously noted, the well-mixed GHGs of concern directly emitted by human activities include CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. These six GHGs will, for the purposes of this final rule, be referred to collectively as “the six well-mixed GHGs,” or, simply, GHGs, and together constitute the “air pollutant” upon which the GHG thresholds in this action are based. These six gases remain in the atmosphere for decades to centuries where they become well-mixed globally in the atmosphere. When they are emitted more quickly than natural processes can remove them from the atmosphere, their concentrations increase, thus increasing the greenhouse effect. The heating effect caused by the human-induced buildup of GHGs in the atmosphere is very likely the cause of most of the observed global warming over the last 50 years. A detailed explanation of greenhouse gases, climate change and its impact on health, society, and the environment is included in EPA’s technical support document (TSD) for the endangerment finding final rule (Docket ID No. EPA–HQ–OAR–2009–0472–11292).

In the United States, the combustion of fossil fuels (*e.g.*, coal, oil, gas) is the largest source of CO₂ emissions and accounts for 80 percent of the total GHG emissions. Anthropogenic CO₂ emissions released from a variety of sources, including through the use of fossil fuel combustion and cement production from geologically stored carbon (*e.g.*, coal, oil, and natural gas) that is hundreds of millions of years old, as well as anthropogenic CO₂ emissions from land-use changes such as deforestation, perturb the atmospheric concentration of CO₂ and the distribution of carbon within different reservoirs readjusts. More than half of the energy related emissions come from large stationary sources such as power plants, while about a third comes from transportation. Of the six well-mixed GHGs, four (CO₂, CH₄, N₂O, and HFCs) are emitted by motor vehicles. In the

United States industrial processes (such as the production of cement, steel, and aluminum), agriculture, forestry, other land use, and waste management are also important sources of GHGs.

Different GHGs have different heat-trapping capacities. The concept of GWP was developed to compare the heat-trapping capacity and atmospheric lifetime of one GHG to another. The definition of a GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO₂ over a specified time period. When quantities of the different GHGs are multiplied by their GWPs, the different GHGs can be summed and compared on a CO₂e basis. For example, CH₄ has a GWP of 21, meaning each ton of CH₄ emissions would have 21 times as much impact on global warming over a 100-year time horizon as 1 ton of CO₂ emissions. Thus, on the basis of heat-trapping capability, 1 ton of CH₄ would equal 21 tons of CO₂e. The GWPs of the non-CO₂ GHGs range from 21 (for CH₄) up to 23,900 (for SF₆). Aggregating all GHGs on a CO₂e basis at the source level allows a facility to evaluate its total GHG emissions contribution based on a single metric.

B. Endangerment Finding and the LDVR

1. Endangerment Finding

On April 2, 2007, the U.S. Supreme Court found that GHGs are air pollutants under CAA section 302(g). *Massachusetts v. EPA*, 549 U.S. 497 (2007). As a result, the Supreme Court found that EPA was required to determine, under CAA section 202(a), whether (1) GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or (2) the science is too uncertain to make a reasoned decision. After issuing a proposal and receiving comment, on December 7, 2009, the Administrator signed two distinct findings regarding GHGs under CAA section 202(a):

- *Endangerment Finding:* The Administrator found that the current and projected atmospheric concentrations of the mix of six long-lived and directly emitted GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ (referred to as “well-mixed greenhouse gases” in the endangerment finding)—are reasonably anticipated to endanger the public health and welfare of current and future generations.

- *Cause or Contribute Finding:* The Administrator found that the emissions of the single air pollutant defined as the aggregate group of six well-mixed greenhouse gases from new motor

vehicles and new motor vehicle engines contributes to the GHG air pollution that threatens public health and welfare.

These findings, which were published December 15, 2009 (74 FR 66496), do not themselves impose any requirements on industry or other entities. However, they were a prerequisite to finalizing the GHG standards for light-duty vehicles, described next.

2. Light-Duty Vehicle Rule

The LDVR, 75 FR 25324 (May 7, 2010), is a joint rule between EPA and the Department of Transportation’s National Highway Traffic Safety Administration (NHTSA) that establishes a national program consisting of new standards for light-duty vehicles that will reduce GHG emissions and improve fuel economy. EPA finalized the national GHG emissions standards under the Act, and NHTSA finalized Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act, as amended. The new standards apply to new passenger cars, light-duty trucks, and medium-duty passenger vehicles, starting with model year 2012. The EPA GHG standards are projected to result in an estimated combined average emissions level of 250 grams of CO₂ per mile for model year 2016 vehicles. The standards begin with the 2012 model year, with standards increasing in stringency through model year 2016. The standards are a fleet average for each manufacturer, based on a footprint attribute curve, meaning that the actual target for a vehicle will vary depending on the size of the vehicle. Under the footprint-based standards, each manufacturer will have a GHG standard unique to its fleet, depending on the footprints of the vehicle models produced by that manufacturer. A manufacturer will have separate footprint-based standards for cars and for trucks.

The endangerment and contribution findings described previously require EPA to issue standards under section 202(a) “applicable to emission” of the air pollutant that EPA found causes or contributes to the air pollution that endangers public health and welfare. The final emissions standards satisfy this requirement for GHGs from light-duty vehicles. Under section 202(a), the Administrator has significant discretion in how to structure the standards that apply to the emission of the air pollutant at issue here, the aggregate group of six GHGs. EPA has the discretion under section 202(a) to adopt separate standards for each gas, a single

composite standard covering various gases, or any combination of these. In the LDVR, EPA finalized separate standards for N₂O and CH₄, and a CO₂ standard that provides for credits based on reductions of HFCs, as the appropriate way to issue standards applicable to emission of the single air pollutant, the aggregate group of six GHGs. EPA did not set any standards for PFCs or SF₆, as they are not emitted by motor vehicles.

C. What are the general requirements of the PSD program?

1. Overview of the PSD Program

The PSD program is a preconstruction review and permitting program applicable to new major stationary sources and major modifications at existing major stationary sources. The PSD program applies in areas that are designated "attainment" or "unclassifiable" for a National Ambient Air Quality Standard (NAAQS). The PSD program is contained in part C of title I of the CAA. The "nonattainment new source review (NSR)" program applies in areas not in attainment of a NAAQS or in the Ozone Transport Region and is implemented under the requirements of part D of title I of the CAA. Collectively, we commonly refer to these two programs as the major NSR program. The governing EPA rules are contained in 40 CFR 51.165, 51.166, 52.21, 52.24, and part 51, Appendices S and W. There is no NAAQS for CO₂ or any of the other well-mixed GHGs, nor has EPA proposed any such NAAQS; therefore, unless and until we take further such action, we do not anticipate that the nonattainment NSR program will apply to GHGs.

The applicability of PSD to a particular source must be determined in advance of construction or modification and is pollutant-specific. The primary criterion in determining PSD applicability for a proposed source is whether the source is a "major emitting facility," based on its predicted potential emissions of regulated pollutants, within the meaning of CAA section 169(1) and either constructs or undertakes a modification. EPA has implemented these requirements in its regulations, which use somewhat different terminology for determining PSD applicability, which is whether the source is a "major stationary source" or whether the proposed project is a "major modification."

a. Major Stationary Source

Under PSD, a "major stationary source" is any source belonging to a specified list of 28 source categories

which emits or has the potential to emit 100 tpy or more of any pollutant subject to regulation under the CAA, or any other source type which emits or has the potential to emit such pollutants in amounts equal to or greater than 250 tpy. We refer to these levels as the 100/250-tpy thresholds. A new source with a potential to emit (PTE) at or above the applicable "major stationary source threshold" is subject to major source NSR. These limits originate from section 169 of the CAA, which applies PSD to any "major emitting facility" and defines the term to include any source that emits or has a PTE of 100 or 250 tpy, depending on the source category. Note that the major source definition incorporates the phrase "subject to regulation," which, as described later, will begin to include GHGs on January 2, 2011, under our interpretation of that phrase discussed in the recent Interpretive Memo notice. 75 FR 17004, April 2, 2010.

b. Major Modifications

PSD also applies to existing sources that undertake a "major modification," which occurs: (1) When there is a physical change in, or change in the method of operation of, a "major stationary source;" (2) the change results in a "significant" emission increase of a pollutant subject to regulation (equal to or above the significance level that EPA has set for the pollutant in 40 CFR 52.21(b)(23)); and (3) there is a "significant net emissions increase" of a pollutant subject to regulation that is equal to or above the significance level (defined in 40 CFR 52.21(b)(23)). Significance levels, which EPA has promulgated for criteria pollutants and certain other pollutants, represent a *de minimis* contribution to air quality problems. When EPA has not set a significance level for a regulated NSR pollutant, PSD applies to an increase of the pollutant in any amount (that is, in effect, the significance level is treated as zero).

2. General Requirements for PSD

This section provides a very brief summary of the main requirements of the PSD program. One principal requirement is that a new major source or major modification must apply BACT, which is determined on a case-by-case basis taking into account, among other factors, the cost effectiveness of the control and energy and environmental impacts. EPA has developed a "top-down" approach for BACT review, which involves a decision process that includes identification of all available control technologies, elimination of technically

infeasible options, ranking of remaining options by control and cost effectiveness, and then selection of BACT. Under PSD, once a source is determined to be major for any regulated NSR pollutant, a BACT review is performed for each attainment pollutant that exceeds its PSD significance level as part of new construction or for modification projects at the source, where there is a significant increase and a significant net emissions increase of such pollutant.⁷

In addition to performing BACT, the source must analyze impacts on ambient air quality to assure that no violation of any NAAQS or PSD increments will result, and must analyze impacts on soil, vegetation, and visibility. In addition, sources or modifications that would impact Class I areas (e.g., national parks) may be subject to additional requirements to protect air quality related values (AQRVs) that have been identified for such areas. Under PSD, if a source's proposed project may impact a Class I area, the Federal Land Manager is notified and is responsible for evaluating a source's projected impact on the AQRVs and recommending either approval or disapproval of the source's permit application based on anticipated impacts. There are currently no NAAQS or PSD increments established for GHGs, and therefore these PSD requirements would not apply for GHGs, even when PSD is triggered for GHGs. However, if PSD is triggered for a GHG emissions source, all regulated NSR pollutants which the new source emits in significant amounts would be subject to PSD requirements. Therefore, if a facility triggers review for regulated NSR pollutants that are non-GHG pollutants for which there are established NAAQS or increments, the air quality, additional impacts, and Class I requirements would apply to those pollutants.

The permitting authority must provide notice of its preliminary decision on a source's application for a PSD permit, and must provide an opportunity for comment by the public, industry, and other interested persons. After considering and responding to comments, the permitting authority must issue a final determination on the construction permit. Usually NSR permits are issued by state or local air

⁷ We note that the PSD program has historically operated in this fashion for all pollutants—when new sources or modifications are "major," PSD applies to all pollutants that are emitted in significant quantities from the source or project. This rule does not alter that for sources or modifications that are major due to their GHG emissions.

pollution control agencies, which have their own permit programs approved by EPA in their State Implementation Plans (SIPs). In some cases, EPA has delegated its authority to issue PSD permits to the state or local agency. In other areas, EPA issues the permits under its own authority.

D. What are the general requirements of the title V operating permits program?

1. Overview of Title V

The operating permit requirements under title V are intended to improve sources' compliance with other CAA requirements. The title V program is implemented through regulations promulgated by EPA, 40 CFR part 70, for programs implemented by state and local agencies and tribes, and 40 CFR part 71, for programs generally implemented by EPA.

In summary, the title V program requires major sources (defined and interpreted by EPA to include sources that emit or have a PTE of 100 tpy of any pollutant subject to regulation) and certain other sources to apply for operating permits. Under EPA's long-standing interpretation, a pollutant, such as a GHG, is "subject to regulation" when it is subject to a CAA requirement establishing actual control of emissions. Title V generally does not add new pollution control requirements, but it does require that each permit contain all pollution control requirements or "applicable requirements" required by the CAA (e.g., New Source Performance Standard (NSPS), and SIP requirements, including PSD), and it requires that certain procedural requirements be followed, especially with respect to compliance with these requirements. "Applicable requirements" for title V purposes include stationary source requirements, but do not include mobile source requirements. Other procedural requirements include providing review of permits by EPA, states, and the public, and requiring permit holders to track, report, and annually certify their compliance status with respect to their permit requirements.

2. Title V Permit Requirements

This section provides a brief summary of the requirements of the title V program that are most relevant to this action. A source generally must apply for a title V permit within 1 year of first becoming subject to permitting—for new sources, this is usually within 1 year of commencing operation. The application must include, among other things, identifying information, a description of emissions and other information necessary to determine

applicability of requirements and information concerning compliance with those requirements. The permitting authority uses this information to develop the source's operating permit.

Title V permits generally contain the following elements: (1) Emissions limitations and standards to assure compliance with all applicable requirements; (2) monitoring, recordkeeping, and reporting requirements, including submittal of a semiannual monitoring report and prompt reporting of deviations from permit terms; (3) fee payment; and (4) an annual certification of certification by a responsible official. The detailed requirements are set forth at 40 CFR 70.6.

In addition to the permit content requirements, there are procedural requirements that must be followed in issuing title V permits, including (1) Application completeness determination; (2) public notice and a 30-day public comment period, including an opportunity for a public hearing, on draft permits; (3) EPA and affected state review; and (4) a statement of the legal and factual basis of the draft permit. The permitting authority must take final action (issue or deny) on the permit applications within 18 months of receipt. EPA also has 45 days from receipt of a proposed permit to object to its issuance, and citizens have 60 days after that to petition EPA to object to a permit. Permits may also need to be revised or reopened if new requirements come into effect during the permit terms or if the source makes changes that conflict with, or necessitate changes to, the current permit. Permit revisions and re-openings follow procedural requirements which vary depending on the nature of the necessary change to the permit.

E. The Interpretive Memo

On December 18, 2008, EPA issued a memorandum, "EPA's Interpretation of Regulations that Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program" (known as the "Johnson Memo" or the "PSD Interpretive Memo," and referred to in this preamble as the "Interpretive Memo") that set forth EPA's interpretation regarding which EPA and state actions, with respect to a previously unregulated pollutant, cause that pollutant to become "subject to regulation" under the Act. Whether a pollutant is "subject to regulation" is important for the purposes of determining whether it is covered under the federal PSD and title V permitting programs. The Interpretive Memo established that a pollutant is "subject to

regulation" only if it is subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant (referred to as the "actual control interpretation"). On February 17, 2009, EPA granted a petition for reconsideration on the Interpretive Memo, and announced its intent to conduct a rulemaking to allow for public comment on the issues raised in the memorandum and on related issues. EPA also clarified that the Interpretive Memo would remain in effect pending reconsideration.

On March 29, 2010, EPA signed a notice conveying its decision to continue applying (with one limited refinement) the Interpretive Memo's interpretation of "subject to regulation" ("Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs"). See 75 FR 17004. EPA concluded that the "actual control interpretation" is the most appropriate interpretation to apply given the policy implications. However, we refined our interpretation in one respect: we established that PSD permitting requirements apply to a newly regulated pollutant at the time a regulatory requirement to control emissions of that pollutant "takes effect" (rather than upon promulgation or the legal effective date of the regulation containing such a requirement). In addition, based on the anticipated promulgation of the LDVR, we stated that the GHG requirements of the vehicle rule would take effect on January 2, 2011, because that is the earliest date that a 2012 model year vehicle may be introduced into commerce. In other words, the compliance obligation under the LDVR does not occur until a manufacturer may introduce into commerce vehicles that are required to comply with GHG standards, which will begin with model year 2012 and will not occur before January 2, 2011. We also reiterated EPA's interpretation that the 100 tpy major source threshold for title V is triggered only by pollutants "subject to regulation" under the Act, and we defined and applied that term for title V purposes in the same way that we did for PSD purposes. That is, we stated that a pollutant is "subject to regulation" if it is subject to a CAA requirement establishing "actual control of emissions;" that a pollutant is considered "subject to regulation" for title V purposes when such a requirement "takes effect"; and, based on the anticipated promulgation of the LDVR, that the GHG requirements of the

vehicle rule would take effect on January 2, 2011.

On April 1, 2010, we finalized the LDVR as anticipated, confirming that manufacturer certification can occur no earlier than January 2, 2011. Thus, under the terms of the final notice for the Interpretive Memo, GHGs become subject to regulation on that date, and PSD and title V program requirements will also begin to apply upon that date.

IV. Summary of Final Actions

This section describes the specific actions we are taking in this final rule. It describes the overall tailoring approach for NSR and title V applicability, the steps we are taking to put it into place, and future actions that we commit to take. The next section, V, provides the legal and policy rationale for these actions. In that section, we provide a description of our rationale and response to comments for each action, presented in the same order as we describe the actions here.

A. How do you define the GHG pollutant for PSD and title V purposes?

1. GHG Pollutant Defined as the Sum-of-Six Well-Mixed GHGs

We are identifying the air pollutant for purposes of PSD and title V applicability to be the pollutant subject to regulation, which is the air pollutant for GHGs identified in EPA's LDVR, as well as EPA's endangerment and contribution findings.⁸ In the LDVR, EPA set emissions standards under section 202(a) that were "applicable to emission" of a single air pollutant defined as the aggregate sum of six GHGs. The six GHGs, which are well-mixed gases in the atmosphere, are CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. Earlier, EPA made the contribution finding for this single air pollutant.

Furthermore, as proposed, we are using an emissions threshold that allows all six constituent gases to be evaluated using a common metric—CO₂e. Thus, to determine applicability, a source's GHG emissions are calculated on a CO₂e basis by multiplying the mass emissions of any of the six GHGs that the source emits by that gas's GWP and then summing the CO₂e for each GHG emitted by the source. This sum, expressed in terms of tpy CO₂e, is then compared to the applicable CO₂e-based permitting threshold to determine whether the source is subject to PSD and title V requirements.

In addition, because we are implementing this phase-in through the term "subject to regulation," the

regulatory language is structured such that the statutory mass-based thresholds (*i.e.*, for PSD, 100/250 tpy for new construction and zero tpy for modifications at a major stationary source, and for title V, 100 tpy) continue to apply. As a result, stationary source apply and stationary sources or modifications that do not meet these thresholds are not subject to permitting requirements. While technically evaluation of the mass-based thresholds is the second step in the applicability analysis, from a practical standpoint most sources are likely to treat this as an initial screen, so that if they would not trigger PSD or title V on a mass basis, they would not proceed to evaluate emissions on a CO₂e basis. We have treated evaluation of mass-based thresholds as the initial step in our descriptions. As applicable, a source would evaluate these mass-based thresholds by summing each of the six GHGs it emits on a mass basis (*i.e.*, before applying GWP). We expect that it will be very rare for a new stationary source or modification to trigger permitting based on CO₂e and not also trigger based on mass alone.

Determining permit program applicability for the GHG "air pollutant" by using the sum-of-six GHGs is based on EPA's interpretation that the PSD and title V requirements apply to each "air pollutant" that is "subject to regulation" under another provision of the CAA. As discussed previously, the final LDVR for GHGs makes it clear that the emissions standards EPA adopted are standards applicable to emission of the single air pollutant defined as the aggregate mix of these six well-mixed GHGs. *See* LDVR, May 7, 2010, 75 FR 25398–99, section III.A.2.c, and 40 CFR 86.1818–12.⁹ For reasons explained in more detail in section V, we have determined it is legally required, and preferable from a policy standpoint, for EPA to use the same definition of the air pollutant for permitting purposes as that used in the rule that establishes the control requirements for the pollutant. We also believe there are implementation advantages for applying PSD and title V in this way. Thus, this rule establishes that a stationary source will use the group of six constituent gases for permitting applicability, rather than treating each gas individually. Similarly, you will include all six constituent gases because that is how the air pollutant is defined, even though motor vehicles only emit four of the six.

2. What GWP values should be used for calculating CO₂e?

We are requiring that wherever you perform an emissions calculations involving CO₂e for the purposes of determining the applicability of PSD or title V requirements, you use the GWP values codified in the EPA's mandatory GHG reporting rule.¹⁰ This approach will assure consistency between the values required for calculations under the reporting rule and for PSD or title V. In addition, because any changes to Table A–1 of the mandatory GHG reporting rule regulatory text must go through a rulemaking, this approach will assure that the values used for the permitting programs will reflect the latest values adopted for usage by EPA after notice and comment.

B. When will PSD and title V applicability begin for GHGs and emission sources?

Overview

In this action, we establish the first two phases of our phase-in approach, which we refer to as Steps 1 and 2. We also commit to a subsequent rulemaking in which we will propose or solicit comment on establishing a further phase-in, that is, a Step 3, that would apply PSD and title V to additional sources, effective July 1, 2013, and on which we commit to take final action, as supported by the record,¹¹ by no later than July 1, 2012.

We also commit to undertaking an assessment of sources' and permitting authorities' progress in implementing PSD and title V for GHG sources, and to complete this assessment by 2015. We further commit to completing another round of rulemaking addressing smaller sources by April 30, 2016. Our action in that rulemaking would address permitting requirements for smaller sources, taking into account the remaining problems concerning costs to sources and burdens to permitting authorities. Finally, we determine in this action that we will apply PSD or title V requirements to sources that emit GHGs, or that conduct modifications that result in increases in emissions of GHGs, in amounts of less than 50,000 tpy CO₂e any earlier than when we take the required further action to address smaller sources by April 30, 2016.

¹⁰ Table A–1 to subpart A of 40 CFR part 98—Global Warming Potentials, 74 FR 56395.

¹¹ Although we commit to propose or solicit comment on lower thresholds and to take final action on that proposal by July 1, 2012, we cannot, at present, commit to promulgate lower thresholds. It will not be until the Step 3 rulemaking itself that we will gather and analyze data and receive comments that determine whether we have basis for promulgating lower thresholds.

⁸ *See* 74 FR 66496, 66499, 66536–7, December 15, 2009.

⁹ 40 CFR 86.1818–12(a).

Through this process, we will implement the phase-in approach by applying PSD and title V at threshold levels that are as close to the statutory levels as possible, and do so as quickly as possible, at least to a certain point. The level and timing of the thresholds that we promulgate in future actions will be based on our assessment of the resulting costs to sources and burdens to permitting authorities, and that, in turn, will depend on such variables as our progress in developing streamlining approaches and on permitting authorities' progress in developing permitting expertise and acquiring more resources. At this time, we cannot foresee exactly when or in what manner those developments will occur. Therefore, we cannot promulgate more components of the tailoring approach beyond what we promulgate in this action. We can say only that we may continue the phase-in process with further rulemaking after 2016. Alternatively, we may make a definitive determination in one of the future rulemaking actions that, under the "absurd results" doctrine, PSD or title V applies only to certain GHG sources, and does not apply to the remaining GHG sources, and with that rulemaking, bring this tailoring process to a close.

1. What are the Step 1 thresholds, timing, and calculation methodology?

a. PSD Permitting

Step 1 of the Tailoring Rule phase-in will begin on January 2, 2011. With respect to the PSD program, GHG sources will become subject to PSD for their GHG emissions if they undergo PSD permitting anyway, either for new construction or for modification projects, based on emissions of non-GHG pollutants, in which case they will be subject to the PSD requirements for GHG if they increase GHG emissions by 75,000 tpy CO₂e or more. Under this step, only these sources, which we refer to as "anyway" PSD sources, will become subject to PSD; no sources will become major sources for PSD purposes or be treated as undertaking modifications that trigger PSD based solely on their GHG emissions. As a result, no additional PSD permitting actions will be necessary solely due to GHG emissions. However, existing or newly-constructed sources that are determined to be major sources based on non-GHG emissions are required to conduct a BACT review for their GHG emissions (from new construction) or emissions increases (from modifications), if they are subject to PSD due to their non-GHG emissions from construction or modification

actions and each of the following conditions is met:

- (1) The GHG emissions (or net emissions increase) due to the new construction (or modification) project, calculated as the sum of the six well-mixed GHGs on a mass basis (no GWPs applied) exceed a value of 0 tpy; and
- (2) The GHG emissions (or net emissions increase) due to the new construction (or modification) project, calculated as the sum of the six well-mixed GHGs on a CO₂e basis (GWPs applied) equal or exceed a value of 75,000 tpy CO₂e.

The purpose of the first condition is to determine whether the GHG emissions or net emissions increase has resulted in an "increase in the amount" of an air pollutant as required by the Act. Because EPA has not defined a mass-based regulatory significance level for GHGs, that level, in effect, is treated as zero. See 40 CFR 52.21(b)(23)(ii) and 51.166(b)(23)(ii). In practice, this means any amount of new emissions or an emission increase will exceed the mass-based limit. We are not, at this time, establishing a significance level based on mass emissions, and instead we are establishing one based on CO₂e that addresses permitting burdens. The zero mass-based amount applies, but only as an initial screen to exclude sources or changes that have no mass increase of GHGs.

b. Title V Permitting

Under Step 1, only sources required to have title V permits for non-GHG pollutants (*i.e.*, "anyway" title V sources) will be required to address GHGs as part of their title V permitting. That is, no sources will become major for title V based solely on their GHG emissions. Note further, however, that the 75,000 tpy CO₂e limit does not apply to title V, so that anyway title V sources must apply any title V requirements to their GHG emissions. Sources with title V permits must address GHG requirements when they apply for, renew, or revise their permits. These requirements will include any GHG applicable requirements (*e.g.*, GHG BACT requirements from a PSD process) and associated monitoring, record-keeping and reporting. When a permit application is otherwise required, they will also need to identify GHG emissions and other information in that application to the extent required under 40 CFR 70.5(c) and 71.5(c), including information necessary to determine applicable requirements.¹²

¹² EPA notes, however, that many sources subject to title V under Steps 1 and 2 will also be subject to the GHG mandatory reporting rule. For these

2. What are the Step 2 thresholds, timing, and calculation methodology?

a. PSD Permitting

Step 2 will begin July 1, 2011. Under Step 2, anyway PSD sources—that is, sources already subject to PSD based on non-GHG and covered under Step 1 previously—will remain subject to PSD. In addition, sources with the potential to emit 100,000 tpy CO₂e or more of GHG will be considered major sources for PSD permitting purposes (provided that they also emit GHGs or some other regulated NSR pollutant above the 100/250 tpy (mass based) statutory thresholds. Additionally, any physical change or change in the method of operation at a major source (including one that is only major due to GHGs) resulting in a net GHG emissions increase of 75,000 tpy CO₂e or more will be subject to PSD review and requirements with respect to GHGs (provided that it also results in an increase of GHG emissions on a mass basis).

Specifically, for purposes of determining whether a GHG emission source, resulting from either new construction or a physical or operational change at an existing source, is considered a major source under PSD, both of the following conditions must be met:

(1) The GHG emission source, which is not major for another pollutant, emits or has the potential to emit GHG in amounts that equal or exceed the following, calculated as the sum-of-six well-mixed GHGs on a mass basis (no GWPs applied):

- 100 tpy for sources in any of the 28 major emitting facility source categories listed under PSD, or
- 250 tpy for any other stationary source.

(2) The GHG emission source emits or has the potential to emit GHGs in amounts that equal or exceed 100,000 tpy CO₂e basis.

For determining whether a modification project at a major stationary source is subject to PSD review, both of the following conditions must be met:

(1) The net GHG emissions increase resulting from the project, calculated as the sum-of-six well-mixed GHGs on a mass basis (no GWPs applied) equals or exceeds 0 tpy.

(2) The net GHG emissions increase resulting from the project, calculated as the sum-of-six well-mixed GHGs on a

sources, the emissions description requirements in the title V regulations will generally be satisfied by referencing information provided under the reporting rule.

CO₂e basis (GWPs applied) equals or exceeds 75,000 tpy CO₂e.

The purpose of the first condition in both of these determinations is to confirm whether the GHG emissions or emissions increase have exceeded, on a mass-basis, the statutory major source thresholds (where the source is not otherwise major) and mass-based statutory significance level for GHGs, which, as noted previously, is 0 tpy. See 40 CFR 52.21(b)(23)(ii) and 51.166(b)(23)(ii).

As an example of how the mass-based test would apply, consider a modification project that results in a 5 tpy increase of GHG emissions on a mass basis, associated with a high-GWP GHG gas (for example, SF₆, with a GWP value of 23,900), but also results in a 100 tpy reduction in CO₂ emissions (assume no other contemporaneous increases or decreases of GHG). In this example, there would be a net decrease of GHG emissions on a mass basis (5 tpy – 100 tpy = –95 tpy). Because there is no mass-based increase of GHG, this project does not trigger PSD, despite the fact that the net GWP-adjusted emissions increase of SF₆ in this example would equal 119,500 tpy of CO₂e and the project would thus exceed 75,000 tpy CO₂e.

b. Title V Permitting

Under Step 2, “anyway” title V sources—that is, sources already subject to title V based on non-GHGs and that are covered under Step 1 previously—will continue to be subject to title V. In addition, GHG emission sources that equal or exceed the 100,000 tpy CO₂e threshold will be required to obtain a title V permit if they do not already have one. It is important to note that the requirement to obtain a title V permit will not, by itself, result in the triggering of additional substantive requirements for control of GHG. Rather, these new title V permits will simply incorporate whatever applicable CAA requirements, if any, apply to the source being permitted. Both of the following conditions need to be met in order for title V to apply under Step 2 to a GHG emission source:

(1) An existing or newly constructed source emits or has the potential to emit GHGs in amounts that equal or exceed 100 tpy calculated as the sum of the six well-mixed GHGs on a mass basis (no GWPs applied).

(2) An existing or newly constructed source emits or has the potential to emit GHGs in amounts that equal or exceed 100,000 tpy calculated as the sum of the six well-mixed GHGs on a CO₂e basis (GWPs applied).

3. What about Step 3?

In this rule, EPA establishes an enforceable commitment to complete another rulemaking no later than July 1, 2012, in which we will propose or solicit comment on a Step 3 of the phase-in and may also consider other approaches that may result in the permanent exclusion of a category of sources from PSD or title V requirements, under the *Chevron* framework, taking account of the “absurd results” doctrine.

Consistent with our phase-in approach, it is important for us to consider whether, at some point during the implementation of Step 2, it will become possible to administer GHG permitting programs for additional sources. For example, if EPA is able to promulgate measures that streamline programs to at least some extent, if permitting authorities increase their resources, or if implementation experience and more seasoned staff results in more effective use of scarce permitting resources, then we expect that we will be able to phase in the application of PSD and title V to more sources by establishing Step 3. We do not have enough information now to establish a final Step 3, particularly because there will be significant transition occurring in the GHG permitting programs during Steps 1 and 2. However, we believe that it will be possible to develop a record on which to base Step 3 sometime soon after we begin to implement Step 2.

Therefore, we plan to propose a rule in which we solicit comment on or propose lower thresholds for PSD and title V applicability, and we establish an enforceable commitment to finalize a rule in which we address those matters by July 1, 2012. In order to provide a year for permitting authorities and sources to prepare for any additional GHG permitting action in Step 3, we will establish that Step 3 would take effect on July 1, 2013. We also commit to explore, between now and the Step 3 proposal, a wide range of streamlining options. In the proposal, we will take comment on streamlining approaches we think may be viable (except to the extent we will have already issued guidance documents concerning streamlining approaches), and we will address those options in the final rule.

In addition, as part of the Step 3 action, we may solicit comment on a permanent exclusion of certain sources from PSD, title V or both, based on an “absurd results” rationale. For example, we may make a final determination that under the “absurd results” doctrine, PSD and/or title V do not apply to a set of

GHG sources that, although above the statutory thresholds for those programs, are too small and relatively inconsequential in terms of GHG contribution. Another type of such exclusion for the title V program could be for sources that would otherwise be required to obtain an “empty permit,” that is, for example, one that would not contain any applicable requirements because there are none that apply to the source. If we promulgate a permanent exclusion, we may conclude that by that time, we will have brought into the PSD and title V programs the full set of sources that would be consistent with congressional intent (or, if congressional intent on that point is unclear, with a reasonable policy consistent with statutory requirements) and, under those circumstances, we would find that such a rule brings the tailoring process to a close. The application of the “absurd results” rationale for a permanent exclusion is discussed in more detail in section V.B, later in this preamble.

4. What about the proposed 6-year exclusion for smaller sources?

The tailoring proposal contemplated at least a 6-year exclusion from permitting for small sources. This proposed exclusion was based on the overwhelming numbers of permitting actions at small sources and the need for time for permitting authorities to secure resources, hire and train staff, and gain experience with GHG permitting for new types of sources and technologies. It was also based on the time needed for EPA to develop, and for states to adopt, streamlining measures to reduce the permitting burden (e.g., concerning PTE, presumptive BACT, or general permits). We therefore proposed such an exclusion, and proposed that it would last 6 years—5 years to complete a required study evaluating permitting burden and assessing the effect of streamlining measures or techniques in reducing this burden, plus an additional year to complete a final rulemaking that would phase in additional sources as appropriate based on the study.

We are finalizing the 6-year exclusion, and for reasons described later, are establishing that in no event will sources below 50,000 tpy CO₂e be subject to PSD or title V permitting during the 6-year period, nor will modifications be subject to PSD unless they increase emissions by 50,000 tpy CO₂e or more. The exclusion will last until we take the action described later to address smaller sources, which is required by April 30, 2016. The exclusion provides certainty that, before this date, EPA will not act to cover

sources and modifications below these thresholds, including during the required Step 3 rulemaking that will occur in 2012. In effect, this means that Step 3 will establish a major source threshold and significance level no lower than 50,000 tpy CO₂e. This does not necessarily mean we will cover sources below this level on April 30, 2016. It simply means that the provision we are adopting would assure that EPA does not cover such sources any sooner than that.

5. When and how will EPA take further action on smaller sources?

As we proposed, we are establishing an enforceable commitment to act within 5 years to complete a study projecting the administrative burdens that remain for small sources after permitting authorities have had time to secure resources, hire and train staff, and gain experience with GHG permitting for new types of sources and technologies, and after EPA has had time to develop (and states have had time to adopt) streamlining measures to reduce the permitting burden for such sources. We will use the results of this study to serve as the basis for an additional rulemaking that would take further action to address small sources. Similar to the enforceable commitment to act on Step 3, we are making an enforceable commitment to complete this rulemaking by April 30, 2016.

We cannot predict at this time what form that final action will take. It could function as a Step 4, bringing in additional sources based on, for example, streamlining actions, increased permitting authority resources, and experienced and more efficient permitting staff; and it could further indicate that we intend to follow-up with a Step 5 to bring in more sources. Alternatively, it could also function as a final step excluding certain sources permanently based on our application of the *Chevron* framework, taking account of the “absurd results” doctrine, and subjecting the remaining sources to permitting. However, whatever final action we take would explain any necessary changes to the Step 3 thresholds and would supersede the 6-year exclusion for sources and modifications below 50,000 tpy CO₂e.

C. How do state, local and tribal area programs adopt the final GHG applicability thresholds?

We are finalizing our proposed approach to change the definition of “major stationary source” in the PSD implementing regulations, and the “major source” definition in the title V

implementing regulations to tailor the application of these permitting programs to GHG emissions. We are also finalizing a significance level for GHG emissions for purposes of defining a major modification under the PSD program, and add an exclusion from PSD and title V permitting for GHG emissions, until we complete a rulemaking required by April 30, 2016, for any sources that are not already subject to PSD and title V permitting and that emit less than 50,000 tpy of CO₂e.

As explained earlier, we are adopting thresholds that phase in the applicability of GHG permitting over a specified time period. In adopting regulatory changes to implement these thresholds, we follow an approach that is substantively the same as the approach proposed, but takes a different form for purposes of revisions to our PSD and title V regulations. Specifically, in this final rule, for our regulations, in conjunction with the definitions of “major stationary source” and “major modification” (for PSD) and “major source” (for title V), we are adopting a definition of the term “subject to regulation.” Moreover, we are defining this term so that GHG emissions from sources above the threshold are treated as subject to regulation, and therefore the sources that emit them are subject to PSD and title V. We are not finalizing the approach we proposed, which was to revise the numerical thresholds in the definitions so that GHG sources would have a higher threshold. Although we are defining the term “subject to regulation,” we recognize that from a substantive standpoint, our tailoring approach entails interpreting the definitions of “major emitting facility,” “major modification,” and “major source” to phase in the applicability of PSD and title V, as applicable, to GHG sources, and it makes no difference whether we interpret those definitions through a definition of the term “subject to regulation,” revising the numerical thresholds, or revising other terms in those definitions.

We are adopting definitions of the term “subject to regulation” to implement the tailoring approach because that will facilitate rapid implementation of the final rules by states. Under this approach, states may not need to undertake a regulatory or legislative action before implementing the final rule. These states would be able to establish their interpretations of the term “subject to regulation” used in existing state rules before January 2, 2011, which is the date that the LDVR and permitting requirements would take

effect, and thereby exempt sources below the threshold from PSD and title V as a matter of both federal and state law. We are also codifying in this definition EPA interpretations discussed in our recent action “Reconsideration of Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs” (75 FR 17704) to provide a complete picture of the meaning of this phrase as it applies to all air pollutants.

Because we are finalizing the rule in a manner that will allow most states to rapidly implement the final rule, and because our recent action on the Interpretive Memo allowed for a longer transition time than we anticipated at proposal, we are delaying final action on our proposal to issue limited approvals for SIP-approved PSD programs and part 70 operating permit programs.¹³ Instead, we are requesting that states submit information to the appropriate EPA Regional Administrator by August 2, 2010 so that we may determine whether it is still necessary to finalize any of our proposed limited approvals for any SIP-approved PSD and part 70 title V state programs. In that letter, states should explain whether they will apply the meaning of the term “subject to regulation” established by EPA in this action in implementing both their PSD and part 70 title V permitting programs, and if so, whether the state intends to do so without undertaking a regulatory or legislative process. If a state must revise its statutes or regulations to implement this rule, we ask that it provide an estimate of the time to adopt final rules in its letter to the Regional Administrator. If a state chooses not to apply the approach reflected in this rule, the letter should address whether the state has alternative authority to implement the final rule’s tailoring approach or some other approach that is at least as stringent, but which also addresses the expected shortfalls in personnel and funding that would exist if the state carried out permitting at thresholds lower than those in the final rules. For any state that is unable or unwilling to apply the permitting thresholds in the final rules, and otherwise is unable to demonstrate adequate personnel and funding, or alternate authority to permit GHG emissions sources consistent with the final rules, EPA will move forward with finalizing a limited approval of the state’s permitting program. By the same token, if we do not receive a letter from

¹³ In the alternative, we also proposed to use our 110(k)(6) error correction authority to revise SIP-approved PSD programs.

a state in response to this request by August 2, 2010, we will be obliged to move forward with finalizing a narrowing of our approval of the existing SIP or title V program.

We also ask any state that currently lacks authority to issue PSD or title V permits to any GHG emissions sources to notify the EPA Regional Administrator by letter as to whether the state intends to undertake rulemaking to revise its rules consistent with these applicability thresholds. For any state that lacks the ability to issue PSD or title V permits for GHG emissions sources consistent with the final rule, we intend to undertake a separate action to call for revisions to these programs. We also intend to move quickly to impose a Federal Implementation Plan (FIP) for PSD through 40 CFR 52.21, and use our federal title V authority to ensure that GHG sources will be permitted consistent with the final rules. Our request for information from states is discussed further in section V.C.

D. How do you treat GHGs for purposes of title V permit fees?

We are not amending the title V regulations for fees at this time, including any of the provisions specifying the presumptive minimum fee. We are also not, at this time, calling for each state, local or tribal program to submit new fee adequacy demonstrations as a result of increased GHG permitting workload during Steps 1 and 2. However, as described in section VI.D the statutory and regulatory requirement to collect fees sufficient to cover all reasonable (direct and indirect) costs required to develop and administer title V programs still applies. Therefore, we are recommending that each program review its resource needs for GHG-emitting sources and determine if the existing fee approaches will be adequate. If those approaches will not be adequate, we suggest that state, local and tribal agencies should be proactive in raising fees to cover the direct and indirect costs of the program or develop other alternative approaches to meet the shortfall. We will closely monitor approved title V programs during implementation of the first two steps of the Tailoring Rule to ensure that the added workload from incorporating GHGs into the permit program does not result in fee shortfalls that imperil operating permit program implementation and enforcement. In developing alternative approaches, we note the value of approaches that do not require a per-ton fee for GHG and therefore do not require a GHG inventory to develop. Finally, we offer

to work with permitting authorities that request our assistance with developing fee approaches.

E. Other Actions and Issues

This section describes other actions we intend to take in the future related to GHG permitting in addition to the actions that we are promulgating with this final rule. This section also responds to commenters' suggestions that we undertake certain additional actions in this rule, which we decline to do.

1. Timing for Permit Streamlining Techniques

As described at proposal, we intend to develop a series of streamlining approaches as an integral part of our phase-in approach. The approaches we described at proposal included: (1) Defining PTE for various source categories, (2) establishing emission limits for various source categories that constitute presumptive BACT, (3) establishing procedures for use of general permits and permits-by-rule, (4) establishing procedures for electronic permitting, and (5) applying lean techniques to establish more efficient permitting processes. Taken as a whole, these techniques have the potential to obviate the applicability of PSD and title V requirements for some GHG-emitting sources; promote more efficient treatment of GHG-emitting sources that will already be subject to PSD and title V; and allow the expeditious expansion of PSD and title V applicability to more GHG-emitting sources while protecting those sources and the permitting authorities from undue expenses.

As a result, we fully intend to move forward expeditiously with developing streamlining approaches. However, for reasons discussed in section V.E, we do not expect to develop and implement any of these approaches before Step 2 begins. Moreover, we generally expect that each of the first three—which are the most far-reaching—will take several years to implement because we will need to undertake notice and comment rulemaking to develop them, and then the permitting authorities will need to adopt them through the appropriate state or local processes. We commit to explore a wide range of possible approaches before the Step 3 rulemaking, and, in that rulemaking, to propose those that we think may be viable once we have had time to gather and review key supporting data, and once the states and we have key implementation experience that can inform our thinking. Because the streamlining approaches generally carry uncertainty—as demonstrated by

comments we received raising legal and policy concerns, as discussed later, that we will have to address—we cannot commit with this action to adopt any streamlining actions in particular, nor to adopting them on any particular schedule. However, we intend to pursue streamlining options as expeditiously as possible, beginning immediately and proceeding throughout the phase-in period, and we encourage permitting authorities to do the same.

2. Guidance for BACT Determinations

Through this final rule we are not amending our regulations or issuing guidance on BACT for GHGs. As described in our proposal, we recognize the need to develop and issue technical and policy guidance for permitting of GHGs, and we plan to accomplish it through a separate effort that will involve stakeholder input. This effort is already underway; in addition to comments EPA received on the proposed Tailoring Rule related to GHG BACT guidance and information needs, EPA received a suite of recommendations from the Clean Air Act Advisory Committee (CAAAC) to which EPA is actively responding. This includes technical guidance and database tools that EPA anticipates issuing by June 2010, and policy guidance that will be issued by the end of 2010. Thus, this important information will be available to support permitting agencies in their BACT determinations at the time that the GHGs become a regulated NSR pollutant, once the LDVR takes effect in January 2011. EPA is confident that these measures will help support a smooth transition to permitting emissions of GHGs.

3. Requests for Higher Category-Specific Thresholds and Exemptions From Applicability

EPA has decided not to provide exemptions from applicability determinations (major source and major modification) under title V and PSD for certain GHG emission sources, emission activities, or types of emissions at this time. Commenters requested several applicability exemptions with respect to GHGs from, for example, agricultural sources, residential sources, small businesses, energy-intensive industrial processes (*e.g.*, aluminum, steel, cement, glass, and pulp and paper manufacturers), lime production, semiconductor production, poultry production, solid waste landfills, biomass combustion/biogenic emissions, fugitive emissions, and pollution control projects. For reasons explained in section V.E, we have

decided to address the need for tailoring through a uniform threshold-based approach, rather than through a collection of various specific exclusions.

4. Transitional Issues Including Requests for Grandfathering

For reasons explained in section V.E, EPA has determined that transitional issues for pending applications and permitted sources are adequately addressed by existing requirements and the amount of lead time provided before permitting requirements apply to GHGs under this rule and the March 29, 2010 final action regarding the Interpretive memo. This rule does not contain any additional exemptions or grandfathering provisions addressing the transition to PSD and title V permitting for GHGs.

We are not promulgating an exemption for PSD permit applications that are pending when Step 1 of the permitting phase-in begins for those sources that would otherwise need to obtain a PSD permit based on emissions of pollutants other than GHGs. Any PSD permits issued to such Step 1 sources on or after January 2, 2011 will need to address GHGs. This action makes no change to the position we expressed on this issue on April 2, 2010.

Final PSD permits issued before January 2, 2011 need not be reopened or amended to incorporate requirements for GHGs that take effect after the permit is issued. A source that is authorized to construct under a PSD permit but has not yet begun actual construction on January 2, 2011 may begin actual construction after that date without having to amend the previously-issued PSD permit to incorporate GHG requirements, provided the permit has not expired.

Sources that are not subject to PSD permitting requirements until Step 2 need not obtain a PSD permit addressing GHGs in order to continue any actual construction that begins before July 1, 2011, when such a source was not a major stationary source required to obtain a PSD permit. However, Step 2 sources that begin actual construction in Step 2 may do so only after obtaining a PSD permit.

The title V permitting regulations already include a robust set of provisions to address the incorporation of new applicable requirements and other transitional considerations. A title V source applying for the first time must submit its permit application within 12 months after the source becomes subject to the operating permit program or an earlier time at the discretion of the permitting authority. Where a source is required to obtain a PSD permit, the source must apply for a title V permit

or permit revision within 12 months of commencing operation or on or before such earlier date as the permitting authority may establish. Where additional applicable requirements become applicable to a source after it submits its permit application, but prior to release of a draft permit, the source is obligated to supplement its application. Permitting authorities may also ask for additional information during the processing of an application. In addition, where a source that already has a title V permit becomes subject to additional applicable requirements, the permitting authority is required to reopen the permit to add those applicable requirements if the permit term has 3 or more years remaining and the applicable requirements will be in effect prior to the date the permit is due to expire.

V. What Is the Legal and Policy Rationale for the Final Actions?

In this section, we describe the legal and policy rationale for our action, including our rationale for the following: (1) Our approach to calculating GHG emissions for PSD and title V applicability purposes, (2) our approach to establishing the thresholds and timing of PSD and title V applicability to GHG emissions sources; (3) how state, local, and tribal area programs adopt the final GHG applicability thresholds; (4) treatment of GHGs for title V permit fees; (5) future activities, including streamlining actions. We present the rationale description in the following five subsections, corresponding to the basic presentation of the approach in section IV.

A. Rationale for Our Approach to Calculating GHG Emissions for PSD and Title V Applicability Purposes

1. Grouping of GHGs Into a Single Pollutant

In this section, we explain our treatment of the air pollutant at issue for purposes of PSD and title V, such that sources that emit that pollutant in the requisite quantities become subject to PSD and/or title V requirements. We explain our rationale for treating the GHG air pollutant as a combined group of six GHGs instead of six separate air pollutants defined by each individual GHG, and our rationale for including all six of the GHGs in that group. We also define the GHG metric to use for comparison to the applicability thresholds.

We proposed to identify the air pollutant as the aggregate group of the six GHGs that comprise the GHG

pollutant, and to use a GHG metric for the applicability thresholds based on CO₂e. The summed CO₂e emissions would then be compared to the applicable permitting threshold to determine whether the source is subject to PSD and title V requirements. Historically, the PSD and title V regulatory provisions do not, in the first instance, define the “air pollutant” to which they apply, but rather rely for the definition of the pollutant on a cross-reference to the regulatory provision under another part of the Act that establishes the emission standards or limits for that pollutant that in turn causes the pollutant to be subject to regulation under PSD and title V permitting. As an example, the pollutant “total reduced sulfur” (TRS) is a pollutant comprised of the sum of multiple compounds that was originally defined under the NSPS, subpart BB, Standards of Performance for Kraft Pulp Mills, which then caused it to be subject to regulation under the PSD program. The actual compounds that define the pollutant TRS are identified in the NSPS. The PSD program regulations did not introduce its own independent definition of TRS, but instead relied on the definition as contained in the Kraft Pulp Mills NSPS.

However, at the time of our proposal, the endangerment and cause or contribute findings had not been completed and the LDVR for GHGs had not been finalized. Thus, there was no final agency action defining the “air pollutant” consisting of GHGs to be considered “subject to regulation.” Absent a definition of “greenhouse gases” under another regulatory provision that we could cross-reference, we proposed to define “greenhouse gases” for permitting purposes as “the single air pollutant that is comprised of the group of six GHGs, as proposed in the [CAA] section 202(a) endangerment and contribution findings.” 74 FR 55329, col. 1. The six well-mixed GHGs identified in the proposed contribution finding were: CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs.

In the proposal, we further recognized that the LDVR for GHGs, as it was proposed, would result in reductions of only four of the gases, not all six, because only four are emitted by vehicles. However, we concluded that if the LDVR were finalized as proposed, then the air pollutant for purposes of PSD and title V applicability would be a single air pollutant that is the aggregate mix of the group of six GHGs because—

[t]hese six GHGs as a class comprise the air pollutant that is the subject of the

endangerment finding and companion contribution finding and constitute the air pollutant that is regulated by the light-duty vehicle rule through measures that address the components of that air pollutant that are emitted from the mobile sources. Thus, although the CAA section 202(a) proposal establishes controls only with respect to four GHGs, as a legal matter, the proposal covers the entire set of GHGs that as a class are the single “air pollutant” in the proposed endangerment and contribution findings.

74 FR 55329 col. 1.

We also solicited comment on whether we should identify the GHG metric in a different way, such as addressing each GHG constituent compound individually or including (whether individually or as a group) only those four GHG constituent compounds for which reductions would occur through the emission standards or limits proposed in the LDVR.

A minority of the comments on our proposal addressed this issue. Some commenters supported combining the individual GHGs as one pollutant for purposes of determining permitting applicability, and stated that it is not uncommon for EPA to recognize “collective” air pollutants comprised of many individual compounds based upon shared threats to health and welfare, including such EPA-created group pollutants as sulfur oxides, nitrogen oxides, volatile organic compounds (VOCs), and particulate matter (PM).

On the other hand, a significant number of commenters also raised concerns about grouping the individual GHGs into one metric. Some of these commenters argued that grouping GHGs is not appropriate because GHGs are not like other air pollutants that are comprised of numerous substances of concern (*e.g.*, VOCs and PM), individual GHGs do not interact or combine to create a pollutant of concern, and EPA has not established a “GHG” NAAQS that supports the definition of the pollutant as a group. Some were concerned that regulating the GHGs as a group would increase the likelihood that a source will trigger permitting requirements, adding that this is unnecessary and would conflict with the “absurd results” and “administrative necessity” doctrines because it would lead to larger numbers of sources becoming subject to permitting. Some commenters opposing grouping suggested that we should explore regulating each of the GHG pollutants on an individual mass basis rather than collectively because in their view, it is reasonable and feasible to regulate and control emissions of each of the listed pollutants, other than CO₂, at the 100/

250 tpy thresholds, or less if deemed necessary, in accordance with the established mechanisms of the Act and doing so would lead to a better environmental result. Finally, some commenters argued that disaggregating the pollutants would also allow for more appropriate technology review.

After considering these comments, and taking into account other related actions that have occurred since proposal, we have determined that PSD and title V permitting program requirements will apply, as proposed, to the “single air pollutant that is comprised of the group of six GHGs.” 74 FR 55329, col. 1. We believe that this approach is both compelled by the statute and reflects the preferable policy approach.

As more fully discussed elsewhere in this rulemaking, the PSD requirements apply to a “major emitting facility” that undertakes construction or “modification.” CAA sections 165(a), 169 (2)(C). The term “major emitting facility” is defined as, in general, a source that emits 100 or 250 tons of “any air pollutant,” CAA section 169(1), and, similarly, the term “modification” is defined as a physical or operational change that results in the increased or new emissions of “any air pollutant.” CAA sections 169(2)(C), 111(a)(4). Through regulation, we have interpreted the term “any air pollutant,” as found in both the terms “major emitting facility” and “modification,” more narrowly to mean any “regulated NSR pollutant,” and we further define this term to include any pollutant that is “subject to regulation under the Act.” 40 CFR 52.21(b)(50)(iv), 52.21.(b)(2).¹⁴

Similarly, as discussed elsewhere, the title V requirements apply to a “major source,” which is defined, in general, as any source that emits at least 100 tpy of “any air pollutant.” CAA sections 502(a), 501(2)(B), 302(j). EPA has interpreted the term “any air pollutant” narrowly so that applies only with respect to air pollutants that are subject to regulation under the CAA. Memorandum from Lydia N. Wegman, Deputy Director, Office of Air Quality Planning and Standards, U.S. EPA, “Definition of Regulated Air Pollutant for Purposes of Title V” (Apr. 26, 1993).

Based on these provisions, the key issue for present purposes in determining whether a source is subject to PSD (because it qualifies as a major emitting facility that undertakes construction or modification) or title V

is whether the pollutant or pollutants that the source emits comprise the “air pollutant” that is “subject to regulation” under the Act.

The phrase “subject to regulation under the Act,” by its terms, identifies the air pollutant that is subject to PSD and title V as the same air pollutant that is identified in the regulatory action under another provision of the Act. The term is a simple cross-reference. It carries no implication that EPA, in identifying the pollutant to which PSD or title V apply, may redefine the pollutant that is regulated elsewhere in the Act. Whatever the pollutant is that is regulated elsewhere, it is that pollutant to which PSD and title V apply.

Since the time of our proposal, we have finalized both the contribution finding and the LDVR for GHGs. The final LDVR for GHGs specifies, in the rule’s applicability provisions, the air pollutant subject to control as the aggregate group of the six GHGs, including CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs.¹⁵ Because it is this pollutant that is regulated under the LDVR, it is this pollutant to which PSD and title V apply. Specifically, the applicability provision in the LDVR provides a clear reference to the definition of the single pollutant comprised of the aggregate group of the six well-mixed GHGs, which makes clear PSD and title V applicability depends on the same sum-of-six GHG construct. We must follow this construct of the aggregate group of the six gases and do not have discretion to interpret the GHG “air pollutant” differently for the purposes of PSD or title V.

This construct of the pollutant as the aggregate group of the six gases is also consistent with the definition of the air pollutant in the final contribution finding for GHGs [*see* 74 FR 66496, 66499, 66536–7 (December 15, 2009)]. There, the Administrator defined the air pollutant as the “aggregate group of the same six * * * greenhouse gases,” (74 FR 66536), and these well-mixed GHGs are defined to include CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs.

Moreover, even if we had discretion to identify the GHGs air pollutant differently in the permitting programs than in the LDVR, we believe it is reasonable to identify the GHGs air pollutant through the sum-of-six construct for the same reasons why we adopted that definition in the contribution finding and for additional reasons noted below specific to the permit programs. The term “air

¹⁴ By the same token, CAA section 165(a)(4) requires that a source subject to PSD impose best available control technology for “each pollutant subject to regulation under this chapter” that the source emits.

¹⁵ The applicability provision of the LDVR is found in 40 CFR 86.1818–12(a).

pollutant” is defined under CAA section 302(g) as “any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive * * * substance or matter which is emitted into or otherwise enters the ambient air.” Under this definition, EPA has broad discretion to identify an air pollutant, including, as appropriate, treating a combination of air pollutant agents as a single air pollutant. Here, we think that the six well-mixed gases are appropriately combined into a single air pollutant because, as noted in the contribution findings, they share several important attributes: Each of the six gases:

- Is directly emitted (and is not formed by secondary processes in the atmosphere);
 - Is long-lived in the atmosphere after it is emitted;
 - Is sufficiently long-lived that it becomes “well-mixed,” which means that its concentration is essentially uniform in the atmosphere (as opposed to having significant local/regional variation); and
 - Has well understood atmospheric properties (e.g., radiative forcing).
- See 74 FR 66516–66518.

In addition, treating the six GHGs as a single air pollutant is consistent with the actions of international scientific bodies. For example, the Intergovernmental Panel on Climate Change (IPCC) considers in various reports how the six gases drive human-induced climate change and how that affects health, society, and the environment. Similarly, the United Nations Framework Convention on Climate Change (UNFCCC) requires reporting of these six gases and the commitments under the UNFCCC and Kyoto Protocol are based on the combined emissions of these six gases. Finally, as discussed later, it is standard practice to compute the “CO₂ equivalency” of aggregate emissions using GWP.

We disagree with commenters who argued that grouping all six GHGs is not appropriate because GHGs are not like other air pollutants that are comprised of numerous substances of concern (e.g., VOCs and PM). First, as noted previously, we are following the approach to a single air pollutant comprised of the aggregate of the six GHGs initially adopted in the contribution finding and followed in the LDVR. Many of these same comments have already been addressed in the contribution finding and Response to Comment (RTC) document for that action, and those responses apply equally here.

In addition to the reasons described in the endangerment and contribution findings, there are CAA permitting programmatic and policy advantages to using the sum-of-six construct for the GHG air pollutant for PSD and title V applicability purposes. We believe now, as we did at proposal, that the benefits in using the cumulative group of GHGs outweigh any implementation advantages to using an individual-GHG-based metric. The advantages to sum-of-six definition include that it may: (1) Allow significantly more flexibility to sources for designing and implementing control strategies that maximize reductions across multiple GHGs and would also likely align better with possible future regulations that allow for such flexibility; (2) more effectively support possible future offsets or trading mechanisms that involve different source categories and different compositions of GHG emissions; and (3) could better accommodate and harmonize with future regulations because it establishes one class of pollutants that includes individual components that may, in turn, become subject to specific emission standards under future regulatory efforts.

We disagree with commenters who believe that aggregating the GHGs under one GHG metric for permitting applicability purposes would lead to an excessive amount of source permitting activity. This is because the phase-in approach addresses overwhelming permitting burdens associated with permitting of GHGs. It does so by designing our applicability thresholds to allow for a manageable amount of new permitting actions based on the emissions from sources using the sum-of-six metric. If we based applicability on individual gases, (assuming, again, that we had authority to deviate from the definition of “air pollutant” as used in the LDVR), we would still need to determine what level of permitting is manageable and appropriate based on thresholds on an individual gas basis and would expect that the final rule would result in the same levels of remaining burden. Accordingly, unless the permitting program were being implemented at the statutory thresholds, the effect of a decision to aggregate or not aggregate would not reduce workload; rather, it would simply shift work from permitting facilities that trigger based on combined GHGs to those that trigger based on individual GHGs. Although we acknowledge that this may affect applicability for a particular source, we disagree with the comment that doing so would conflict with our conclusions based on the

“absurd results” or “administrative necessity” doctrines. By using a consolidated and weighted measurement, we are able to direct the limited administrative resources to those new sources and modifications with the greatest impact on GHG emissions.

We also believe that the additional flexibility resulting from the sum-of-six GHG metric will provide substantially more opportunities for sources to address emission increases of GHGs than they would have had under an individual gas based metric, and, thereby, possibly reduce their permitting burden through multi-gas mitigation strategies. We disagree with the comment that isolating BACT review on sources that emit a single GHG necessarily leads to better environmental results than it would for sources that undergo a combined review for all six gases. To the contrary, given that Congress built in considerations of energy, environmental, and economic impacts into the BACT requirement, we think that allowing consideration of those factors across six gases will likely result in decisions that more appropriately account for those impacts at the source.

2. Identifying Which GHGs Are Included in the Group

As discussed previously, we proposed to include the combination of six well-mixed GHGs as the air pollutant that triggers PSD and title V applicability: CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs. Some commenters supported including all six. They cite the proposed contribution findings that identify the pollutant through the sum-of-six construct, and they emphasize that EPA, in order to protect the public, has to control all the GHGs it has regulated and reduce the overall impact of the mix of six GHGs.

However, a substantial number of commenters, mainly from industry sectors who also disagree with grouping the GHGs together, contend that only the constituent gases that are actually subject to controls under the LDVR should be included in determining applicability under the Tailoring Rule. Some of these commenters believe that only the three compounds (CO₂, CH₄, N₂O) for which the LDVR contains emissions standards or caps should be considered in the GHG metric for permitting, while others would also add HFCs (which are included in a credit flexibility arrangement under the LDVR) for a total of four GHGs. These commenters argued that PSD is not triggered for all six GHGs by the LDVR because under the proposed PSD

interpretation in the Interpretive Memo, actual emission controls under the Act are required to trigger PSD obligations for a given pollutant. They also argue that including all six would conflict with EPA's rationale for the Tailoring Rule by leading to larger numbers of sources subject to permitting, thereby increasing the harm that EPA says it wants to avoid. They further assert that the EPA cannot exercise its discretion to widen the scope of PSD and title V applicability to six GHGs when it is relying on the judicial doctrines of "absurd results" and "administrative necessity" to narrow PSD and title V applicability. They explain that in their view, those doctrines apply only when EPA has taken all steps possible to narrow the scope of PSD and title V and thereby avoid the administrative problems that force it to rely on those doctrines.

There were a few comments on whether to include specific gases as part of the sum-of-six grouping. Several commenters representing sectors that have significant SF₆ usage specifically argue that SF₆ should not be included as a GHG, at least at this time, because there are no known SF₆ controls, it is not clear how PTE would be calculated from such facilities, and EPA has not addressed the economic burden that regulation of these facilities would create. A solid waste industry commenter asserts that the Tailoring Rule should confirm that CH₄ and N₂O will not be regulated under PSD or title V because these pollutants are only emitted in miniscule amounts from automobiles.

We disagree with commenters who suggest that because the LDVR actually reduces only four of the six GHGs, EPA may apply PSD and title V to only those four GHGs. It is true that the LDVR standard for the single air pollutant that is comprised of the aggregate of six GHGs consists of individual standards for only four particular constituents of the single air pollutant—which are emissions limits or caps for three GHGs (CO₂, CH₄, and N₂O) and an emission crediting option for one GHG (HFCs)—but this does not dictate that only those four compounds are subject to regulation for permitting purposes. Although the LDVR results in reductions only with respect to four specific GHGs, as a legal matter the LDVR standard covers the entire set of GHGs that as a class are the single "air pollutant" in the contribution finding. Similar to our rationale for addressing the group of six GHGs as one pollutant for PSD and title V applicability purposes, we must adhere to the definition of applicability, cited

previously, in the final LDVR for GHGs and include CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs. We do not have discretion to select only a subset of these gases in defining our GHG threshold metric for the permitting applicability purposes. See LDVR, May 7, 2010, 75 FR 25398–99, section III.A.2.c. (discussing EPA's exercise of discretion under section 202(a) in setting emissions standards applicable to emission of the single air pollutant).

For the same reasons, we disagree that this approach is inconsistent with the Agency's final action in "EPA's Interpretation of Regulations that Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program." While it is the case that only four constituent gases are reduced by the LDVR, the "air pollutant" that is controlled, and thus "subject to regulation," is the group of six, and it is this "air pollutant" to which PSD and title V apply.

We also disagree with commenters who suggested that including all six GHGs in determining permitting applicability would conflict with our "absurd results" and "administrative necessity" rationale for the phase-in periods and applicability thresholds for GHGs. Even if we did have discretion to identify the air pollutant for PSD and title V purposes as consisting of only four of the six well-mixed GHGs, we do not believe that doing so would have any meaningful impact on the administrative burdens that are at the heart of our reliance on the "absurd results" and "administrative necessity" doctrines. The number of additional permitting actions and amount of additional permitting burden resulting from including all six GHGs, rather than four, is minimal. This is because the administrative burden of GHG permitting is dominated by CO₂ and CH₄ emission sources. For example, with a major source threshold set at 100,000 tpy CO₂e, the combined population of sources that would be major for N₂O, HFCs, PFCs, and SF₆ accounts for fewer than two percent of the GHG sources that would remain covered.

For similar reasons, we disagree with commenters who specifically suggest SF₆ emissions should not be included in the applicability metric for GHGs. As we have stated earlier in this section, our selection of the GHG metric is driven by the definition of the "air pollutant" as defined in the LDVR, and in consideration of the final GHG endangerment finding. SF₆ is specifically included as one of the "well-mixed greenhouse gases" in the

definition of air pollutant in the contribution finding, and is included in the definition of the air pollutant in the LDVR for which that rule is applicable. We do not believe we have the discretion to define the "air pollutant" differently for PSD and title V applicability purposes than the definition of the "air pollutant" that is regulated elsewhere. In any event, including SF₆ emissions based on the thresholds finalized in this rulemaking does not add an excessive administrative burden for permitting authorities. Based on our threshold evaluation study, we estimate that less than 40 sources of SF₆ nationwide would exceed the 100,000 tpy CO₂e threshold. Furthermore, SF₆ is a high GWP gas and, as discussed elsewhere, we have included a mass-based trigger for high GWP gases that will likely have the effect of further reducing this count.

For the same reasons, we disagree with the commenters who suggest we include black carbon and other short-lived climate forcers to the list of GHGs, as well as commenters asking for an exclusion of CH₄ and N₂O. The definition of the air pollutant, as cited in the LDVR, includes CH₄ and N₂O and does not include black carbon or other short-lived gases.

3. Use of GWP vs. Mass-Based GHG Thresholds

For the reasons discussed previously, we are determining permit program applicability based on the sum-of-six well-mixed gases that comprise the GHG air pollutant. This section discusses our use of both the CO₂e metric and mass emissions of the GHGs for applicability purposes.

Under our proposal, a source's emissions of all six GHGs would be combined into a single metric by multiplying the mass of each individual GHG (in tpy) by its GWP value, and summing these products to determine the total emissions of the GHG pollutant in tpy CO₂e. We received comments on this aspect of the proposed metric. Several commenters explicitly support the use of GWP and the CO₂e metric for GHG emissions. These commenters believe EPA has the authority to select an appropriate metric to measure GHGs in the PSD program, and policy considerations support the choice of GWP. Some of them note that GWP is a widely-used metric which employs internationally-recognized conversion factors to compare GHGs based upon their climate properties, and some add that states and local areas that have climate action plans for GHG reductions use CO₂e. Some of these commenters believe this metric will ensure a

standard measure across all permitting agencies and will lead to a more effective system for permitting authorities and create more opportunities to reduce emissions over the full class of GHGs, rather than focusing on reducing individual GHGs.

On the other hand, some commenters oppose the use of GWP and CO₂e, believing that thresholds should be based on individual mass-based emissions for each GHG. Some of these commenters felt that EPA has no discretion to ignore the metric for regulation established by Congress for PSD in section 169 of the Act. Some commenters were also concerned that the use of CO₂e will complicate the implementation of BACT because sources that trigger PSD will be required to install BACT for each regulated pollutant, not for CO₂e. As a result, a source that exceeds the threshold primarily due to its CO₂ emissions would be forced to install BACT for all other individual GHGs, regardless of how minor those other emissions may be. Finally, a commenter was concerned that use of GWP would complicate implementation because GWP values can sometimes change.

In our proposal preamble discussion of GHG metric, EPA also raised the possibility of including a limitation in the metric to address the prospect (expected to occur only rarely) that high-GWP gases could be emitted in quantities less than statutory thresholds for PSD and title V but nevertheless exceed the proposed thresholds in terms of CO₂e. Most commenters on this subject support a dual threshold under which a source would be subject to title V or PSD only if its GHG emissions exceeded both the statutory thresholds on an actual tonnage basis and the tailored thresholds on a CO₂e basis. Commenters supporting this approach felt that it would be unlawful to apply PSD when GHGs are below the statutory thresholds, or when there is not a net emissions increase. Others added that the complexity of accounting for emissions according to both mass and GWP should be manageable and is not a reason to ignore the role of mass-based emission rates in determining the applicability of PSD requirements. Additionally, one commenter observed that a dual threshold is consistent with phasing in the Tailoring Rule and is an effective way to address the current uncertainty surrounding how to measure high-GWP gases such as SF₆. In contrast, a few commenters stated they do not support a dual threshold, primarily on the grounds that there is no benefit to the added complexity.

After considering these comments, we have decided to adopt applicability thresholds in the final rule based on a CO₂e metric for the sum-of-six well-mixed gases, and also to adopt an additional mass-based threshold for the sum-of-six gases as discussed in the proposal. First, as discussed in the previous section, we have explained why the appropriate pollutant for PSD purposes is the single pollutant GHG, which is composed of the six well-mixed gases. Regarding the CO₂e metric, we continue to believe there are a number of advantages, as laid out in the proposal, to a CO₂e measure that would not be available if we used only a mass-based metric. These include: (1) A CO₂e metric, by incorporating the GWP values, best addresses the relevant environmental endpoint, which is radiative forcing of the GHGs emitted; (2) when combined with a sum-of-six gases approach, the CO₂e metric best allows for consideration of their combined effects when sources emit any one or combination of the six well-mixed GHGs; (3) a cumulative CO₂e metric is consistent with the metric used in the mandatory GHG reporting rule and other related rules and guidelines; and (4) a CO₂e metric allows more flexibility for designing and implementing control strategies that maximize reductions across multiple GHGs. We recognize the tension between the mass-based metric in the statute and the CO₂e-based metric we are adopting in this rule, but as discussed later, we will address this by also retaining the mass-based metric. Moreover, given our need to tailor our approach to covering sources of GHGs, we believe that the considerations driving our choice to also use a CO₂e-based metric are appropriate for defining the phase-in and allow for permitting resources to be directed at those sources and modifications that have the greatest impact on radiative forcing of the GHGs emitted.

We recognize the concern of commenters who stated that we cannot ignore the statutory thresholds based on the mass-based emissions of an air pollutant as described under CAA section 169(1). As we mentioned in the proposal, because both the PSD and title V statutory thresholds are expressed on a mass basis (*i.e.*, tons of a pollutant with no weighting values applied) we were concerned from a legal standpoint that the metric proposed (CO₂e) could have the effect of subjecting to PSD or title V requirements a source whose emissions fall below the statutory threshold limits on a strictly mass basis, but whose CO₂e-based emissions exceed

the CO₂e thresholds we establish under the Tailoring Rule. As an example, in rare instances it is possible that a source may emit only a non-CO₂ GHG in very small amounts, on a mass basis, but one that carries a very large GWP. In this case, it is possible that the source may emit the GHG in amounts that fall below the PSD and/or title V statutory applicability threshold (100 or 250 tpy, as applicable) on a mass basis, but exceed the 100,000 CO₂e PSD and title V applicability thresholds for Step 2 finalized in this action. Under these circumstances, without a mass-based threshold, the source would trigger PSD and title V for its CO₂e emissions even though its GHG mass emissions would not, in fact, exceed the statutory triggers.

Upon review of the comments pertaining to this issue and further analysis of the legal and programmatic implications, we are adopting a two-part applicability process, for both major source applicability determinations for GHGs under PSD and title V and for determining if a net increase has occurred in PSD applicability determinations for modifications. As explained in the RTC document, we accomplish this two-step applicability approach by continuing to rely on the existing mass-based applicability provisions in the current regulations, and by including new regulatory provisions that add a definition of "subject to regulation" that in turn includes the phase-in thresholds. Similarly, for PSD modification reviews and associated netting analyses, the same two-step process must be used. Our summary in section IV.A described how we expect this provision to be implemented in practice.

We acknowledge that the possibility of changing GWP values is a downside to the use of CO₂e for the GHG metric, and we address this comment in the next section, where we discuss our plan to codify GWP values. By codifying GWP, any changes will be manageable, and, in our judgment, will not outweigh the benefits of a CO₂e-based approach. We also acknowledge that a CO₂e-based approach may appear to complicate the BACT review and implementation process. However, we disagree with the commenter's ultimate conclusion that BACT will be required for each constituent gas rather than for the regulated pollutant, which is defined as the combination of the six well-mixed GHGs. To the contrary, we believe that, in combination with the sum-of-six gases approach described above, the use of the CO₂e metric will enable the implementation of flexible approaches to design and implement mitigation and control strategies that look across all six

of the constituent gases comprising the air pollutant (*e.g.*, flexibility to account for the benefits of certain CH₄ control options, even though those options may increase CO₂). Moreover, we believe that the CO₂e metric is the best way to achieve this goal because it allows for tradeoffs among the constituent gases to be evaluated using a common currency.

4. Determining What GWP Values Are To Be Used

At proposal, we proposed to link the calculation of CO₂e for GHGs to GWP values in EPA's "Inventory of U.S. Greenhouse Gas Emissions and Sinks" (GHG Inventory). *See, e.g.*, proposed 40 CFR 51.166(b)(58). Numerous commenters expressed concerns about this proposal on various grounds, including the following:

- The EPA should follow the proper notice-and-comment procedures and the requirements of the Information Quality Act for the relevant technical underpinnings of the proposal. The EPA relies upon the GWPs of the IPCC without providing the supporting data for review, and it is inappropriate to use this as a basis for this rule without first making all the raw data available for public inspection and comment.

- The EPA cannot tie the definition of GWP to the GHG Inventory because it is a non-regulatory document that may be changed without notice-and-comment rulemaking. Before EPA uses a new GWP, that GWP must be subject to notice and comment to comply with the requirements of CAA section 307 and the Administrative Procedure Act (APA).

- An annual update of GWP would create a moving target for sources conducting applicability determinations and assessing compliance with minor NSR and PSD emission limits. The EPA needs to ensure that applicability and compliance with limits continue to be based on the GWP that existed when the determination was made or the limit was established.

- The EPA should freeze the GWP at the current values by incorporating those values into the regulation. The EPA could still revise the "NSR" GWP, but would have to revise the regulation to do so.

Commenters added that it is important to ensure that all permitting agencies are using the same calculations for the determination of CO₂e for GHGs.

We agree with commenters who suggested we should codify, either in the Tailoring Rule or through reference to codified values in another rulemaking, the GWP values to be used in permitting analyses. We agree that this approach provides certainty as to

which GWP values need to be used by permitting authorities and allows sources to plan appropriately for possible changes in the GWP values. As mentioned in the comments, recommended GWP values from IPCC can change over time. While this is infrequent—the last such changes were in 2007—when it occurs, there are generally significant lag times in universal adoption of new values because of inconsistencies that could be created in national inventories and emission reporting mechanisms. In a regulatory setting, such as in the permitting programs, this could potentially create significant implementation issues, such as when a GWP change occurs while a permit action is in progress.¹⁶ EPA also recognized similar potential implementation issues in developing its final mandatory GHG reporting rule, and codified in the regulatory text for that rule the GWP values to be used in reporting GHGs as part of that final rulemaking.

For these reasons, we have decided to follow the approach in the mandatory GHG reporting rule and require that for PSD and title V permitting requirements, wherever emissions calculations are performed, that permitting authorities and sources use GWP values that are codified in EPA rules. We will establish the GWP values for PSD and title V rules based on a cross-reference to the values that are codified in the EPA's mandatory GHG reporting rule. 74 FR 56395, Table A–1 to subpart A of 40 CFR part 98—Global Warming Potentials. Any changes to Table A–1 of the mandatory GHG reporting rule regulatory text must go through an appropriate regulatory process. In this manner, the values used for the permitting programs will reflect the latest values adopted for usage by EPA after a regulatory process and will be consistent with those values used in the EPA's mandatory GHG reporting rule. Furthermore, the lead time for adopting changes to that rule will provide a transition time to address implementation concerns raised by commenters.

5. Use of Short Tons vs. Metric Tons

We proposed that the GHG metric would be expressed in terms of English (or short) tons, rather than metric (or

long) tons. A few commenters support using short tons for this purpose. Others prefer the use of metric tons, and most of them note that the mandatory GHG reporting rule is based on metric tons and believe that the Tailoring Rule should be consistent with that rule. These commenters believe that using different units in the two rules would be confusing and could result in sources that are not subject to the mandatory GHG reporting rule becoming subject to PSD. Some of the commenters add that various "cap and trade" legislative proposals also quantify GHGs in metric tons. A few other commenters recommend that EPA harmonize the applicability thresholds established under the Tailoring Rule and the mandatory GHG reporting rule without expressing a preference for short or metric tons.

We are finalizing our proposal to use short tons because short tons are the standard unit of measure for both the PSD and title V permitting programs and the basis for the threshold evaluation to support this rulemaking. Calculation inputs for PSD are typically prepared in English units (*e.g.*, pounds of fuel, British thermal units (Btu), etc.) which is the common convention for all PSD analyses and the units of the statutory thresholds under the Act.

It is true that the GHG reporting rule uses metric tons, but this does not create an inconsistency between permitting programs and the reporting rule because the two rules already use different applicability approaches. Although we originally proposed 25,000 tpy as the major source level for permitting programs, which was similar to the threshold in the reporting rule, we decided to adopt substantially higher thresholds in the final rule.

Furthermore, even if the numbers were similar, the thresholds used for the reporting rule are based on actual emissions, while the PSD and title V programs thresholds are based on PTE. Therefore, we are less persuaded by arguments for consistency, and believe it is more important for ease of permit program implementation to ensure that GHG emissions calculations for PSD and title V will build on the same set of input variables used to develop short-ton based estimates for non-GHG pollutants. Thus, the use of short tons should actually facilitate the development of the GHG emission estimate. It would likely be more confusing to require a multi-pollutant PSD applicability analysis to present emissions information using different units for different pollutants, as would be the case if we required metric tons for GHG but continue to use short tons

¹⁶ We note that our approach does not entirely avoid the possibility that a GWP change can occur while a permit is in progress although it will ensure advance notice of such a change. In the event that we plan to propose a change to GWP values, we will work with permitting authorities as necessary to provide guidance to sources on transitional issues.

for every other pollutant. Finally, we do not expect this choice to introduce additional complexity because the conversion between short tons and metric tons is a very simple calculation. Therefore, based on these considerations we are requiring that short tons be used as the basis for emission calculations used to meet PSD and title V permitting requirements.

B. Rationale for Thresholds and Timing for PSD and Title V Applicability to GHG Emissions Sources

In this subsection, we describe our legal and policy rationale for our determinations concerning PSD and title V applicability to GHG emissions sources. This subsection includes: (1) An overview of our rationale; (2) data concerning costs to sources and administrative burdens to permitting authorities; (3) a review of the *Chevron* legal framework and the “absurd results,” “administrative necessity,” and “one-step-at-a-time” doctrines, as well as a review of how those doctrines fit into the *Chevron* framework; (4) an overview of the relevant PSD and title V requirements and their legislative history; (5) our application of the “absurd results” doctrine for tailoring the PSD requirements; (6) our application of the “absurd results” doctrine for tailoring the title V requirements; (7) our plans to issue further rulemaking that will address the “absurd results” basis for both PSD and title V requirements; (8) our rationale for the phase-in schedule for applying PSD and title V to GHG sources; (9) our application of the “administrative necessity” basis for tailoring the PSD and title V requirements; and (10) our application of the “one-step-at-a-time” basis for tailoring the PSD and title V requirements.

1. Overview

Under the familiar *Chevron* two-step approach to construction of agency-administered statutes, the agency must first, at *Chevron* Step 1, determine whether Congress’s intent in a particular provision on a specific question is clear; and if so, then the agency must follow that intent. If the intent of the provision is not clear, then the agency may, under *Chevron* Step 2, fashion a reasonable interpretation of the provision. The best indicator of congressional intent is the literal meaning of the provision and generally, according to the case law, if the literal meaning addresses the specific question, then the agency should follow the literal meaning.

However, the courts have developed three doctrines relevant here that authorize departure from a literal

application of statutory provisions. The first is the “absurd results” doctrine, which authorizes such a departure if the literal application would produce a result that is inconsistent with congressional intent, and particularly if it would undermine congressional intent. The judicial doctrine of “administrative necessity” authorizes an agency to depart from statutory requirements if the agency can demonstrate that the statutory requirements, as written, are impossible to administer. The “one-step-at-a-time” doctrine authorizes an agency, under certain circumstances, to implement a statutory requirement through a phased approach. Each of the three doctrines fits into the *Chevron* framework for statutory construction because each of the three is designed to effectuate congressional intent.

To apply the statutory PSD and title V applicability thresholds literally to sources of GHG emissions would bring tens of thousands of small sources and modifications into the PSD program each year, and millions of small sources into the title V program. These extraordinary increases in the scope of the permitting programs would mean that the programs would become several hundred-fold larger than what Congress appeared to contemplate. Moreover, the great majority of additional sources brought into the PSD and title V programs would be small sources that Congress did not expect would need to undergo permitting and that, at the present time, in the absence of streamlined permit procedures, would face unduly high permitting costs. Further, again at the present time, in the absence of streamlined permit procedures the administrative strains would lead to multi-year backlogs in the issuance of PSD and title V permits, which would undermine the purposes of those programs. Sources of all types—whether they emit GHGs or not—would face long delays in receiving PSD permits, which Congress intended to allow construction or expansion. Similarly, sources would face long delays in receiving title V permits, which Congress intended to promote enforceability. For both programs, the addition of enormous numbers of additional sources would provide relatively little benefit compared to the costs to sources and the burdens to permitting authorities. In the case of PSD, the large number of small sources that would be subject to control constitute a relatively small part of the environmental problem. In the case of title V, a great many of the sources that would be newly subject to permit

requirements would have “empty” permits, that is, permits that do not include any applicable requirements, and that therefore serve relatively little purpose. For these reasons, the “absurd results” doctrine applies to avoid a literal application of the thresholds at this time. By the same token, the impossibility of administering the permit programs brings into play the “administrative necessity” doctrine. This doctrine also justifies not applying the PSD or title V applicability threshold provisions literally to GHG sources at this time.

The situation presented here is exactly the kind that the “absurd results,” “administrative necessity,” and “one-step-at-a-time” doctrines have been developed to address. Separately and interdependently, they authorize EPA and the permitting authorities to tailor the PSD and title V applicability provisions through a phased program as set forth in this rule, and to use the initial period of phase-in to develop streamlining measures, acquire expertise, and increase resources, all of which would facilitate applying PSD and title V on a broader scale without overburdening sources and permitting authorities. In this manner, the phased approach reconciles the language of the statutory provisions with the results of their application and with congressional intent.

2. Data Concerning Costs to Sources and Administrative Burdens to Permitting Authorities

This final action concerning applicability of PSD and title V to GHG-emitting sources, including the decisions on timing for the selected permitting thresholds, is based on our assessments of both the costs to the regulated sources to comply with PSD and title V permitting requirements and the administrative burdens to the permitting authorities to process PSD and title V permit actions for GHG-emitting sources. This section provides a summary of our cost and administrative burden assessments of permitting that would be required in the absence of any tailoring as well as under various tailoring options.

Our estimates of costs to the sources and administrative burdens to the permitting authorities from PSD and title V applicability for GHG emissions are based on labor and cost information from the existing Information Collection Requests (ICRs) for PSD and title V programs.¹⁷ We apply the same basic

¹⁷ “Summary of Methodology and Data Used to Estimate Burden Relief and Evaluate Resource

methodology used for the proposal, which incorporates information on numbers and types of affected sources and estimated permitting actions. We evaluate administrative burdens in terms of staffing needs, time for processing permits, and monetary costs, and we make some judgments about how those burdens would affect the permitting authorities' ability to effectively manage and administer their programs with the addition of GHG emission sources. We present the administrative burden data for applying PSD and title V requirements at the literal statutory thresholds—that is, the 100/250 tpy levels for PSD (and 0 tpy for modifications) and the 100 tpy level for title V—as well as at other thresholds, which range from 25,000 tpy CO₂e to 100,000 tpy CO₂e. We have significantly revised upwards our assessments of costs to sources and administrative burdens since proposal, and we summarize later our reasons for doing so. We also present significant comments concerning administrative burdens, and our responses to those comments.

In the next section, concerning legal and policy rationale for our actions, we discuss how these data on costs to the sources and administrative burdens to the permitting authorities informed our decisions that PSD and title V requirements should not, at present, be applied to GHG-emitting sources under the literal terms of the statutory thresholds as well as our decisions concerning what thresholds to apply for Steps 1 and 2 of the applicability phase-in approach and the applicability floor of 50,000 tpy CO₂e.

a. Costs to Sources

As we did at proposal, we have estimated costs to the sources of complying with PSD and title V starting from the data in the ICRs. We recognize that the sizes of the sources, as measured by their emissions, that would be swept into the PSD and title V programs would vary greatly, and that their permitting costs would vary as well. For example, their PSD permitting costs would depend on the amount and types of their emissions and their control requirements. Accordingly, we have determined average costs, as described later.

For PSD, at proposal, we estimated that on average, an industrial source would incur costs of \$84,500 to prepare the PSD application and receive the permit, and on average, a commercial or

residential source would incur costs of 20 percent that amount, or \$16,900. 74 FR 55337 col. 3 to 55339 col. 3. For this action, we retain the same burden estimates for an average industrial source. This type of source would need 866 hours, which would cost \$84,500, to prepare the application and the PSD permit. However, based on comments received, we have determined that a more accurate estimate for an average commercial or residential source is 70 percent of that amount of time that an industrial source would need, up from our proposal of 20 percent. Thus, an average commercial or residential source would need 606 hours, which would cost \$59,000, to prepare the PSD application and receive the permit. We are increasing this time over what we proposed because we now recognize that virtually all commercial and residential sources will have no experience with the PSD permitting process, and therefore will face a significant learning curve that will entail more time to complete the application, develop control recommendations, and take the other required steps. We believe this learning period could extend from 2 to possibly 4 years or more from the date that the sources become subject to PSD requirements, depending on the type and actual number of new sources that come in for permitting. In addition, we expect that in many cases, draft PSD permits for GHGs will receive comments from various stakeholders, from citizens groups to equipment vendors, who will seek to participate in the permit process, and that all this could add to the hours that the permittee will need to invest in the process.¹⁸ The actual costs to sources to install BACT controls, while still uncertain at this point, would likely add additional costs across a variety of sources in a sector not traditionally subject to such permitting requirements.

For title V, at proposal, we estimated that on average, an industrial source would incur costs of approximately \$46,400 to prepare the title V application and receive the permit, and on average, a commercial or residential source would incur costs of 10 percent that amount, or almost \$5,000. 74 FR 55338 col. 1 to 55339 col. 3. For this action, we retain the same burden estimates for an average industrial source. This type of source would need 350 hours, which would cost \$46,400, to prepare the application and the title V

permit. However, we have determined that a more accurate estimate for an average commercial or residential source is 50 percent of that amount of time that an industrial source would need, up from our proposal of 10 percent. Thus, an average commercial or residential source would need about 175 hours, which would cost \$23,200, to prepare the title V application and receive the permit. This increase is due to the same reasons as with the PSD program just discussed. We now recognize that virtually all commercial and residential sources will have no experience with the title V permitting process and, therefore, will face a significant learning curve that will entail more time to assess, for the first time, their GHG emissions (because such sources are not covered by EPA's mandatory GHG reporting rule), complete the application, respond to permitting authority comments, meet other title V administrative requirements, and respond to interested stakeholders.¹⁹

b. Administrative Burdens to Permitting Authorities

(1) Estimated Permitting Authority Burden at Proposal

As at proposal, we estimated the administrative burdens to the permitting authorities at the various threshold levels for PSD or title V applicability as follows. First, for a particular threshold level, we estimated the number of GHG-emitting sources that would be subject to PSD requirements because they would undertake new construction or modification, and the number of existing sources that would be subject to title V requirements. Second, we estimated the average additional administrative burden and cost of each PSD permitting action and each title V permitting action for the GHG-emitting sources. Third, we multiplied those two estimates, and the product is the additional administrative burden at the particular threshold level. We employed the same methodology for this final rule, but, as discussed later, and described in more detail in our final burden analysis,²⁰ we have updated several key assumptions since the proposal as a

¹⁹ "Summary of Methodology and Data Used to Estimate Burden Relief and Evaluate Resource Requirements at Alternative Greenhouse Gas (GHG) Permitting Thresholds"; Prepared by EPA Staff; March 2010.

²⁰ "Summary of Methodology and Data Used to Estimate Burden Relief and Evaluate Resource Requirements at Alternative Greenhouse Gas (GHG) Permitting Thresholds"; Prepared by EPA Staff; March 2010.

Requirements at Alternative Greenhouse Gas (GHG) Permitting Thresholds"; Prepared by EPA Staff; March 2010.

¹⁸ "Summary of Methodology and Data Used to Estimate Burden Relief and Evaluate Resource Requirements at Alternative Greenhouse Gas (GHG) Permitting Thresholds"; Prepared by EPA Staff; March 2010.

result of our consideration of comments received.

First, we present the administrative burdens at the statutory levels for PSD and title V applicability. At proposal, for the PSD program, we estimated the administrative burdens that would result from applying PSD at the 100/250 tpy major emitting facility threshold levels in two ways, as described in this section. We stated that at present, 280 sources are subject to PSD each year, both for new construction and modifications. This figure served as the baseline from which to calculate increases in administrative burdens due to permitting GHG-emitting sources.

The first method that we used to calculate the administrative burdens to the permitting authorities was in terms of workload hours, which we then converted to monetary costs. To make the workload calculation, we first estimated the number of GHG-emitting sources that would become subject to PSD through new construction and modification. Based on our GHG threshold data analysis, we estimated that almost 41,000 new and modified sources per year would become subject to PSD review. We first calculated the number of new sources that would become subject to PSD. To do this, we estimated growth rates for the various sectors, and then applied those growth rates to the numbers of sources in those sectors. We then calculated the number of modifications. To do this, we first assumed that each year, two percent of sources that meet or exceed the threshold levels for PSD applicability due to their conventional pollutants undertake modifications. We then calculated the number of sources that would meet or exceed the threshold levels for PSD applicability due to their GHG emissions, and applied the same assumption that two percent of them would undertake modifications. In this manner, we estimated the number of modifications of GHG-emitting sources that would become subject to PSD.

We noted that currently, 280 PSD permits are issued each year, but that applying PSD to GHG-emitting sources at the 100/250 tpy statutory threshold levels would cause an increase in permits of more than 140-fold. The reason for the extraordinary increase in PSD applicability lies simply in the fact that it takes a relatively large source to generate emissions of conventional pollutants in the amounts of 100/250 tpy or more, but many sources combust fossil fuels for heat or electricity, and the combustion process for even small quantities of fossil fuel produces quantities of CO₂ that are far in excess of the sources' quantities of

conventional pollutants and that, for even small sources, equal or exceed the 100/250 tpy levels.

Based on the 140-fold increase in permits, we then estimated the per-permit burden on permitting authorities. As we stated in the proposal:

We estimated the number of workload hours and cost a permitting authority would expend on each new source and each modification. We based these estimates on the workload hours and cost for processing permits for new sources of non-GHG emissions, which we derived from labor and cost information from the existing ICRs for PSD programs. The ICRs show that permitting authorities expend 301 hours to permit a new or modified industrial source * * *.

We then made assumptions for number of workload hours and costs for new sources of GHG emissions. We assumed that permitting new industrial GHG sources that emit in excess of the 250-tpy threshold would be of comparable complexity to permitting non-GHG emitting industrial sources that are subject to PSD. Thus, for these sources, we assumed that permitting authorities would expend the same number of workload hours and costs, on a per-permit basis, as they do for non-GHG emitting industrial sources. On the other hand, for commercial and residential GHG sources that emit GHGs above the 250-tpy threshold (and as a result would be subject to the requirements of the PSD permitting program at this threshold level), we assumed that the workload hours and cost for permitting these sources would be significantly less than—only 20 percent of—the hours and cost necessary to prepare and issue initial PSD permits or permit modifications for industrial GHG sources. This 20-percent estimate amounts to 60 hours of permitting authority time per residential or commercial permit.

Based on these assumptions, the additional annual permitting burden for permitting authorities, on a national basis, is estimated to be 3.3 million hours at a cost of \$257 million to include all GHG emitters above the 250-tpy threshold.

74 FR 55301 col. 2.

Note that at the proposal, in calculating the PSD administrative burdens that would occur each year due to GHG emissions, we did not undertake separate calculations for the administrative burdens associated with permitting obligations stemming from the GHG emissions of the 280 sources already subject to PSD permitting requirements due to their conventional pollutants. In effect, we treated these 280 sources as part of the over 40,000 sources that would become subject to PSD due to their GHG emissions.

The second way that we evaluated the burden on permitting authorities was by reviewing a study conducted by state and local air permitting agencies. As we said in the preamble:

In addition to conducting our burden analysis, we also reviewed summary information from state and local air permitting agencies regarding additional resources and burden considerations if GHG sources that emit above the 100/250-tpy thresholds were subjected to the PSD and title V programs. This information covered 43 state and local permitting agencies, representing programs from different regions of the country and various permitting program sizes (in terms of geographic and source population coverage) * * *. This information showed significant burdens projected by permitting agencies with adding sources of GHG emissions in terms of staffing, budget, and other associated resource needs. Importantly, the agencies based their analysis on the assumption that, for purposes of determining whether a source is major, its emissions would be calculated on an actual emissions ("actuals") basis, and not on a PTE basis. On an actuals basis, the agencies estimated a 10-fold increase in the number of permits.

Specifically, the agencies estimated that:

- Assuming, again, that number of permits was to increase by 10-fold (based on actual emissions), the resulting workload would require an average of 12 more [full-time equivalents (FTEs)] per permitting authority at an estimated cost of \$1 million/year;
- Without the additional FTEs, the average processing time for a permit would increase to 3 years, which is three times the current average processing time;
- Permitting authorities would need 2 years on average to add the necessary staff;
- Permitting authorities would also need, on average, eight additional enforcement and judicial FTEs;
- Ninety percent of permitting agencies would need to train their staff in all aspects of permitting for sources of GHG emissions.
- A quarter of permitting agencies were currently under a hiring freeze.

We went on to explain that this state survey significantly underestimated the administrative burdens:

It is important to reiterate that the state and local permitting information on burden was based on the number of additional facilities subject to PSD because their emissions of GHGs exceed the 100/250-tpy thresholds at actual emissions rates, not PTE-based emissions rates. However, the PSD applicability requirements are based on PTE. By adjusting the increase in number of permits to account for GHG sources that exceed the 100/250-tpy applicability thresholds based on their PTE emissions, EPA estimated a 140-fold increase in numbers of PSD permits, much more than the 10-fold increase estimated by the states based on actual emissions.

74 FR 55301 col. 2–3.

In addition to PSD, we also estimated title V burdens at the statutory threshold. At proposal, for the title V program, we estimated the administrative burdens that would result from applying title V requirements at the 100 tpy major

source threshold level in the same two ways as for PSD, as follows. The first method was to calculate the administrative burdens in terms of workload hours, which we then converted to monetary costs. To make the workload calculation, we first estimated the number of existing GHG-emitting sources that would become subject to title V. Based on our GHG threshold data analysis, we estimated that approximately 6 million sources would become subject to title V. Compared to the 14,700 title V permits currently issued, this would be an increase in permits of more than 400-fold. We noted, in addition, that most of the 14,700 sources already subject to title V also emit GHGs and may be affected as well.

We then described the type of work that the permitting authorities would need to do for these GHG-emitting sources—the six million that would become newly subject to title V and most of the 14,700 that are already subject to title V—as follows. Note at the outset that the permitting authorities' workload is greater for sources newly subject to title V than for existing sources that seek a revised or renewed permit. As EPA noted in the preamble:

[T]he [] permits [for the 6 million new sources] would need to include any requirements for non-GHGs that may apply to the source, such as provisions of an applicable SIP. For any such requirements, permitting authorities would also need to develop terms addressing the various compliance assurance requirements of title V, including monitoring, deviation reporting, six-month monitoring reports, and annual compliance certifications.

Adding to the burden described above would be the burden to add GHG terms to the 14,700 existing title V permits. While, in general, existing title V permits would not immediately need to be revised or reopened to incorporate GHG (because as noted above, there are generally not applicable requirements for GHGs that apply to such sources), permitting authorities may face burdens to update existing title V permits for GHG under two possible scenarios: (1) EPA promulgates or approves any applicable requirements for GHGs that would apply to such a source, which would generally require a permit reopening or renewal application, or (2) the source makes a change that would result in an applicable requirement for GHGs to newly apply to the source, such as PSD review, which would generally require an application for a permit revision. Permitting authorities will also need to process permit renewal applications, generally on a five-year cycle, and such renewals would need to assure that the permit properly addresses GHG. Finally they would have to process title V applications for new sources (including all the PSD sources previously discussed).

74 FR 55302 cols. 2–3.

In light of those demands, we estimated the per-permit burden on permitting authorities as follows. Note, at the outset, that as with PSD, we based the workload hours on information in ICRs for industrial sources, and we then assumed that the workload for commercial and residential sources would be the indicated percentage of the workload for industrial sources:

As with PSD, we have quantified the extent of the administrative problem that would result in workload hours and cost on the basis of information concerning hours and costs for processing existing title V permits that is indicated on ICRs. However, we recognize that more than 97 percent of these new sources would be commercial and residential sources. We estimate that for permitting authorities, the average new commercial or residential permit would require 43 hours to process, which is 10 percent of the time needed for the average new industrial permit. For an average existing permit, which permitting authorities would need to process through procedures for significant revisions and permit renewals, adding GHG emissions to the permit would result in, we estimate, 9 additional hours of processing time, which is 10 percent of the amount of time currently necessary for processing existing permits. We estimate that the total nationwide additional burden for permitting authorities for title V permits from adding GHG emissions at the 100-tpy threshold would be 340 million hours, which would cost over \$15 billion.

74 FR 55302 col. 3.

As with PSD, the second way that we evaluated the burden on permitting authorities at the statutory threshold was by reviewing a study conducted by state and local air permitting agencies of the burden of applying title V to existing GHG-emitting sources at the 100 tpy statutory threshold level. As we said in the preamble to the proposed rule:

[W]e also reviewed summary information from state and local permitting agencies, which showed significant burdens associated with adding GHGs in their title V programs in terms of staffing, budget, and other associated resource needs.²¹ Again, note that the permitting agencies based their estimates on numbers of permits that would be required from sources subject to the 100-tpy title V applicability threshold on an actuals—not PTE—basis. Based on that level, the agencies assumed a 40-fold increase in numbers of permits, and estimated that:

- The resulting workload would require an average of 57 more FTEs per permitting agency at an estimated cost of \$4.6 million/year;
- Without the additional FTEs, the average processing time for a permit would increase

to almost 10 years, which is 20 times the current average permit processing time;

- Permitting authorities would need 2 years on average to add the necessary staff;
- On average, permitting authorities would need 29 additional enforcement and judicial staff;
- Eighty percent of permitting authorities would need to train their staff in all aspects of permitting for sources of GHG emission.
- A quarter of permitting agencies were currently under a hiring freeze.

As with PSD, we added that this state survey significantly underestimated the administrative burdens:

It is important to reiterate that, as with PSD, the state and local information on projected permitting burden is based on the number of additional facilities subject to title V because their emissions of GHGs exceed the 100-tpy thresholds at actual emissions rates, not the PTE-based emissions rates. However, the title V applicability requirements are based on PTE. As noted elsewhere in this preamble, the state and local agencies estimated a 40-fold increase in numbers of title V permits based on the amount of GHG sources' actual emissions. By adjusting the summary estimates provided by the state and local agencies to account for GHG sources that exceed the 100-tpy threshold based on their PTE emissions, EPA estimated that the average permitting authority would need 570 more FTEs to support its title V permitting program.

74 FR 55302 col. 3—55303 col. 1.

(2) Revisions to Proposal Estimates of Permitting Authority Burden

We received numerous comments from state and local authorities stating that EPA had underestimated the administrative burden on the permitting authorities in the proposal. State and local authorities stated that in particular, EPA underestimated the number of modifications and the amount of time it would take permitting authorities to process permits, particularly for commercial and residential sources. Based on the comments and additional analysis that we have conducted in response, we are revising in several respects our estimates of the administrative burdens for applying PSD and title V at the statutory threshold levels.

First we present revisions to our analysis regarding the burdens at the statutory levels. Before we present those changes, we want to note a revision to our methodology that affected our estimate of the number of permits currently issued under existing programs. We are revising upwards the number of sources that are already subject to PSD permitting requirements anyway for their conventional pollutants, which, as discussed previously, we refer to as “anyway” sources. This revision has implications

²¹ “NACAA Summary on Permitting GHGs Under the Clean Air Act”; Memorandum from Mary Stewart Douglas, National Association of Clean Air Agencies to Juan Santiago, EPA/OAQPS, September 3, 2009.

both for (1) the number of sources that would become subject to PSD due to their GHG emissions; and also (2) the baseline number of sources already subject to PSD, which we use to compare the amount of increases in administrative burden due to permitting GHG sources. At proposal, we stated that 280 sources each year are subject to PSD due to their new construction or modifications. However, upon further analysis, we have realized that this figure is too low because it includes only sources that have emissions of one or more NAAQS pollutants at the 100/250 tpy thresholds and that are located in areas of the country that are designated attainment or unclassifiable for all of those pollutants, and thus are not designated nonattainment for any of those NAAQS pollutants. We estimate that another 520 sources have emissions of one or more NAAQS pollutants at the 100/250 tpy thresholds and are located in areas of the country that are nonattainment for at least one of those NAAQS pollutants. Some of these 520 sources may also emit one or more pollutants at the 100/250 tpy level for which their area is designated attainment or unclassifiable, and therefore may be subject to PSD for those pollutants. Accordingly, the correct number of “anyway” sources subject to PSD each year is the 280 sources that are located in areas that are attainment or unclassifiable for each pollutant that the sources emit at the 100/250 tpy level, plus at least some of the 520 sources that are located in areas that are nonattainment for at least one of the NAAQS pollutants that the sources emit at or above the 100/250 tpy threshold. In the absence of data on the number of nonattainment NSR permits that do *not* have a PSD component, and because we expect this to be a small number, we have assumed for purposes of this action, that each of the 520 sources is subject to PSD for at least one pollutant, so that we will consider all 800 sources as subject to PSD. Of this number, we estimate that 70 percent, or 560 sources will undergo a modification, while the remaining 240 permitting actions will involve new construction. Of the modifications, we assume that 80 percent, or 448, would become subject to additional requirements due to their GHG emissions because those projects have combustion-related activities that would likely emit GHGs in the requisite quantities. Our estimate of 80 percent of modification activities significantly involving combustion activities is based on a review of a random sample of PSD permits. In total we estimate that 688

sources, either upon new construction or modification, would need to add GHG requirements to their otherwise required PSD permitting action.

We should also note that in this rulemaking we are justifying our conclusions about permitting authority administrative burdens on the basis of their PSD and title V cost as calculated on both a separate basis and a combined basis. That is, we believe that the administrative burdens of the PSD program justify our tailoring approach for the PSD requirements, and the administrative burdens of the title V program justify our tailoring approach for the title V requirements, but in addition, the administrative burdens of both programs on a combined basis justify the tailoring approaches. Viewing the administrative burdens on a combined basis provides a useful perspective because most permitting authorities have a single organizational unit that is responsible for both the PSD program and the title V program, and in many cases, the same employees work on both programs. In addition, in some jurisdictions, permitting authorities issue a single, merged permit that includes both PSD and title V requirements. For these reasons, considering administrative burdens on a combined PSD and title V basis, offers a more accurate picture of the issues these agencies will face in transitioning to GHG permitting.

Turning to the revisions to our burden estimates that we made as a result of public comment, we begin by noting that many commenters believed that we significantly underestimated the administrative burdens associated with the proposed thresholds or that the administrative burden under the proposed thresholds would still overwhelm the states and result in significant permitting delays and uncertainty for sources. Many of these commenters indicate that our estimate of the number of sources that would be subject to permitting is too low, and some add that we have underestimated the per-permit effort required. (More detail on these comments is given elsewhere on the methodology used in the analysis.) Several state and local agencies provided estimates of the increased number of permits and/or staff that would be required under the thresholds we proposed that were higher than our original estimates. Specifically, commenters recommended that we increase the estimated administrative burdens for PSD permits by anywhere from 100 percent to over 2,000 percent; and that we increase the burdens for title V permits by anywhere from 29 percent to 240 percent. Many

commenters indicated that EPA has not adequately accounted for “synthetic minor” sources or modification projects, stating that many such sources and projects will not be able to keep GHGs below the proposed thresholds, and those who could do so may not be able to establish enforceable synthetic minor limits. Numerous commenters also stated that the EPA has underestimated the rate of major modifications for GHGs under PSD. Some commenters assert that we underestimated the number of permits required for specific industry sectors, including the oil and gas production industry, the natural gas transmission industry, the semiconductor industry, the wood products industry, the brick industry, and landfills. Some of the state and local commenters also believe that we have overestimated their ability to hire and train sufficient staff to administer GHG permitting.

We are persuaded by the data and arguments provided by the many commenters who believe EPA underestimated the number of permitting actions and the burdens of each action, and thus the overall administrative burdens associated with permitting GHG sources. Accordingly, we have reevaluated our assessment of these administrative burdens, for both the PSD and title V programs. In conducting this reevaluation, we considered arguments made by the commenters, as well as any actual data they provided, and then we determined whether and how to modify various aspects of our detailed assessment of the burdens. Based on this consideration we have substantially revised upwards our estimate of administrative burdens, based on the analysis included in the final docket for this rulemaking.²² The revisions affect two elements of our analysis by showing: (1) A substantial increase in the number of PSD and title V permits that will occur at a given threshold, and (2) an increase in the average burden estimate for each such permit.

Regarding the increase in our estimate of the number of projects that will occur, we estimated an increase in both PSD and title V permit actions, though the greatest changes were for PSD. At proposal, we estimated that, if PSD requirements were to apply to GHG sources at the 100/250 tpy statutory levels, 40,496 projects—consisting of 3,299 projects at industrial sources and 37,197 projects at commercial or

²² “Summary of Methodology and Data Used to Estimate Burden Relief and Evaluate Resource Requirements at Alternative Greenhouse Gas (GHG) Permitting Thresholds”; Prepared by EPA Staff; March 2010.

residential sources—would need PSD permits each year. Some of these projects involve the construction of an entirely new source, but the majority of these are modifications. We now estimate that at the 100/250 tpy levels, 81,598 projects would become subject to PSD each year. These projects include 26,089 actions at industrial sources and 55,509 at commercial and residential sources. We describe our calculation of this 81,598 amount in a TSD.²³ The great majority of these 81,598 projects that would become subject to PSD are modifications. We base these estimates on the assumption that the significance levels would be 100 tpy regardless of category.

Our estimate of the number of PSD modifications is where we made our most significant upward revisions from our proposal, based on comments. Our doubling of the estimated PSD permitting actions—from 40,496 at proposal to 81,598—results from three separate adjustments we made to our estimates at proposal of the number of permit actions that would result from applying PSD to GHG sources. Two of these increased the number of major modifications, and one of these increased the number of major sources and modifications. The most significant adjustment, and one that was raised by multiple commenters, was that we undercounted the number of major modification projects at existing major sources because we did not include the existing projects that avoid major PSD review by either taking “synthetic minor” limits or by netting out for conventional pollutants, but that would not be able to avoid PSD through those mechanisms for GHGs.

We agree that the ability and procedures for sources to achieve reductions, or minimize increases, due to GHGs through adoption of enforceable limits or through netting out are not well established at this point. We believe that there will be numerous instances, particularly for combustion-related projects, where it will not be possible for sources to achieve the same level of reductions for CO₂ emissions as they do for emissions of nitrogen oxides (NO_x), for example, simply because there are not as many proven control techniques that can reduce CO₂ emissions to the same degree as NO_x. Also, more research will be necessary in the type of emission units and processes resulting in GHG emissions, and how they operate over a wide range of

utilization patterns at a variety of source categories, before permitting authorities will be able to establish procedures and rules for developing minor source permit limitations. Therefore, we adjusted our count of major modification permits under PSD upward to account for this.

The second change to the number of permits concerns the general modification rate of 2 percent that we applied at proposal, based on historical experience across all pollutant types. Commenters provided information that suggest that this 2 percent figure is an underestimate for GHG sources because their emissions of CO₂ are high and accumulate quickly from various changes involving combustion units. Therefore, a greater percentage of their physical or operational changes will result in GHG emissions in excess of the significance levels that we identified at proposal. In light of these comments, we reviewed the source populations and pollutant mix within the various populations, and determined that we should revise our general modification rate to 4 percent for GHG sources. This 4 percent rate was obtained by dividing the current annual major NSR permit actions involving modifications by the 14,700 existing sources. We have revised our burden analysis accordingly. Again, the burden analysis in the docket describes our basis for these calculations in more detail.

The third adjustment to the number of permits involves our estimate of the number of sources with PTE that is greater than the various thresholds considered. This affects the number of major sources at the statutory thresholds, which we used to estimate the number of PSD and title V major sources, but also has an effect on the number of major modifications because the number of modifications depends on the size of the population of major sources. Commenters provided evidence that our estimates of capacity utilization (which, as described previously, we use for estimating potential-to-emit based on data for actual emissions) for the general manufacturing source category (referred to as “unspecified stationary combustion” in our analysis) and for the oil and gas industry were not accurate. In our proposal, our estimated range for capacity utilization for “unspecified stationary combustion” varied from 70 to 90 percent depending on manufacturing category. For the oil and gas industry, our estimate was 90 percent. We received comments indicating that these utilization rates are higher than what is normally achieved in real-world conditions, particularly for smaller manufacturing type facilities.

Accordingly, in this action, we are using a 50 percent capacity utilization rate for both of these source categories, which better reflects what can be deemed reasonable operation under normal conditions for facilities in these source categories. This adjustment increased the overall number of affected facilities at various threshold levels and we have revised our burden analysis accordingly.

A few commenters asserted that we underestimated the number of residential homes, commercial buildings, and retail stores that would be subject to permitting requirements because these commenters believed the estimate in EPA’s TSD was based on actual emissions from space heating equipment rather than PTE. We wish to clarify that our threshold analysis estimates for the number of residential and commercial sources (as well as all other sources) did use a PTE basis. To calculate the PTE amount for these sources, we extrapolated from the actual emissions data for the residential and commercial sources. Specifically, we assumed that a typical residential facility operates its fuel combustion sources at only 10 percent of its capacity and a typical commercial facility operates at only 15 percent of its capacity. Based on these assumptions, we multiplied residential actual emissions by a factor of 10, and commercial actual emissions by a factor of 6.6 to obtain PTE-based estimates. There is very little information available on the capacity utilization rates of fuel combustion equipment at different types of residential and commercial facilities, but we believe our methodology was reasonable for these types of sources and we did not adjust it in response to this comment. Information on the development of these estimates is provided in our Technical Support Document for Greenhouse Gas Emissions Thresholds Evaluation.

The second source of upward revisions to our administrative burden estimate is that we are increasing the estimated average cost to permitting authorities of issuing each PSD and title V permit at the statutory thresholds. At proposal, we estimated that for PSD permits, permitting authorities would expend, on average, 301 hours to permit an industrial source of GHG emissions, and 20 percent of that time, or 60 hours to permit a commercial or residential source. After estimating that amount of workload, we went on to estimate the monetary cost to permitting authorities of that workload. Similarly, for title V permits, we estimated at proposal that permitting authorities would expend 10 percent of the number of hours needed to process an industrial permit in order

²³ “Summary of Methodology and Data Used to Estimate Burden Relief and Evaluate Resource Requirements at Alternative Greenhouse Gas (GHG) Permitting Thresholds”; Prepared by EPA Staff; March 2010.

to process a commercial or residential permit for GHG sources.

We received comments from both permitting authorities and sources asserting that our methodology underestimated the administrative burden on grounds that (1) Our methodology fails to recognize that when a source triggers PSD for conventional pollutants, additional labor hours would be required to issue BACT for GHGs; (2) our estimate of 60 hours (versus 301 hours) to issue PSD permits to commercial and residential sources of GHGs is unrealistically low; (3) our estimate failed to account for the increase in the complexity of permits for criteria pollutants due to (i) increases in criteria pollutant emissions becoming newly subject to BACT at sources that are major only for GHGs, which will result in increased permitting and (ii) BACT controls for criteria pollutants (e.g., an oxidizer for VOCs) may result in significant GHG emissions, triggering an additional BACT determination; and (4) our methodology failed to account for the significant additional PSD and title V burdens due to sources that obtain federally enforceable permit limits on GHGs in order to become "synthetic minors" and thereby avoid PSD (and possibly also title V).

Based on these comments and our own reassessment of permitting actions created by the addition of GHGs, we have revised upwards in several ways our estimate of the additional permit costs of applying PSD and title V to GHG sources, including the following: First we have added an estimate of the additional permitting cost for adding a GHG component to "anyway" PSD and title V permitting actions for conventional pollutants. We estimated this burden based on information in the comments together with our own judgment about how to adjust the burden numbers contained in the current supporting statements for our approved permitting ICRs. These adjustments are found in our revised burden estimate document.

Second, we have raised the per-permit burden hours for commercial and residential sources for PSD and title V. At proposal, our estimates were based on the fact that many of these permits will be technically simpler due to such factors as a lower number of emissions points, simpler processes, and less required modeling. However, commenters pointed out that, until EPA streamlines its permitting procedures, there are many permitting activities that represent a fixed cost, such as public notice, hearing, and response to comment activities. In addition, we agree, as commenters pointed out, that

many of these sources will need significantly more permitting authority staff time to assist them in the permit application and preparation process because of their lack of experience with these requirements. In addition, permitting authorities will have little, if any, experience in permitting commercial and residential sources, and therefore will face a learning curve that will entail more time to take permitting action. In addition, we expect that in many cases PSD and title V permit applications for GHGs will receive comments from various stakeholders, from citizens groups to equipment vendors, who will seek to participate in the permit process, and responding and revising permits accordingly will add to the hours that the permitting authority will spend.

As a result, we raised the PSD permit hours for various steps in the permitting process, as described in the burden estimate document. While we continue to estimate that permitting authorities will expend, on average, 301 hours to issue a PSD permit to an industrial source, and that this would cost \$23,243, we now recognize that a permitting authority would expend 70 percent of that time or 210 hours, to permit a commercial or residential source, which would cost \$16,216. Similarly, for title V, while we continue to estimate that permitting authorities will expend, on average, 428 hours to issue a title V permit to an industrial source, and that this would cost \$19,688, we now recognize that a permitting authority would expend 50 percent of the time, or 214 hours, to permit a commercial or residential source, which would cost \$9,844.

We disagree with commenters who suggested that by basing our estimates on the numbers of newly constructing and modifying sources with high enough emissions to qualify as major emitting facilities, we failed to account for the costs of sources that seek "synthetic minor" permits to avoid PSD, and possibly title V, requirements. In fact, our methodology includes sources that might take such limits as newly-major sources for their GHG emissions; and therefore we count the full administrative burden associated with a PSD permit and a title V permit for those sources. In effect, we assume that such sources would go through PSD or title V permitting, rather than take "synthetic minor" limits. We take this approach because although we suspect that there may, in fact, be significant synthetic minor activity, we do not have data that would allow us to determine whether, and how many of, these sources will be able to adopt "synthetic

minor" limits or restrict their operations to obtain minor source permitting status. Nor do we have data on the amount of the administrative burden that would fall on any particular permitting authority to establish a "synthetic minor" limit, except that we understand that the amount varies widely across states. As a result, we opted to include these sources in our analysis as sources receiving a PSD or title V permit. Therefore, to the extent that synthetic minor activity occurs, our estimate would already have included the burden for that activity. In fact, our estimate would have overestimated the burden to the extent that a permitting authority would have less administrative costs to issuing a "synthetic minor" permit, as compared to a PSD or title V permit.

(3) Revised Burden Estimates at Statutory Thresholds Based on the revisions just described, we estimate that in all, if sources that emit GHGs become subject to PSD at the 100/250 tpy levels, permitting authorities across the country would face over \$1.5 billion in additional PSD permitting costs each year. This would represent an increase of 130 times the current annual burden hours under the NSR major source program for permitting authorities. The permitting authorities would need a total of almost 10,000 new FTEs to process PSD permits for GHG emissions.

In addition, we estimate that in all, if sources that emit GHGs become subject to title V at the 100 tpy level, permitting authorities across the country would incur about 1.4 billion additional work hours, which would cost \$63 billion. We estimate that most of this work would be done over a 3 year period, which would amount to 458 million in additional work hours, and \$21 billion in additional costs, on an annual basis over that 3-year period.

We also note that the survey of state and local permitting authorities described in the proposed rulemaking continues to shed light on the extent of the administrative burdens, including staffing, budget, and other associated resource needs, as projected by the permitting authorities. As noted previously, that survey concluded that application of the PSD requirements to GHG-emitting sources at the level of 100/250 tpy or more of actual emissions would, without additional FTEs, increase the average processing time for a PSD permit from one to 3 years. The survey further concluded that application of the title V requirements to GHG-emitting sources at the level of 100 tpy or more of actual emissions would, without additional FTEs, increase the average processing time for

a title V permit from 6 months to 10 years. As we noted at proposal, this survey assumed a ten-fold increase in the number of PSD permits and a 40-fold increase in the number of title V permits due to GHG-emitting sources, but those assumptions were severely underestimated because they were based on actual emissions. At proposal, our calculations, which were based on potential emissions, indicated a 140-fold increase in PSD permits and a more than 400-fold increase in title V permits. In this rulemaking, we recognize that even our estimates at proposal were severely underestimated. We now recognize that the number of PSD permits will be about twice what we estimated at proposal, and the average

processing time for both PSD and title V permits will be two or three times greater than what we estimated at proposal. The survey of state and local permitting authorities provided other useful information as well, including the fact that it would take the permitting authorities 2 years, on average, to hire the staff necessary to handle a ten-fold increase in PSD permits and a 40-fold increase in title V permits, and that 90 percent of their staff would need additional training in all aspects of permitting for GHG sources.

(4) Revised Estimates of Administrative Burdens at Various Threshold Levels

In order to determine the appropriate PSD and title V applicability level for

GHG sources, we not only estimated the burden at the statutory thresholds, as described previously, but we also estimated the number of sources, number of permitting actions, and amount of administrative burden at various applicability levels for both PSD and title V, based on the revised methodology described previously, that we used to estimate the administrative burdens of applying PSD and title V at the statutory levels. This information is summarized in Table V–1. Note that Table V–1 also includes, in the last column, the administrative burdens, described previously, associated with the 100/250 tpy thresholds.

TABLE V–1—COVERAGE AND BURDEN INFORMATION

	Current program ¹	“Anyway” source approach 75k major mod.	100k Major source 100k major mod.	100k Major source 75k major mod.	100k Major source 50k major mod.	50k Major source 50k major mod.	25k Major source 25k major mod.	100/250 Major, 100 mod.
Number of Major Sources	15,000	15,000	15,550	15,550	15,550	18,500	22,500	6,118,252.
Number of Newly Major GHG Sources.	N/A	0	550	550	550	3,500	7,500	6,105,913.
Number of PSD New Construction Actions.	240	240	242	242	242	243	250	19,889.
Number of PSD Modification Actions at Covered major sources.	448	448	468	1,363	2,257	2,354	9,645	62,284.
Permitting Authority Cost to Run PSD programs.	\$12M/yr	\$15M/yr	\$15M/yr	\$36M/yr	\$57M/yr	\$59M/yr	\$229M/yr ...	\$1.5B/yr.
Permitting Authority Work Hours to Run PSD programs ² .	150,795	185,195	192,055	461,450	730,544	764,781	2.97 M	19.7 M.
Permitting Authority Cost to Run Title V Programs.	\$62M/yr	\$63M/yr	\$67M/yr	\$69M/yr	\$70M/yr	\$88M/yr	\$126M/yr ...	\$21 B/yr.
Permitting Authority Work Hours to Run Title V Programs.	1.35 M	1.38 M	1.46 M	1.49 M	1.53 M	1.92 M	2.74 M	460 M.
Annual Total Cost to Run PSD and Title V Programs and percent increase in cost over current program.	\$74M/yr	\$78M/yr 5% increase (once states adopt).	\$82M/yr 11% increase.	\$105M/yr 42% increase.	\$127M/yr 72% increase.	\$147M/yr 99% increase.	\$355M/yr 380% increase.	\$22.5 B/yr 30,305% increase.
% GHG emissions covered ³ ...	0	65%	67%	67%	67%	70%	75%	78%.

Notes: (1) As explained in the preamble, “current program” figures for PSD permits also reflect NSR permits in nonattainment areas that we assume include a PSD component for at least one pollutant. (2) Number of FTEs may be calculated as work hours divided by 2,000 hours. (3) Percent of national GHG stationary source emissions emitted from sources that would be considered major for GHG emissions under each threshold scenario.

As described in the TSD, we considered several different major source/major modification threshold combinations. We chose the combinations to reflect representative, incremental steps along the possible range. Because it is time- and resource-intensive to develop estimates for a given step, we chose intervals that best reflect representative points within the range, given those time and resource constraints. Here, we discuss key observations about some of the

combinations that we assessed. As the table indicates, under the current PSD and title V programs, approximately 15,000 sources qualify as major PSD sources for at least one pollutant and therefore meet the applicability thresholds. Of these, approximately 668 sources are subject to PSD requirements each year for at least one pollutant—240 because they undertake new construction, and 448 because they undertake modifications. The permitting authorities’ administrative burdens for

the NSR program are 153,795 work hours, and \$12 million. For the title V program, the 15,000 sources are, for the most part already permitted, and therefore need revised permits as required and renewal permits on a 5-year schedule. The permitting authorities’ title V administrative burdens on an annual basis are 1,349,659 work hours and \$62 million.

The first threshold Table 1 describes—and which, as discussed later, we are adopting for Step 1—is the

“anyway” source approach. Under this approach, (i) PSD applies to the GHG emissions from projects that are subject to PSD anyway as new sources or major modifications due to their emissions of non-GHG pollutants and that result in an increase (or, in the case of modifications, a net increase) of at least 75,000 tpy CO₂e; and (ii) title V applies to what we will call “anyway” title V sources, that is, sources that are subject to title V anyway due to their emissions of non-GHG pollutants. Under this approach, the number of sources subject to PSD each year—including new construction and modifications—is the same as under the current program, but the permitting authorities will need to address GHG emissions as part of those permitting actions each year and, to do so, will require, each year, 34,400 additional workload hours costing an additional \$3 million. For title V, we estimate that the number of title V sources that require permitting actions will, on average, be the same each year, but permitting authorities will need to address GHG requirements for some of them; as a result, permitting authorities will need, each year, 27,468 additional work hours costing \$1 million in additional funding.

Another threshold described in Table V-1 is the one we are adopting under Step 2, as described later, under which (i) sources will be subject to PSD on account of their GHG emissions if they newly construct and emit at least 100,000 tpy CO₂e, or if they are existing sources that emit at least 100,000 tpy CO₂e of GHGs and make a modification that results in a net emissions increase of at least 75,000 tpy CO₂e; and (ii) existing sources will be subject to title V due to their GHG emissions if they emit 100,000 tpy CO₂e in GHG emissions. Under this approach, which we will call the 100,000/75,000 approach, we estimate that each year, compared to current levels, the permitting authorities will need to issue GHG permits to two additional sources that newly construct and to 915 additional sources that undertake modifications. Doing so will require 310,655 additional workload hours costing an additional \$24 million, compared to the current program. For title V, an additional 190 sources will require new title V permits each of the first 3 years, and the permitting authorities’ associated costs will be 141,322 work hours and \$7 million more than the current program.

The last approach we will describe here may be called the 50,000/50,000 approach, which, as discussed later, we adopt as the floor for thresholds during the first 6 years after promulgation.

Under this approach, (i) sources will be subject to PSD on account of their GHG emissions if they newly construct and emit at least 50,000 tpy CO₂e, or if they are existing sources that emit at least 50,000 tpy CO₂e of GHGs and make a modification that results in a net emissions increase of at least 50,000 tpy CO₂e; and (ii) existing sources will be subject to title V on account of their GHG emissions if they emit 50,000 tpy CO₂e in GHG emissions. Under this approach, each year, the permitting authorities will need to issue GHG permits to 3 additional sources that newly construct and 1,900 that undertake modifications above current permitting levels. Doing so will require 613,986 additional workload hours costing \$47 million, compared to the current program. For title V, an additional 1,189 sources will require new title V permits each of the first 3 years and the permitting authorities’ associated costs will be 568,017 work hours and \$26 million more than the current program.

We present the remaining entries in the table to illustrate how the cost and burden estimates vary with increasing or decreasing thresholds relative to those selected in this rule. These variations are important in understanding how alternative thresholds would compare to the ones selected. We also include entries reflecting the baseline (current program without GHG permitting) and the burdens if we immediately implemented the full statutory thresholds on January 2, 2011, without tailoring or streamlining.

3. “Absurd Results,” “Administrative Necessity,” and “One-Step-at-a-Time” Legal Doctrines

a. Introduction and Summary

Having described the factual underpinnings of our action, which are the costs to sources and administrative burdens to permitting authorities, we now describe the legal underpinnings. They involve the framework for analyzing agency-administered statutes, as established by the U.S. Supreme Court in *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837, 842–43 (1984). In this case, *Chevron* framework must take into account the “absurd results,” “administrative necessity,” and “one-step-at-a-time” legal doctrines. We believe that each of these doctrines provides independent support for our action, but in addition, the three doctrines are directly intertwined and can be considered in a comprehensive and interconnected manner. Moreover, although each of the three doctrines pre-

date the 1984 *Chevron* decision, in which the U.S. Supreme Court established the framework for construing agency-administered statutes, each fits appropriately into the *Chevron* framework.²⁴

To reiterate, for convenience, the statutory provisions at issue: Congress, through the definition of “major emitting facility,” applied the PSD program to include “any * * * source [that] emit[s], or ha[s] the potential to emit, one hundred [or, depending on the source category two hundred fifty] tons per year or more of any air pollutant.” CAA sections 165(a), 169(1). In addition, Congress, through the definition of “modification,” applied the PSD program to include “any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.” CAA sections 165(a), 169(2)(C), 111(a)(4). Similarly, Congress, through the definition of “major source,” specified that the title V program includes “any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant.” CAA sections 502(a), 501(2)(B), 302(j). EPA, through long-established regulatory action, in the case of PSD, and long-established guidance, in the case of title V, has interpreted these definitions narrowly so that they apply only with respect to air pollutants that are subject to regulation under the CAA.

Applying these definitions by their terms, as interpreted narrowly by EPA, to GHG sources at the present time would mean that the PSD and title V programs would apply to an extraordinarily large number of small sources, the sources would incur unduly high compliance costs, and permitting authorities would face overwhelming administrative burdens. As a result, we believe Congress did not intend for us to follow this literal reading, and instead, with this action, we chart a course for tailoring the applicability provisions of the PSD program and the title V program by phasing them in over time to the prescribed extent.

For our authority to take this action, we rely in part on the “absurd results” doctrine, because applying the PSD and title V requirements literally (as previously interpreted narrowly by

²⁴ Although we set out an analysis of how the three doctrines fit into the *Chevron* framework, we note that even if the doctrines are viewed independently of the *Chevron* framework, they support this action.

EPA) would not only be inconsistent with congressional intent concerning the applicability of the PSD and title V programs, but in fact would severely undermine congressional purpose for those programs. We also rely on the “administrative necessity” doctrine, which applies because construing the PSD and title V requirements literally (as previously interpreted narrowly by EPA) would render it impossible for permitting authorities to administer the PSD provisions. The tailoring approach we promulgate in this action is consistent with both doctrines. It is also consistent with a third doctrine, the “one-step-at-a-time” doctrine, which authorizes administrative agencies under certain circumstances to address mandates through phased action.

Our discussion of the legal bases for this rule is organized as follows: In this section V.B.3, we provide an overview of the three doctrines and describe how they fit into the *Chevron* framework for statutory construction. In section V.B.4, we discuss the PSD and title V programs, including each program’s relevant statutory provisions, legislative history, and regulatory history. In sections V.B.5 and V.B.6 we discuss the “absurd results” approach for PSD and title V, respectively, that we are finalizing in our action. In section V.B.7., we discuss additional rulemaking in which we may consider exempting certain categories of sources from PSD and title V under the “absurd results” doctrine. In section V.B.8, we discuss the legal and policy rationale for the phase-in schedule that we are adopting for applying PSD and title V to GHG sources. In section V.B.9 we discuss the “administrative necessity” approach for PSD and title V, respectively. In section V.B.10, we discuss the third legal basis for our action, the “one-step-at-a-time” doctrine.

b. The “Absurd Results” Doctrine

Turning first to the “absurd results” doctrine, we note at the outset that we discussed the doctrine at length in the notice of proposed rulemaking, and we incorporate by reference that discussion, although we make some refinements to that discussion in this preamble. The starting point for EPA’s interpretation of the PSD and title V applicability provisions and reliance on the “absurd results” doctrine is the familiar *Chevron* two-step analysis. We discuss this analysis in greater detail later, but in brief, in interpreting a statutory provision, an agency must, under *Chevron* Step 1, determine whether Congress’s intent on a particular question is clear; if so, then the agency must follow that intent. If the intent of

the provision is not clear, then the agency may, under Step 2, fashion a reasonable interpretation of the provision. *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837, 842–43 (1984).

The courts consider the best indicator of congressional intent to be the plain meaning of the statute. However, the U.S. Supreme Court has held that the literal meaning of a statutory provision is not conclusive “in the ‘rare cases [in which] the literal application of a statute will produce a result demonstrably at odds with the intentions of the drafters’ * * * [in which case] the intention of the drafters, rather than the strict language, controls.” *United States v. Ron Pair Enterprises*, 489 U.S. 235, 242 (1989). This doctrine of statutory interpretation may be termed the “absurd results” doctrine.

Although, as just noted, the U.S. Supreme Court has described the “absurd results” cases as “rare,” in that case the Court seemed to be referring to the small percentage of statutory-construction cases that are decided on the basis of the doctrine. The DC Circuit, in surveying the doctrine over more than a century of jurisprudence, characterized the body of law in absolute numbers as comprising “legions of court decisions.” *In re Franklyn C. Nofziger*, 925 F.2d 428, 434 (DC Cir. 1991). Indeed, there are dozens of cases, dating from within the past several years to well into the 19th century,²⁵ in which the U.S. Supreme Court has applied the “absurd results” doctrine to avoid the literal application of a statute, or if not so holding, has nevertheless clearly acknowledged the validity of the doctrine. Some of the more recent of these cases include: *Logan v. United States*, 552 U.S. 23, 36–37 (2007) (“[s]tatutory terms, we have held, may be interpreted against their literal meaning where the words ‘could

²⁵ For early cases in which the U.S. Supreme Court applied the “absurd results” doctrine, see *Holy Trinity Church v. U.S.*, 143 U.S. 457, 516–17 (1892) (“any alien” does not include a foreign pastor; Court stated, “It is a familiar rule, that a thing may be within the letter of the statute and yet not within the statute, because not within its spirit, nor within the intention of its makers * * * . If a literal construction of the words be absurd, the Act must be construed as to avoid the absurdity”); *Chew Heong v. United States*, 112 U.S. 536, 555 (1884) (rejecting a literal interpretation of treaty that would have prevented the re-entry of a person into the U.S. upon the ground that he did not possess a certificate which did not exist prior to his departure, and which could not possibly have been issued); *Heyenfeldt v. Daney Gold Mining Co.*, 93 U.S. 634, 638 (1877) (statutory language expressly referred to past land sales and dispositions, “but evidently they were not employed in this sense, for no lands in Nevada had been sold or disposed of by any act of Congress,” and the language of the statute “could not * * * apply to past sales or dispositions, and, to have any effect at all, must be held to apply to the future”).

not conceivably have been intended to apply’ to the case at hand [citation omitted]”); *Nixon v. Missouri Municipal League*, 541 U.S. 125, 132–33 (2004) (“any entity” includes private but not public entities); *Raygor v. Regents of Univ. of Minn.*, 534 U.S. 533, 542–45 (2002) (“implying a narrow interpretation of * * * ‘any claim asserted’ so as to exclude certain claims dismissed on Eleventh Amendment grounds”); *United States v. X-Citement Video, Inc.*, 513 U.S. 64, 69 (1994) (rejecting a literal interpretation of the statutory term “knowingly” on grounds that Congress could not have intended the “positively absurd” results that some applications of such an interpretation would produce, “[f]or instance, a retail druggist who returns an uninspected roll of developed film to a customer ‘knowingly distributes’ a visual depiction and would be criminally liable if it were later discovered that the visual depiction contained images of children engaged in sexually explicit conduct”); *Rowland v. Cal. Men’s Colony*, 506 U.S. 194, 200 (1993) (finding that an artificial entity such as an association is not a “person” under the statute, and describing the absurdity doctrine as a “common mandate of statutory construction”); *United States v. Ron Pair Enterprises*, 489 U.S. 235, 242 (1989) (the plain meaning of a statutory provision is not conclusive “in the ‘rare cases [in which] the literal application of a statute will produce a result demonstrably at odds with the intentions of the drafters’ * * * [in which case] the intention of the drafters, rather than the strict language, controls”); *Green v. Bock Laundry Machine Company*, 490 U.S. 504 (1989) (provision in Federal Rule of Evidence that protects “the defendant” against potentially prejudicial evidence, but not the plaintiff, refers to only criminal, and not civil, defendants); *Public Citizen v. United States Dep’t of Justice*, 491 U.S. 440, 453–54 (1989) (rejecting a broad, straightforward reading of the term “utilize,” on grounds that a literal reading would appear to require the absurd result that all of FACA’s restrictions apply if a President consults with his own political party before picking his Cabinet, and such a reading “was unmistakably not Congress’ intention”); *Watt v. Alaska*, 451 U.S. 259, 266 (1981) (rejecting reliance on plain statutory language and concluding that the term “minerals” in section 401(a) of the Wildlife Refuge Revenue Sharing Act applies only to minerals on acquired refuge lands; stating “[t]he circumstances of the enactment of particular legislation may persuade a

court that Congress did not intend words of common meaning to have their literal effect”); *Train v. Colorado Public Interest Research Group, Inc.*, 426 U.S. 1, 23–24 (1976) (prohibition in Federal Water Pollution Control Act against discharging into navigable waters “pollutants,” which are defined to include “radioactive materials,” does not apply to three specific types of radioactive materials); *Jackson v. Lykes Bros. S.S. Co.*, 386 U.S. 731, 735 (1967) (refusing to distinguish between a longshoreman hired by “an independent stevedore company” and one hired by “the shipowner * * * to do exactly the same kind of work,” despite the clear terms of the Act, and stating: “[w]e cannot hold that Congress intended any such incongruous, absurd, and unjust result in passing this Act,” when the Act was “designed to provide equal justice to every longshoreman similarly situated”); *Lynch v. Overholser*, 369 U.S. 705, 710, (1962) (statutory construction is not confined to the “bare words of a statute”); *United States v. Bryan*, 339 U.S. 323, 338 (1950) (“Despite the fact that the literal language would encompass testimony elicited by the House Committee in its questioning of respondent relative to the production of the records of the association, the Court will not reach that result if it is contrary to the congressional intent and leads to absurd conclusions. And we are clearly of the opinion that the congressional purpose would be frustrated if the words, “in any criminal proceeding,” were read to include a prosecution for willful default under R.S. § 102.”).²⁶

The DC Circuit has also handed down numerous decisions that applied the absurd results doctrine to avoid a literal interpretation or application of statutory

provisions or that have acknowledged the doctrine. Some of the most recent ones include: *Arkansas Dairy Cooperative Ass’n, Inc., v. U.S. Dep’t of Agriculture*, 573 F.3d 815 (DC Cir. 2009) (rejecting the canon of construction that presumes that Congress is aware of existing law pertinent to the legislation that it enacts, when in this case, the presumption that Congress was aware of the Departments definition of “hearing” would lead to “the absurd result that Congress intended to impose a requirement with which the Secretary could not comply,” stating: “Courts, ‘in interpreting the words of a statute, [have] some scope for adopting a restricted rather than a literal or usual meaning of its words where acceptance of that meaning would lead to absurd results * * * or would thwart the obvious purpose of the statute * * *’” (quoting *In re Trans Alaska Pipeline Rate Cases*, 436 U.S. 631, (1978)); *Buffalo Crushed Stone, Inc. v. Surface Transportation Board*, 194 F.3d 125, 129–30 (DC Cir. 1999) (regulation of Surface Transportation Board providing that if a notice of exemption “contains false or misleading information, the use of the exemption is void *ab initio*” does not apply to a notice containing false information when declaring the notice void *ab initio* would undermine the goals of the governing statute; a conflict between the “literal application of statutory language” and maintaining the integrity of the regulatory scheme should be resolved by construing the text in accordance with its purpose); *Mova Pharm. Corp. v. Shalala*, 140 F.3d 1060, 1068–69 (DC Cir. 1998) (as discussed later, describes the “absurd results” doctrine in the context of the *Chevron* framework for statutory construction; invalidates a Food and Drug Administration’s (FDA) regulation designed to remedy what the FDA described as the absurd result of a literal application of the statutory provisions governing FDA approval of successive generic drug applications, on grounds that “[i]n effect, the FDA has embarked upon an adventurous transplant operation in response to blemishes in the statute that could have been alleviated with more modest corrective surgery,” states that “[t]he rule that statutes are to be read to avoid absurd results allows an agency to establish that seemingly clear statutory language does not reflect the “unambiguously expressed intent of Congress,” *Chevron*, 467 U.S. at 842, and thus to overcome the first step of the *Chevron* analysis”); *Environmental Defense Fund v. EPA*, 82 F.3d 451, 468–69 (DC Cir. 1996) (although Act requires that a federal

action conform to the SIP that is currently in place, EPA may instead require conformity to a revised implementation plan that state commits to develop; “[t]his is one of those rare cases * * * [that] requires a more flexible, purpose-oriented interpretation if we are to avoid ‘absurd or futile results.’”); *American Water Works Ass’n v. EPA*, 40 F.3d 1266, 1271 (DC Cir. 1994) (holding that EPA’s interpretation of the term “feasible” so as to require a treatment technique instead of a maximum contaminant level (MCL) for lead is reasonable; the court stated: “Indeed, where a literal reading of a statutory term would lead to absurd results, the term simply ‘has no plain meaning * * * and is the proper subject of construction by the EPA and the courts.’ If the meaning of ‘feasible’ suggested by the NRDC is indeed its plain meaning, then this is such a case; for it could lead to a result squarely at odds with the purpose of the Safe Drinking Water Act.” (quoting *Chem. Mfrs. Ass’n v. Natural Res. Def. Council, Inc.*, 470 U.S. 116, 126 (1985)) (citation omitted); *In re Nofziger*, 925 F.2d 428, 434–35 (DC Cir. 1991) (provision authorizing payment of attorney fees to the subject of an investigation conducted by an independent counsel of the Department of Justice only if “no indictment is brought” against such individual does not preclude payment of attorney fees when an indictment is brought but is determined to be invalid).

c. The “Administrative Necessity” Doctrine

In the proposed rulemaking, we also described in detail the “administrative necessity” doctrine, 74 FR 55311 col. 3 to 55318 col. 3, and we incorporate that discussion by reference into this notice. Under this doctrine, if a statutory provision, however clear on its face, is impossible for the agency to administer, then the agency is not required to follow the literal requirements, and instead, the agency may adjust the requirements in as refined a manner as possible to assure that the requirements are administrable, while still achieving Congress’s overall intent. The DC Circuit set out the doctrine of “administrative necessity” in a line of cases that most prominently includes *Alabama Power v. Costle*, 636 F.2d 323 (DC Cir. 1980). The Court cited the doctrine most recently in *New York v. EPA*, 443 F.3d 880, 884, 888 (DC Cir. 2006).

As we stated in the proposed rulemaking, “We believe that the “administrative necessity” case law establishes a three-step process under which an administrative agency may, under the appropriate circumstances, in

²⁶ For other U.S. Supreme Court cases, see *Utah Junk Co. v. Porter*, 328 U.S. 39, 44 (1946) (“literalness may strangle meaning”); *Markham v. Cabell*, 326 U.S. 404, 409 (1945) (“The policy as well as the letter of the law is a guide to decision.”); *United States v. American Trucking Associations, Inc.* 310 U.S. 534 (1940) (the term “employees” in the Federal Motor Carrier Act, is limited to employees whose activities affect safety); *C.V. Sorrells v. U.S.*, 287 U.S. 435, 446–49 (1932) (provisions of National Prohibition Act that criminalize possessing and selling liquor do not apply if defendant is entrapped; Court declines to apply the “letter of the statute” because doing so “in the circumstances under consideration is foreign to its purpose”); *United States v. Katz*, 271 U.S. 354, 362 (1926) (holding that the statutory words “no person” refer only to persons authorized under other provisions of the Act to traffic alcohol, thus rejecting a literal application of general terms descriptive of a class of persons made subject to a criminal statute); *Hawaii v. Mankichi*, 190 U.S. 197, 212–14 (1903) (refusing to adopt a literal application of the “Newlands resolution” which would have entitled every criminal in the State of Hawaii convicted of an offense between 1898–1900 to be set at large, as “surely such a result could not have been within the contemplation of Congress”).

effect revise statutory requirements that the agency demonstrates are impossible to administer so that they are administrable.” 74 FR 55315 col. 1. Specifically:

[T]he three steps are as follows: When an agency has identified what it believes may be insurmountable burdens in administering a statutory requirement, the first step the agency must take is to evaluate how it could streamline administration as much as possible, while remaining within the confines of the statutory requirements. The second step is that the agency must determine whether it can justifiably conclude that even after whatever streamlining of administration of statutory requirements (consistent with those statutory requirements) it conducts, the remaining administrative tasks are impossible for the agency because they are beyond its resources, e.g., beyond the capacities of its personnel and funding. If the agency concludes with justification that it would be impossible to administer the statutory requirements, as streamlined, then the agency may take the third step, which is to phase in or otherwise adjust the requirements so that they are administrable. However, the agency must do so in a manner that is as refined as possible so that the agency may continue to implement as fully as possible Congressional intent.

74 FR 55315 cols. 1–2.

It should also be noted that we believe the administrative burdens encountered by the state and local permitting authorities are fully relevant under the “administrative necessity” doctrine. Although the case law that discusses the doctrine focuses on federal agencies (*see* 74 FR 55312–14), under the CAA, state and local agencies are EPA’s partners in implementing provisions of the CAA, and have primary responsibility for implementing the PSD program. They generally adopt EPA’s PSD requirements in their SIPs, as required under CAA section 110(a)(2)(C); and they generally adopt EPA’s title V requirements in their title V programs, as required under CAA section 502(d). They issue the PSD and title V permits and are responsible in the first instance for enforcing the terms of the permits. In all these respects, the law that the state and local permitting authorities administer is both federal and state law. Under certain circumstances, EPA may become responsible for permit issuance and enforcement in the first instance, but even then, EPA may, and frequently has, delegated those duties to a state, in which case, the state implements federal law directly. Thus, although the PSD and title V programs are federal requirements, for the most part, it is the states that implement those programs. For this reason, the administrative burdens that the states face in

implementing the programs are relevant in determining the applicability of the “administrative necessity” doctrine.

d. “One-Step-at-a-Time” Doctrine

In addition to the “absurd results” and “administrative necessity” doctrines, another judicial doctrine supports at least part of EPA’s Tailoring Rule, and that is the doctrine that agencies may implement statutory mandates one step at a time, which we will call the “one-step-at-a-time” doctrine. In the notice of proposed rulemaking, we also described this doctrine and recent case law applying it. 74 FR 55319 col. 1–3. As we noted, that the U.S. Supreme Court recently described the doctrine in *Massachusetts v. EPA*, 549 U.S. 497, 524 (2007), as follows: “Agencies, like legislatures, do not generally resolve massive problems in one fell regulatory swoop;” and instead they may permissibly implement such regulatory programs over time, “refining their preferred approach as circumstances change and as they develop a more nuanced understanding of how best to proceed.” We assume familiarity with our discussion in the proposal, but we expand upon it here to review the case law in greater detail and to highlight certain components of the doctrine that are particularly relevant to the Tailoring Rule. The roots of the doctrine go back at least to the DC Circuit’s 1979 decision in *United States Brewers Association, Inc. v. EPA*, 600 F.2d 974 (DC Cir. 1979). There, the Court considered a challenge to EPA’s guidelines for managing beverage containers, which EPA was required to promulgate under the Resource Conservation and Recovery Act of 1976 (RCRA). RCRA gave EPA one year to promulgate the guidelines. EPA promulgated a partial set of guidelines, started two others, and was challenged before the year was out by petitioners who objected to the initial guideline, saying it fell short of the statutory mandate. The Court upheld the initial guideline, stating: “Under these circumstances we think the question of whether the Agency has fully satisfied the mandate of the statute is not fit for judicial review at this time, when the Agency, still well within the one-year period granted by statute, is deeply involved in the process of formulating rules designed to carry out the congressional mandate. The Agency might properly take one step at a time.” *States Brewers Association, Inc. v. EPA*, 600 F.2d at 982.

The Court addressed the doctrine at greater length in *National Association of Broadcasters v. FCC*, 740 F.2d 1190, 1209–14 (DC Cir. 1984). There, the Court noted that under certain statutory

schemes, step-by-step agency action might not be authorized; but the Court emphasized that when it is authorized, it may offer significant benefits; and the Court went on to delineate some of the circumstances under which its use is justified. In that case, the Court held that Federal Communications Commission (FCC) acted reasonably in making a spectrum allocation decision that granted direct broadcast satellite service priority use of a gigahertz (GHz) band in 5-years time, and—although acknowledging that fixed service users that were, at that time, using that band, would have to relocate to other bands—in postponing the details of the fixed service relocation to future proceedings. The Court described in some detail “[t]he circumstances under which * * * [an] agency may defer resolution of problems raised in a rulemaking,” as follows:

The requisite judgment is in essence a pragmatic one. In an ideal world, of course, agencies would act only after comprehensive consideration of how all available alternatives comported with a well-defined policymaking objective, and in some circumstances, statutes indeed mandate that agencies proceed by only such a course * * *. But administrative action generally occurs against a shifting background in which facts, predictions, and policies are in flux and in which an agency would be paralyzed if all the necessary answers had to be in before any action at all could be taken * * *. We have therefore recognized the reasonableness of [an agency’s] decision to engage in incremental rulemaking and to defer resolution of issues raised in a rulemaking even when those issues are “related” to the main ones being considered * * *. At the same time, [an agency] cannot ‘restructure [an] entire industry on a piecemeal basis’ through a rule that utterly fails to consider how the likely future resolution of crucial issues will affect the rule’s rationale * * *.

Drawing a line between the permissible and the impermissible in this area will generally raise two questions. First the agency will likely have made some estimation, based upon evolving economic and technological conditions, as to the nature and magnitude of the problem it will have to confront when it comes to resolve the postponed issue. With regard to this aspect of the agency’s decision, as long as the agency’s predictions about the course of future events are plausible and flow from the factual record compiled, a reviewing court should accept the agency’s estimation * * *. Second, once the nature and magnitude of the unresolved issue is determined, the relevant question is whether it was reasonable, in the context of the decisions made in the proceeding under review, for the agency to have deferred the issue to the future. With respect to that question, postponement will be most easily justified when an agency acts against a background of rapid technical and social change and when

the agency's initial decision as a practical matter is reversible should the future proceedings yield drastically unexpected results. In contrast, an incremental approach to agency decision making is least justified when small errors in predictive judgments can have catastrophic effects on the public welfare or when future proceedings are likely to be systematically defective in taking into account certain relevant interests * * *.

740 F.2d at 1210–11 (citations omitted).

In *City of Las Vegas v. Lujan*, 891 F.2d 927 (DC Cir. 1989), the Court suggested that one component of upholding partial agency compliance with a statutory directive is evidence that the agency was on track for full compliance. There, the Court upheld the Department of Interior's decision to list the population of desert tortoises living north and west of the Colorado River (the "Mojave" population) as endangered species, but not the nearby population living south and east of the river (the "Sonoran" population). The agency explained that the Mojave population faced certain threats that the Sonoran population did not, and the Court found nothing to fault in that reasoning. The Court added: "Since agencies have great discretion to treat a problem partially, we would not strike down the listing if it were a first step toward a complete solution, even if we thought it 'should' have covered both the Mojave and Sonoran populations." *City of Las Vegas v. Lujan*, 891 F.2d 927, 935 (DC Cir. 1989) (footnote omitted).

In *Grand Canyon Air Tour Coalition v. F.A.A.*, 154 F.3d 455 (DC Cir. 1998), the DC Circuit added another component to the "one-step-at-a-time" doctrine: While reiterating that "ordinarily, agencies have wide latitude to attack a regulatory problem in phases and that a phased attack often has substantial benefits," *id.* at 471, the Court went on to uphold partial agency action even when that action was long-delayed. There, the relevant statute was the Overflights Act, which required the Federal Aviation Administration (FAA) to reduce aircraft noise from sightseeing tours in Grand Canyon National Park, and established the goal of "substantial restoration of natural quiet and experience of the park." The statute required the agency to develop a plan to implement the statutory requirements within 120 days after enactment, and report to Congress within 2 years after the date of the plan as to the plan's success. In fact, the FAA did not develop, through rulemaking, a plan until ten years after enactment, and when it did, it acknowledged that the plan was only a partial one, and that it would need two more rules and another ten years to meet the statutory goal of

substantial restoration. Although recognizing that the Overflights Act did not establish an explicit timetable for meeting the statutory goal, the Court stated that "[t]he language of the Overflights Act does manifest a congressional concern with expeditious agency action," and described the agency's action variously as "tardy," "undeniably slow," and "slow and faltering." *Id.* at 476–77. Even so, the Court upheld the FAA's action against different challenges from appellants and intervenors that (i) the agency acted unreasonably in not promulgating a complete plan to meet the statutory goal, instead of promulgating just the first step; and (ii) the agency acted unreasonably in not waiting until it had a complete plan before promulgating the first step. The Court stated: "We agree that it would be arbitrary and capricious for an agency simply to thumb its nose at Congress and say—without any explanation—that it simply does not intend to achieve a congressional goal on any timetable at all * * *," but went on to emphasize that the FAA's rule was the first of three that the agency assured would achieve the statutory goal. The Court cited *City of Las Vegas v. Lujan*, discussed previously, for the proposition that "a court will not strike down agency action 'if it were a first step toward a complete solution.'" *Grand Canyon Air Tour Coalition v. F.A.A.*, 154 F.3d 455, 477–78 (DC Cir. 1998).²⁷

e. Consistency of Doctrines With *Chevron* Framework

Although the formation of the "absurd results," "administrative necessity," and "one-step-at-a-time" doctrines pre-date the *Chevron* two-step analysis for construing statutes that Congress has authorized an agency to administer, we believe that the doctrines can be considered very much a part of that analysis, and courts have continued to apply them post-*Chevron*. Under *Chevron* Step 1, an agency must determine whether "Congress has directly spoken to the precise question at issue." If so, "the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress." However, if "the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based

on a permissible construction of the statute."

Chevron U.S.A. Inc. v. NRDC, 467 U.S. 837, 842–42 (1984).

Thus, Step 1 under *Chevron* calls for determining congressional intent for the relevant statutory directive on the specific issue presented. To determine Congress's intent, the agency must look first to the statutory terms in question, and generally interpret them according to their literal meaning, within the overall statutory context, and perhaps with reference to the legislative history. If the literal meaning of the statutory requirements is clear then, absent indications to the contrary, the agency must take it to indicate congressional intent and must implement it. Even if the literal meaning of the statutory requirements is not clear, if the agency can otherwise find indications of clear congressional intent, such as in the legislative history, then the agency must implement that congressional intent.

The DC Circuit has indicated that the "absurd results" doctrine fits into the *Chevron* Step 1 analysis in the following way: Recall that in the cases in which the courts have invoked this doctrine, the literal meaning of the statutory requirements has been clear, but has led to absurd results. This can occur when the literal meaning, when applied to the specific question, conflicts with other statutory provisions, contradicts congressional purpose as found in the legislative history—and, in particular, undermines congressional purpose—or otherwise produces results so illogical or otherwise contrary to sensible public policy as to be beyond anything Congress would reasonably have intended. See *United States v. Ron Pair Enterprises*, 489 U.S. 235, 242–43 (1989); *Griffin v. Oceanic Contractors, Inc.*, 458 U.S. 564, 571 (1982).

Under these circumstances, the agency must not take the literal meaning to indicate congressional intent. As the DC Circuit has explained, "where a literal reading of a statutory term would lead to absurd results, the term 'simply has no plain meaning * * * and is the proper subject of construction by the EPA and the court.'" *American Water Works Assn v. EPA*, 40 F.3d 1266, 1271 (DC Cir. 1994) (quoting *Chemical Manufacturers' Association v. NRDC*, 470 U.S. 116, 126 (1985)). Under these circumstances, if the agency can find other indications of clear congressional intent, then the agency must implement that intent. See *United States v. Ron Pair Enterprises*, 489 U.S. 235, 242–43 (1989). This may mean implementing the statutory terms, albeit not in accordance with their literal meaning,

²⁷ For other cases, see *Arizona Public Service Co. v. EPA*, 562 F.3d 1116, 1125–26 (10th Cir. 2009); *General American Transp. Corp. v. ICC*, 872 F.2d 1048, 1058 (DC Cir. 1989); *Hazardous Waste Treatment Council v. EPA*, 861 F.2d 277, 287 (DC Cir. 1988); *Western Union International, Inc. v. FCC*, 725 F.2d 732, 754 (DC Cir. 1984).

but in a way that achieves a result that is as close as possible to congressional intent. As the DC Circuit said in *Mova Pharm. Corp. v. Shalala*, 140 F.3d 1060 (DC Cir. 1998):

The rule that statutes are to be read to avoid absurd results allows an agency to establish that seemingly clear statutory language does not reflect the “unambiguously expressed intent of Congress.” * * * and thus to overcome the first step of the *Chevron* analysis. But the agency does not thereby obtain a license to rewrite the statute. When the agency concludes that a literal reading of a statute would thwart the purposes of Congress, it may deviate no further from the statute than is needed to protect congressional intent * * *. [T]he agency might be able to show that there are multiple ways of avoiding a statutory anomaly, all equally consistent with the intentions of the statute’s drafters * * *. In such a case, we would move to the second stage of the *Chevron* analysis, and ask whether the agency’s choice between these options was “based on a permissible construction of the statute.” Otherwise, however, our review of the agency’s deviation from the statutory text will occur under the first step of the *Chevron* analysis, in which we do not defer to the agency’s interpretation of the statute.

Id. at 1068 (quoting *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837, 842, 843 (1984) (citations omitted)).

The “administrative necessity” doctrine is not as well developed as the “absurd results” doctrine, so that the courts have not had occasion to explicitly describe how the doctrine fits into the *Chevron* analytical framework. However, we think that a reasonable approach, in line with the DC Circuit’s approach to the “absurd results” doctrine as just described, is as follows: Recall that under the “administrative necessity” doctrine, an agency is not required to implement a statutory provision in accordance with the literal requirements when doing so would be impossible, but the agency must nevertheless implement the provision as fully as possible. Placed in the context of the *Chevron* framework, we think that that the “administrative necessity” doctrine is based on the premise that inherent in the statutory design is the presumption that Congress does not intend to impose an impossible burden on an administrative agency. See *Alabama Power v. Costle*, 636 F.2d 323, 357 (DC Cir. 1980) (describing the “administrative necessity” approach as one of the “limited grounds for the creation of exemptions [that] are inherent in the administrative process, and their unavailability under a statutory scheme should not be presumed, save in the face of the most unambiguous demonstration of congressional intent to foreclose them”).

Therefore, if the literal meaning of a statutory directive would impose on an agency an impossible administrative burden, then that literal meaning should not be considered to be indicative of congressional intent. Rather, congressional intent should be considered to achieve as much of the statutory directive as possible. As a result, the agency must adopt an approach that implements the statutory directive as fully as possible. This is consistent with the DC Circuit’s holding in *Mova Pharm. Corp.* that if congressional intent is clear, but the plain meaning of a statute does not express that intent, then the agency must, under *Chevron* Step 1, select an interpretation that most closely approximates congressional intent. *Mova Pharm. Corp.*, 140 F.3d at 1068.²⁸

The “one-step-at-a-time” doctrine fits into the *Chevron* framework in much the same manner that the “administrative necessity” doctrine does. That is, inherent in the statutory design is the presumption that Congress intended an agency, under certain circumstances, to implement the statutory requirements in a one-step-at-a-time fashion, as long as the agency stays on a path towards full implementation.

Under all of the circumstances described previously, congressional intent is clear—whether it is indicated by the plain language or otherwise—and as a result, the agency must follow that intent under *Chevron* Step 1. On the other hand, the agency may determine that congressional intent on the specific issue is not clear. In these cases, the agencies should proceed to *Chevron* Step 2 and select an interpretation or an application that is a permissible construction of the statute. This situation generally occurs when the statutory provisions are ambiguous or silent as to the specific issue, and there are no other indications of clear congressional intent. In addition, in some cases in which the literal meaning of the statutory provision, when applied to the specific question, leads to an absurd result—and, therefore, the statutory provision should be considered not to have a plain meaning—there may be no other indications of clear congressional intent. Under all these circumstances, the agency is authorized, under *Chevron* Step 2, to develop and implement a construction of the statute that the

courts will uphold as long as it is reasonable.

As noted previously, the DC Circuit, has pointed out that this situation may also occur when the literal language leads to an absurd result, and, in attempting to implement congressional intent, the agency is “able to show that there are multiple ways of avoiding a statutory anomaly, all equally consistent with the intentions of the statute’s drafters * * *. In such a case, we would move to the second stage of the *Chevron* analysis, and ask whether the agency’s choice between these options was ‘based on a permissible construction of the statute.’” *Mova Pharm. Corp.*, 140 F.3d at 1068. As the U.S. Supreme Court has recently said, although in a context different than “absurd results,” “In the end, the interpretation applied by EPA ‘governs if it is a reasonable interpretation of the statute—not necessarily the only possible * * * interpretation, nor even the interpretation deemed most reasonable by the courts.’” *Entergy Corp. v. Riverkeeper, Inc.*, 129 S.Ct. 1498, 1505 (2009).

As a related matter, although the courts have described *Chevron* Step 2 as requiring that the agency’s policy be “a permissible construction of the statute,” see *Mova Pharm. Corp.*, 140 F.3d at 1068 (quoting *Chevron*, 467 U.S. at 842–43), if the statutory requirements cannot be read literally because doing so would produce “absurd results,” then the agency’s policy need not be completely consistent with those particular requirements. The policy must still, in order to be upheld, be consistent with Congress’s actions, but those actions should be considered to afford the agency broad discretion considering that both the statutory terms cannot be considered dispositive and underlying congressional intent is not clear. As the U.S. Supreme Court has recently said, although in a context different than “absurd results,” “In the end, the interpretation applied by the agency governs if it is a reasonable interpretation of the statute—not necessarily the only possible * * * interpretation, nor even the interpretation deemed most reasonable by the courts.” *Entergy Corp. v. Riverkeeper, Inc.*, 129 S.Ct. 1498, 1505 (2009).

There is another aspect of the “administrative necessity” doctrine worth noting in this context: The doctrine applies when (i) a literal application of the statutory directive to the case at hand is impossible for the agency to administer; and (ii) even so, either Congress clearly intended the statutory directive to apply to the case

²⁸ We recognize that we described the relationship between the *Chevron* framework and the “administrative necessity” doctrine somewhat differently in the proposal, 74 FR 55312, and that, after further analysis, we are refining our view of that relationship as described previously.

at hand or, if Congress did not clearly intend that, then the agency reasonably construes the statute to apply the statutory directive to the case at hand. In contrast, if Congress did not intend the statutory directive to apply to the case at hand, or if congressional intent is uncertain and the agency considers another approach to be reasonable, then the “administrative necessity” doctrine would not apply. As a result, the agency would not be required to implement the statutory directive to the case at hand at all, much less in a more administrable fashion.

f. Interconnectedness of the Legal Doctrines

Although we believe that each of the “absurd results,” “administrative necessity,” and “one-step-at-a-time” doctrines provide independent support for our action, we also believe that in this case, the three doctrines are intertwined and form a comprehensive basis for EPA’s tailoring approach. As just discussed, each of the three doctrines is tied into the *Chevron* analytical framework because each is designed to give effect to underlying intent. As discussed previously, each of the three doctrines comes into play in this case because a literal reading of the PSD and title V applicability provisions results in insurmountable administrative burdens. Those insurmountable administrative burdens—along with the undue costs to sources—must be considered “absurd results” that would undermine congressional purpose for the PSD and title V programs. Under the “absurd results” doctrine, EPA is authorized not to implement the applicability provisions literally—that is, not to implement them as applying on the January 2, 2011 date that PSD and title V are triggered to all GHG sources at or above the statutory thresholds—but instead to tailor them in a manner consistent with congressional intent. That means applying the PSD and title V requirements through a phase-in approach to as many sources as possible and as quickly as possible, starting with the largest sources, as EPA does with this Tailoring Rule,²⁹ at least to a certain point. By the same token, the insurmountable administrative burdens bring into play the “administrative necessity” doctrine, under which EPA is, again, authorized not to implement the applicability provisions literally, but

instead to apply them in a manner consistent with administrative resources. This also means phasing them in through the approach in the Tailoring Rule. Finally, the “one-step-at-a-time” doctrine, which authorizes incremental action by agencies to implement statutory requirements under certain circumstances, provides further support for the phased tailoring approach in the Tailoring Rule.

g. Application of Chevron Approach

The *Chevron* analytical approach, and the three legal doctrines at issue here, apply to this action in the following manner: To reiterate, for convenience, the statutory provisions at issue: Congress, through the definition of “major emitting facility,” applied the PSD program to include (i) “any * * * stationary sources of air pollutants which emit or have the potential to emit, one hundred [or, depending on the source category, two hundred fifty] tons per year or more of any air pollutant,” CAA sections 165(a), 169(1); and (ii) and such sources that undertake a physical or operational change that “increases the amount of any air pollutant emitted” by such sources, CAA sections 165(a), 169(2)(C), 111(a)(4).³⁰ Similarly, Congress, through the definition of “major source,” specified that the title V program includes “any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant.” CAA sections 502(a), 501(2)(B), 302(j). EPA, through long-established regulatory action, in the case of PSD, and long-established interpretation, in the case of title V, has interpreted these definitions so that they apply only with respect to air pollutants that are subject to regulation under the CAA.

For each of these applicability provisions, the approach under *Chevron* is as follows: Under *Chevron* Step 1, we must determine whether Congress expressed an intention on the specific question, which is whether the PSD or title V applicability provisions apply to GHG sources. Said differently, the specific question is whether, in the case of PSD, Congress intended that the definitions of “major emitting facility” and “modification” apply, respectively, to all GHG sources that emit at least 100

or 250 tpy or GHGs and to all physical or operational changes by major emitting facilities that “increase[] the amount” of GHGs; and, in the case of title V, whether the definition of “major source” applies to all GHG sources that emit at least 100 tpy GHGs.

To determine intent, we must first examine the terms of the statute in light of their literal meaning. Here, the literal reading of each provision covers GHG sources. For PSD, a GHG source that emits at least 100 or 250 tpy GHGs literally qualifies as “stationary source [] of air pollutants which emit[s] or ha[s] the potential to emit, one hundred [or two hundred fifty] tons per year or more of any air pollutant [subject to regulation under the CAA].” CAA section 169(1). For modifications, a physical or operational change that increases the amount of GHG emissions qualifies as a “modification” because it “increases the amount of any air pollutant emitted” by the source. Similarly, for title V, a GHG source that emits at least 100 tpy GHGs literally qualifies as “any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant [subject to regulation under the CAA].” CAA sections 502(a), 501(2)(B), 302(j).

Although each definition is clear that it applies to GHG sources as a general matter, applying each definition in accordance with its literal meaning to all GHG sources at the specified levels of emissions and at the present time—in advance of the development of streamlining methods and greater permitting authority expertise and resources—would create undue costs for sources and impossible administrative burdens for permitting authorities. These results are not consistent with other provisions of the PSD and title V requirements, and are inconsistent with—and, indeed, undermine—congressional purposes for the PSD and title V provisions. Accordingly, under the “absurd results” doctrine, neither the PSD definition of “major emitting facility” nor the title V definition of “major source,” should be applied literally to all GHG sources, and therefore none should be considered to have a literal meaning with respect to its application to all GHG sources.

In analyzing the provisions of each definition more closely, we believe that each has four terms, any one of which could be considered not to have its literal meaning, in this respect. Specifically, each provision includes (i) The term “any * * * source,” or “a stationary source,” and that term could be considered not to refer literally to all

²⁹ As discussed later, EPA may, in future rulemaking, make a final determination that under the “absurd results” doctrine, Congress did not intend for EPA to apply PSD to very small sources, that is, those, with emissions at or near the 100/250 tpy statutory levels.

³⁰ A physical or operational change is treated as a “modification” that is subject to PSD if it either “increases the amount of any air pollutant emitted” by the source or “results in the emission of any air pollutant not previously emitted.” For convenience, unless otherwise indicated, when we refer to changes that “increase[] the amount of any air pollutant emitted,” we mean both to those types of changes and changes that “result[] in the emission of any air pollutant not previously emitted.”

of the GHG sources; (ii) either the term “two hundred fifty tons per year” or “100 tons per year,” or the term “increases the amount,” and those terms could be considered not to refer literally to the tonnage amount of emissions from all of the GHG sources; (iii) the term “any air pollutant,”³¹ and that term could be considered not to refer literally to the emissions from all of the GHG sources; and (iv) the term “subject to regulation under the CAA” (which we have interpreted “any air pollutant” to include), and that term could be considered not to refer literally to the emissions from all of the GHG sources. As long as any one of those four terms may be considered not to have its literal meaning as applied to GHG sources, then the definition as a whole—again, for PSD, the terms “major emitting facility” or “modifications,” and for title V, the term “major source”—cannot be considered to apply literally to GHG sources. Because we read the terms together, as integral parts of each definition as a whole, we do not think that the choice of which of those four terms within each definition cannot be considered to apply literally to GHG sources has substantive legal effect. In other words, we believe that any one of these terms, or all of them together as part of each definition as a whole, should be considered not to apply literally in the case of GHG sources.

Having determined that each definition does not have a literal meaning with respect to the applicability of PSD or title V applies to all GHG sources, we must next inquire as to whether Congress has nevertheless expressed an intent on that question through other means. We discuss the statutory terms and legislative history of the PSD and title V provisions in more detail later, but for now it suffices to say that on the issue of whether PSD and title V apply to GHG sources, we believe that congressional intent is clear, and that is to apply PSD and title V to GHG sources generally. We believe that this intent is clear from the broad phrasing of the applicability provisions—as noted earlier, the definitions apply by their terms to GHG source generally, even though the definitions should not be applied literally to all GHG sources—the fact that the various components of the PSD and title V programs can be readily applied to GHG sources, and the fact that the two programs can readily accommodate at least some GHG

sources. As a result, we believe that as a matter of *Chevron* Step 1, PSD and title V generally apply to GHG sources. Our previous regulatory action defining the applicability provisions made this clear, and we do not reopen this issue in this rulemaking. Moreover, even if this long-established regulatory position were not justifiable based on *Chevron* step 1—on the grounds that in fact, congressional intent on this point is not clear—then we believe that this position, that the statutory provisions to apply PSD and title V generally to GHG sources, was justified under *Chevron* step 2.³²

On the issue of how to apply PSD to GHG sources, including the specific threshold levels and the timing, we believe that Congress could be considered to have expressed a clear intent that GHG sources be included in the PSD program at as close to the statutory thresholds as possible, and as quickly as possible, and at least to a certain point, all as consistent with the need to assure that the PSD program does not impose undue costs on sources or undue administrative burdens on the permitting authorities. Under this view, EPA would be required at *Chevron* Step 1 to adopt the Tailoring Rule because, by phasing in PSD applicability, it most closely gives effect to Congress’s intent. Under these circumstances, EPA is authorized to exercise its expert judgment as to the best approach for phasing in the application of PSD to GHG sources.

Even so, we recognize that it could be concluded that on the issue of how to apply PSD to GHG sources, congressional intent is unclear. Under these circumstances, EPA has the discretion at *Chevron* Step 2 to adopt the Tailoring Rule because it is a reasonable interpretation of the statutory requirements (remaining mindful that the applicability requirements cannot be applied literally). Under the Tailoring Rule, EPA seeks to include as many GHG sources in the permitting programs at as close to the statutory thresholds as possible, and as quickly as possible, although we recognize that we ultimately may stop the phase-in process short of the statutory threshold levels.

As for title V, we believe that taken together, the various statutory requirements and statements in the legislative history do not evidence a

clear congressional intent for how title V is to be applied to GHG sources. As discussed later, the relevant title V requirements and statements in legislative history differ from PSD, not least because they include provisions that concern empty permits that point in different directions. As a result, here, too, EPA has the discretion at *Chevron* Step 2 to adopt the Tailoring Rule as a reasonable interpretation of the statutory requirements. Alternatively, even if the statute does express a clear intent as to title V that, similar to PSD, title V requirements must be phased in as closely to the statutory threshold as possible and as quickly as possible, this Tailoring Rule is consistent with that intent.

It should also be noted that although EPA has concluded that applying the PSD and title V applicability provisions literally in the case of GHG sources would produce “absurd results” and therefore is not required, this conclusion has no relevance for applying other CAA requirements—such as the requirements concerning endangerment and contribution findings under CAA section 202(a)(1) or emission standards for new motor vehicles or new motor vehicle engines under CAA section 202—to GHGs or GHG sources. EPA’s conclusions with respect to the PSD and title V applicability requirements are based on the specific terms of those requirements, other relevant PSD and title V provisions, and the legislative history of the PSD and title V programs.

Within the context of the *Chevron* framework, the “administrative necessity” doctrine applies as follows: Under the doctrine, Congress is presumed to intend that the PSD and title V applicability requirements be administrable. Here, those applicability requirements, if applied to GHG sources in accordance with their literal meaning, would be impossible to administer. Accordingly, under *Chevron* Step 1, it is consistent with congressional intent that EPA and the permitting authorities be authorized to implement the applicability requirements in a manner that is administrable, that is, through the tailoring approach.

As for the “one-step-at-a-time” doctrine, we believe it applies within the *Chevron* framework in conjunction with the “absurd results” and “administrative necessity” doctrines. As we discuss elsewhere, the PSD and title V applicability provisions by their terms require that sources at or above the 100/250 tpy thresholds comply with PSD and title V requirements at the time those requirements are triggered, which

³¹ We do not believe that this term is ambiguous with respect to the need to cover GHG sources under either the PSD or title V program, only with respect to what sources of GHG should be covered under the circumstances presented here.

³² In this preamble and the response to comments document we fully address arguments that commenters and others have presented about congressional intent and coverage of GHGs. We do so to be fully responsive, even though we believe that this is a settled matter for which the time for judicial review has past.

is when GHGs become subject to regulation. Therefore, if the literal meaning of the applicability provisions as applied to GHG sources were controlling—that is, if it reflected congressional intent—it would foreclose use of the one-step-at-a-time doctrine to implement a phase-in approach. However, the literal meaning is not controlling because—in light of the absurd results, including the insurmountable administrative burdens, that would result from the literal meaning—congressional intent is not to require the application of the PSD and title V requirements to all GHG sources at or above the statutory thresholds at the time that GHGs become subject to regulation. Instead, as described previously, we consider congressional intent for the applicability provisions, as applied to GHG sources, either (i) to be clear that PSD and title V should be phased in for GHG sources as quickly as possible, or (ii) to be unclear, so that EPA may reasonably choose to phase PSD and title V in for those sources in that manner. Under either view, congressional intent for PSD and title V applicability to GHG sources accommodates the “one-step-at-a-time” approach.

4. The PSD and Title V Programs

Having discussed both the factual underpinnings and, immediately above, the legal underpinnings for our tailoring approach, we now discuss the PSD and title V programs themselves, including, for each program, the key statutory provisions, their legislative history, and the relevant regulations and guidance documents through which EPA has implemented the provisions. We start with the PSD program.

a. The PSD program

(1) PSD Provisions

Several PSD provisions are relevant for present purposes because of the specific requirements that they establish and the window that they provide into congressional intent. These provisions start with the applicability provisions, found in CAA sections 165(a) and 169(1), which identify the new sources subject to PSD, and CAA section 111(a)(4), which describes the modifications of existing sources that are subject to PSD. CAA section 165(a) provides:

No major emitting facility on which construction is commenced after August 7, 1977, may be constructed in any area to which this part applies unless—

(1) A permit has been issued for such proposed facility in accordance with this part setting forth emission limitations for such

facility which conform to the requirements of this part;

(2) The proposed permit has been subject to a review in accordance with this section * * * and a public hearing has been held with opportunity for interested persons including representatives of the Administrator to appear and submit written or oral presentations on the air quality impact of such source, alternatives thereto, control technology requirements, and other appropriate considerations;

* * * * *

(4) The proposed facility is subject to the best available control technology for each pollutant subject to regulation under this chapter emitted from, or which results from, such facility * * *.

The term “major emitting facility” is defined, under CAA section 169(1) to include:

* * * stationary sources of air pollutants which emit, or have the potential to emit, one hundred tons per year or more of any air pollutant from [28 listed] types of stationary sources. * * * Such term also includes any other source with the potential to emit two hundred and fifty tons per year or more of any air pollutant. This term shall not include new or modified facilities which are nonprofit health or education institutions which have been exempted by the State.

As for modification of existing sources, CAA section 169(1)(C) provides that the term “construction,” as used in CAA section 165(a) (the PSD applicability section) “includes the modification (as defined in section 111(a)(4)) of any source or facility.” Section 111(a)(4), in turn, provides:

The term “modification” means any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.

As interpreted by EPA regulations, these provisions, taken together, provide that new stationary sources are subject to PSD if they emit at the 100/250-tpy thresholds air pollutants that are subject to EPA regulation, and that existing stationary sources that emit such air pollutants at the 100/250-tpy thresholds are subject to PSD if they undertake a physical or operational change that increases their emissions of such air pollutants by any amount.

Other provisions of particular relevance are the requirements for timely issuance of permits. The permitting authority must “grant[] or deny[] [any completed permit application] not later than one year after the date of filing of such completed application.” CAA section 165(c).

In addition, the PSD provisions articulate “the purposes of [the PSD program],” which are to balance

environmental protection and growth. CAA section 160. One of the purposes, in subsection (1), is specifically “to protect public health and welfare,” and another, in subsection (3), is “to insure that economic growth will occur in a manner consistent with the preservations of existing clean air resources.”

The PSD provisions also include detailed procedures for implementation. Most relevant for sources of GHG are the provisions that the proposed permit for each source must be the subject of a public hearing with opportunity for interested persons to comment, CAA section 165(a)(2), and each source must be subject to BACT, as determined by the permitting authority on a source-by-source basis, CAA section 165(a)(4), 169(3).

(2) PSD Legislative History

The legislative history of the PSD provisions, enacted in the 1977 CAA Amendments, makes clear that Congress was largely focused on sources of criteria pollutants: primarily sulfur dioxide, PM, NO_x, and carbon monoxide (CO). This focus is evident in the basic purpose of the PSD program, which is to safeguard maintenance of the NAAQS. *See* S 95–127 (95th Cong., 1st Sess.), at 27.

Congress designed the PSD provisions to impose significant regulatory requirements, on a source-by-source basis, to identify and implement BACT and, for criteria pollutant, to also undertake certain studies. Congress was well aware that because these requirements are individualized to the source, they are expensive. Accordingly, Congress designed the applicability provisions (i) to apply these requirements to industrial sources of a certain type and a certain size—sources within 28 specified source categories and that emit at least 100 tpy—as well as all other sources that emit at least 250 tpy, and, by the same token, (ii) to exempt other sources from these requirements.³³

Although Congress required that CAA requirements generally apply to “major emitting facilities,” defined as any source that emits or has the potential to emit 100 tpy of any pollutant, Congress applied PSD to only sources at 100 tpy or higher in 28 specified industrial source categories, and at 250 tpy or

³³ Coverage of modifications by the PSD program was addressed by a technical amendment which added a cross reference in section 169 to section 111. The legislative history of this provision is scant and there is no suggestion that Congress would have contemplated sweeping in large number of changes from smaller sources through the addition of this provision.

more in all other source categories. This distinction was deliberate: According to Sen. McClure, Congress selected the 28 source categories after reviewing an EPA study describing 190 industrial source categories. 122 *Cong. Rec.* 24521 (July 29, 1976) (statement by Sen. McClure).

Congress also relied on an EPA memorandum that identified the range of industrial categories that EPA regulated under its regulations that constituted the precursor to the statutory PSD program,³⁴ and listed both the estimated number of new sources constructing each year and the amount of pollution emitted by the “typical plant” in the category. The memorandum was prepared by B.J. Steigerwald, Director of the Office of Air Quality Planning and Standards and Roger Strelow, EPA’s Assistant Administrator for Air and Waste Management (“Steigerwald-Strelow memorandum”). The Steigerwald-Strelow memorandum makes clear that the 100 tpy cut-off for the 28 listed source categories, and the 250 tpy cut-off for all other sources, was meaningful; that is, there were a large number of sources below those cut-offs that Congress explicitly contemplated would not be included in the PSD program. *Id.* at 24548–50.

Consistent with this, the legislative history on the Senate side also specifically identified certain source categories that Senators believed should not be covered by PSD. The Senate bill language limited PSD to sources of 100 tpy or more in 28 listed source categories, and to any other categories that the Administrator might add. Sen. Muskie stated that the Senate bill excluded “houses, dairies, farms, highways, hospitals, schools, grocery stores, and other such sources.” 123 *Cong. Rec.* 18021 (June 8, 1977) (statement of Sen. Muskie). Sen. McClure’s list of excluded source categories were “[a] small gasoline jobber, or a heating plant at a community college, [which] could have the potential to emit 100 tons of pollution annually.” 122 *Cong. Rec.* 24548–49 (July 29, 1976) (statement of Sen. McClure). The Senate Committee Report included a comparable list, and in describing it, concisely articulated the cost-conscious basis for the line-drawing: “[the PSD] procedure * * * must include an effective review-and-

permit process. Such a process is reasonable and necessary for very large sources, such as new electrical generating plants or new steel mills. But the procedure would prove costly and potentially unreasonable if imposed on construction of storage facilities for a small gasoline jobber or on the construction of a new heating plant at a junior college, each of which may have the potential to emit 100 tons of pollution annually.” S. Rpt. 95–127 at 96–97.

The enacted legislation differs from the Senate bill by replacing the authorization to EPA to include by regulation source categories in addition to the listed 28 source categories with an inclusion of all other sources if they exceed 250 tpy, and with an authorization for the states to exempt hospitals and educational institutions. But Congress’s overall intention remains clear, as the DC Circuit described in *Alabama Power*: “Congress’s intention was to identify facilities which, due to their size, are financially able to bear the substantial regulatory costs imposed by the PSD provisions and which, as a group, are primarily responsible for emissions of the deleterious pollutants that befoul our nation’s air * * *. [With respect to] the heating plant operating in a large high school or in a small community college * * * [w]e have no reason to believe that Congress intended to define such obviously minor sources as ‘major’ for the purposes of the PSD provision.”³⁵ 636 F.2d at 353–54.

A particularly important indication of congressional intent to limit the PSD program it was designing to larger sources comes in considering the emissions profile of the small-sized boilers. Congress focused closely on identifying which sources with emissions in excess of 100 tpy should not be subject to PSD even though they are subject to CAA requirements generally. But Congress viewed a large set of sources as emitting below 100 tpy and therefore not included in the PSD program. Chief among these sources, in terms of absolute numbers of sources, were small boilers. The Steigerwald-Strelow memorandum identified two categories of these boilers, differentiated by size. The first ranges in size from 10 to 250 x 10⁶ Btu per hour (Btu/hr), and has a “typical plant” size of 10⁷ Btu/hr, with “BACT emissions from typical plant” of 53 tpy, and a total of 1,446

sources in the category. The second category ranges in size from 0.3 to 10 x 10⁶ Btu/hr, and has a “typical plant” size of 1.3 x 10⁶ Btu/hr, with “BACT emissions from typical plant” of 2 tpy, and a total of 11,215 sources in the category. The memorandum discusses these two categories in the context of explaining which source categories exceed a size of 100 tpy—and therefore would be subject to PSD if a 100 tpy threshold were set—by stating, “Fortunately, most truly small boilers and typical space heating operations would not be covered.” 122 *Cong. Rec.* 24549 (July 29, 1976).

The legislative history also provides a window into the scope of the program that Congress anticipated and related administrability concerns. According to the Steigerwald-Strelow memorandum, the number of new sources each year whose “BACT emissions from typical plant” exceed 100 for the 28 listed source categories and 250 for all other source categories is less than 100 per year. Although the Steigerwald-Strelow memorandum does not attempt to estimate the number of modifications, it appears that based on this information, Congress had reason to expect the total size of the PSD program to be measured in the hundreds or perhaps thousands of permits each year. A program of this size would be manageable by EPA and the permitting authorities.

(3) PSD Regulatory History: Regulations Concerning the Definition of “Major Stationary Source”

For present purposes, the regulatory history of the PSD program is most noteworthy because it shows that since the inception of the program following the 1977 CAA Amendments, EPA has interpreted the statutory PSD applicability provisions to apply more narrowly—to any air pollutant *subject to regulation*—than their literal meaning (“any air pollutant”). EPA’s initial rulemaking implementing the PSD program, which was proposed and finalized in 1977–1978, made explicit that the entire PSD program applied to only pollutants regulated under the Act. 43 FR 26380, 26403, 26406 (June 19, 1978) (promulgating 40 CFR 51.21(b)(1)(i)). In 1979–1980, EPA revised the PSD program to conform to *Alabama Power v. Costle*, 636 F.2d 323 (DC Cir. 1980). 44 FR 51924 (September 5, 1979) (proposed rule); 45 FR 52676 (August 7, 1980) (final rule). In this rulemaking, EPA did not disturb the pre-existing provisions that limited the applicability of the PSD program to

³⁴ Beginning in 1974, EPA implemented a program that required sources of certain NAAQS pollutants seeking to construct in attainment or unclassifiable areas to implement emission controls for the purpose of preventing deterioration in the ambient air quality in those areas. This program was the precursor to the PSD program Congress enacted in 1977.

³⁵ Note that although Congress specifically authorized the states to exempt “nonprofit health or education institutions” from the definition of “major emitting facility,” this statement by the DC Circuit should be taken as the Court’s view that Congress did not design PSD to cover sources of the small size described.

regulated air pollutants.³⁶ In 1996 EPA proposed, and in 2002 finalized, a set of amendments to the PSD provisions that included revisions to conform with the 1990 CAA Amendments, which, in relevant part, exempted hazardous air pollutants (HAPs) from PSD, under CAA section 112(b)(6). *See* 61 FR 38250 (July 23, 1996), 67 FR 80186 (December 31, 2002). In the preamble to the final rule, EPA noted that based on a request from a commenter, EPA was amending the regulations to “clarify which pollutants are covered under the PSD program.” EPA accomplished this by promulgating a definition for “regulated NSR pollutant,” which listed categories of pollutants regulated under the Act, and by substituting that defined term for the phrase “pollutants regulated under the Act” that was previously used in various parts of the PSD regulations. 67 FR 80240. The definition of “regulated NSR pollutant” includes several categories of pollutants (including, in general, NAAQS pollutants and precursors, pollutants regulated under CAA section 111 NSPS, Class I or II substances regulated under CAA title VI) and a catch-all category, “[a]ny pollutant that otherwise is subject to regulation under the Act.” *E.g.*, 40 CFR 52.21(b)(50). As in the previous rulemakings, EPA did not address the difference between the definition of “major emitting facility” and its regulatory approach or indicate that it had received comments on this issue. While the definition of “major modification” in the PSD regulations has changed over time with respect to how emission increases are calculated, the regulatory history with respect to pollutant coverage parallels that of major emitting facility.

We recount this regulatory history as background information. We are not reconsidering or reopening these regulations to the extent they interpret the definition of “major emitting facility” and “modification” narrowly to be limited to pollutants subject to regulation under the Act.

³⁶ As noted elsewhere in this notice, in *Alabama Power*, the DC Circuit noted that the definition of “major emitting facility” under CAA section 169(1) could apply to air pollutants not regulated under other provisions of the Act, and discussed the contrast of this broad definition to the narrower application of the BACT provisions. 636 F.2d at 352–53 & n. 60. In its rulemaking notices responding to *Alabama Power*, EPA discussed at length certain issues, such as the applicability of NSR to pollutants emitted below the “major” thresholds, that are based on the reference in “major emitting facility” to “any air pollutant.” However, throughout its discussion, EPA interpreted that reference as “any regulated air pollutant,” again without specifically acknowledging the difference or without acknowledging the above-noted statements in *Alabama Power*. *See* 45 FR 52710–52711. EPA did not indicate that it had received comments on this issue.

b. Title V Program

Having reviewed the key statutory provisions, their legislative history, and the relevant administrative interpretations for the PSD program, we now do the same for the title V program.

(1) Title V Provisions

The key title V provisions for present purposes start with the applicability provisions, which are found in CAA sections 502(a), 501(2)(B), and 302(j). These provisions provide that it is unlawful for any person to operate a “major source” without a title V permit, section 502(a), and define a “major source” to include “any major stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant.” CAA sections 501(2)(B) and 302(j). As noted elsewhere, these provisions, taken together and as interpreted by EPA, provide that stationary sources are subject to title V if they emit at the 100-tpy threshold air pollutants that are subject to EPA regulation.

In addition, although title V does not have a set of provisions describing its purpose, it is clear from its provisions and its legislative history, discussed later, that its key goal is to gather into one permitting mechanism the CAA requirements applicable to a source and impose conditions necessary to assure compliance with such requirements, and thereby promote the enforceability of CAA requirements applicable to the covered sources. Section 503(b)(1) requires that the source’s permit application contain a compliance plan describing how the source will “comply with all applicable requirements” of the CAA, and section 504(a) requires that “[e]ach permit issued under [title V] shall include * * * such * * * conditions as are necessary to assure compliance with applicable requirements of [the Act].” *See* H.R. Rep. No. 101–490, at 351 (1990) (“It should be emphasized that the operating permit to be issued under this title is intended by the Administration to be the single document or source of all of the requirements under the Act applicable to the source.”).

Importantly, title V is replete with provisions designed to make the permitting process as efficient and smooth-running as possible, including the expeditious processing of permit applications and the timely issuance of permits. Section 503(c) requires that “the permitting authority shall approve or disapprove a completed application * * * and shall issue or deny the permit, within 18 months after the date

of receipt thereof * * *.” Section 502(b)(6) requires the permitting authority to develop “adequate, streamlined, and reasonable procedures for expeditiously determining when applications are complete, for processing such applications, for public notice * * * and for expeditious review of permit actions, including * * * judicial review in State court of the final permit action by [specified persons].” Section 502(b)(7) includes a “hammer” provision designed to reinforce timely permit issuance, which is that the permitting authority’s program must include:

To ensure against unreasonable delay by the permitting authority, adequate authority and procedures to provide that a failure of such permitting authority to act on a permit application or permit renewal application (in accordance with the time periods specified in [CAA] section 503 * * *) shall be treated as a final permit action solely for purposes of obtaining judicial review in State court of an action brought by any person referred to in paragraph (6) to require that action be taken by the permitting authority on such application without additional delay.

Section 502(b)(8) requires the permit program to include “[a]uthority and reasonable procedures consistent with the need for expeditious action by the permitting authority on permit applications and related matters, to make available to the public [certain permit-related documents]”. Section 502(b)(9) requires a permit revision to incorporate requirements promulgated after issuance of the permit, but only if the permit is for a major source and has a term of 3 or more years remaining. In addition, the revision must occur “as expeditiously as practicable.” Section 502(b)(10) requires the permit program to include operational flexibility provisions that “allow changes within a permitted facility * * * without requiring a permit revision, if the changes are not modifications * * * and * * * do not exceed the emissions allowable under the permit * * *.”

In addition, title V includes a comprehensive and finely detailed implementation schedule that mandates timely issuance of permits while building in EPA and affected state review, public participation, and timely compliance by the source with reporting requirements. Following the date that sources become subject to title V, they have 1 year to submit their permit applications. CAA section 503(c). As noted previously, the permitting authority then has 18 months to issue or deny the permit. CAA section 503(c). Permitting authorities must provide an opportunity for public comment and a hearing. CAA section 502(b)(6). If the permitting authority proposes to issue

the permit, the permitting authority must submit the permit to EPA, and notify affected states, for review. CAA section 505(a)(1). EPA then has 45 days to review the permit and, if EPA deems it appropriate, to object to the permit. CAA section 505(b)(1). If EPA does object, then the permitting authority must, within 90 days, revise it to meet the objections, or else EPA becomes required to issue or deny the permit. CAA section 505(c). If EPA does not object, then, within 60 days of the close of the 45-day review period, any person may petition EPA to object, and EPA must grant or deny the petition within 60 days. CAA section 505(b)(2). If a permit is issued, it must include a permit compliance plan, under which the permittee must “submit progress reports to the permitting authority no less frequently than every 6 months,” and must “periodically (but no less frequently than annually) certify that the facility is in compliance with any applicable requirements of the permit, and [] promptly report any deviations from permit requirements to the permitting authority.” CAA section 503(b).

(2) Title V Legislative History

The legislative history of title V, enacted by Congress in the 1990 CAA Amendments, indicates the scope of the program that Congress expected: Congress expected the program to cover some tens of thousands of sources, which would approximate the scope of the permit program under the Clean Water Act. The Senate Committee on Environment and Public Works stated:

EPA estimates that the new permit requirements will cover about 8,200 major sources that emit 100 tons per year or more of criteria pollutants (which are regulated under SIPs). In addition, many smaller sources are (or, as EPA promulgates additional regulations, will be) covered by new source performance standards under section 111 of the Act, hazardous air pollutant standards under section 112 of the Act, and nonattainment provisions of this legislation. By comparison, under the Clean Water Act, some 70,000 sources receive permits, including more than 16,000 major sources. Although many air pollution sources have more emission points than water pollution sources, the additional workload in managing the air pollution permit system is estimated to be roughly comparable to the burden that States and EPA have successfully managed under the Clean Water Act.

S. Rep. 101–228, at 353 (1990).³⁷ Sen. Mitchell, the Senate Majority Leader,

stated that he expected “over 10,000 permits [to] * * * be issued under this program.” 136 Cong. Rec. S3239–03 (March 27, 1990). Others in Congress had similar estimates. *See, e.g.*, 136 Cong. Rec. S3166 (“thousands and thousands of permit applications * * * will be required to be submitted”) (statement of Sen. Nickles).

Furthermore, the legislative history indicates that Congress did not contemplate that large numbers of very small sources would be subject to title V’s requirements.³⁸ This becomes clear by reviewing the legislative history of a companion piece of legislation to the operating permits provisions that Congress enacted into CAA section 507, which is the “Small business stationary source technical and environmental compliance assistance program.” CAA section 507. Under this provision, sources that, among other things, “are not major stationary source[s]” and that emit less than 50 tpy of any regulated pollutant, as well as less than 75 tpy or all regulated pollutants, are eligible for assistance under CAA section 507. CAA section 507(c)(1). The House Committee Report described this provision—including what types of sources it expected this provision to benefit—as follows:

New section [507] is a small source/small business provision added by the Committee. It seeks to help small businesses to comply with the problems that are likely to occur under the Act as amended by this bill. For purposes of this section, small businesses or small emitters are defined as sources that are emitting 100 tons or less per year and that have a number of employees that would qualify them for assistance from the Small Business Administration (SBA). As we look to the future of environmental protection under the Act, we take special steps here to ensure that it is possible for these small businesses to comply with minimum hassle and in recognition of the problems that are unique to them. Such small businesses include printers, furniture makers, dry cleaners, and millions of other small businesses in this country.

House Committee Report, H.R. 101–590, at 354. In this manner, the House Committee Report made clear that it

thereafter in each State or to EPA,” H. Rep. 101–490 p. 346.

³⁸ Title V can apply to certain small businesses in some circumstances. Under CAA sections 502(a) and 501(2)(A), title V applies to major sources of HAPs, which includes sources that may emit as little as 10 tpy of a single HAP, and which may include some dry cleaners and other small businesses. In addition, under CAA section 502(a), title V applies to area sources subject to standards under CAA sections 111 or 112 (or required to have a PSD or nonattainment NSR permit), unless the Administrator exempts those sources from title V because compliance would be impracticable, infeasible, or unnecessarily burdensome.

expected “millions of * * * small businesses”—including “printers, furniture makers, dry cleaners” and many others—to benefit from the CAA section 507 small source/small business program, but Congress did not expect them to become subject to the operating permit requirements of title V because their emissions fell below 100 tpy, which is, in general, the threshold for title V applicability as a “major source.”

The legislative history of title V confirms that Congress viewed a principal purpose of title V as providing a vehicle to compile the requirements applicable to the source. As the report of the House Committee on Energy and Commerce (“House Committee Report”) stated, “It should be emphasized that the operating permit to be issued under this title is intended by the Administration to be the single document or source of all of the requirements under the Act applicable to the source.” H.R. Rep. No. 101–490, at 351 (1990). Combined with the source’s reporting requirements, this compilation of applicable requirements would facilitate public awareness of a source’s obligations and compliance and would facilitate compliance and enforcement.

On the Senate side, Sen. Chafee, one of the floor managers of the bill, made a similar point:

The permits will serve the very useful function of gathering and reciting in one place—the permit document itself—all of the duties imposed by the Clean Air Act upon the source that holds the permit. This would clearly be an improvement over the present system, where both the source and EPA must search through numerous provisions of state implementation plans and regulations to assemble a complete list of requirements that apply to any particular plant * * *.

Once these permits are in place, plant managers will be better able to understand and to follow the requirements of the Clean Air Act. At the same time, EPA will be better able to monitor how well each plant is complying with those requirements. This is a highly sensible approach for all concerned.

136 Cong. Rec. S213 (January 24, 1990) (statement of Sen. Chafee). Sen. Lieberman made a similar statement. 136 Cong. Rec. 3172–73 (March 26, 1990) (statement of Sen. Lieberman). Thus, a central purpose of the title V permit program is to compile all the requirements applicable to the source into a single place, the permit. Implicit in this purpose is that the sources subject to title V will have applicable requirements to be compiled. As Sen. Chafee directly stated, “[T]he vast majority of these permit applications will * * *, in all likelihood, only codify the existing requirements of the applicable State implementation plan.”

³⁷ The House Committee on Energy and Commerce acknowledged that it was “uncertain about the magnitude of permit applications likely to be submitted under the bill initially and

136 Cong. Rec. S2720 (March 20, 1990) (statement of Sen. Chafee).

More broadly, the legislative history also indicates congressional concern about the costs of permitting for small businesses, and a determination to minimize those costs to the extent possible. This concern is reflected in several provisions of title V. For example, section 502(a) authorizes EPA to exempt all or part of a source category—except for any major source from the title V permit program if EPA “finds that compliance with [title V] requirements is impracticable, infeasible, or unnecessarily burdensome on such categories.” Similarly, the permit fee provisions include a presumptive minimum fee amount, but authorize an exemption from that presumptive amount upon a showing that a lesser amount will meet overall fee requirements, CAA section 502(b)(3)(B)(iv). One of the drafters of this provision, Rep. Wyden, explained that its purpose was to preserve the flexibility of states to impose lower fees of small businesses:

I note that the provision on fees allows reductions for small sources where appropriate. The state has some flexibility, under the general permit fee provisions, to adjust fee levels for any source so long as the average fee charged meets the statutory minimum.

136 Cong. Rec. H12884 (Oct. 26, 1990) (statement of Rep. Wyden). *See, e.g.*, 136 Cong. Rec. H2559 (May 21, 1990) (statement of Rep. Wyden) (discussing need to “help small businesses through the air permit labyrinth”).

The legislative history also indicates that Congress was deeply concerned both about the need not to burden sources generally with undue costs and to assure the administrability of the title V program, and as a result, was determined to make the program as smooth-running as possible. These goals are reflected in many of the title V requirements, as discussed previously. *See, e.g.*, CAA section 502(b)(6) (requiring “adequate, streamlined, and reasonable procedures for expeditiously determining when applications are complete, for processing such applications, for public notice * * * and for expeditious review of permit actions); CAA section 502(b)(7) (includes a “hammer” provision designed to reinforce timely permit issuance); CAA section 502(b)(9)–(10) (limiting circumstances under which permit revision is required; requiring revision to occur “as expeditiously as practicable,” including operational flexibility provisions).

The legislative history confirms that these provisions were designed to

reduce costs to sources and promote administrability. The “Chafee-Baucus Statement of Senate Managers” for the bill explained the purpose of the CAA section 502(b)(6) requirement for “[a]dequate, streamlined, and reasonable procedures for expeditious[]” permit actions as follows:

[M]uch concern has been expressed that this new permitting process will unduly delay the proper functioning of many sources, and we intend to mitigate any delay by directing that the process be expeditious.

In addition to this general directive for expeditious processing, we mandate in new section 503 that permitting authorities approve or reject permit applications within certain specified time periods following filing. In this fashion, we have taken explicit steps to protect against undue delays.

136 Cong. Rec. S16941 (statement of Sen. Chafee). The same statement explained that the permit revision procedures of CAA section 502(b)(9) reflect a—

careful effort to ensure that the permit program works effectively and efficiently. Succinctly, this provision accommodates two competing concerns. On the one hand, it is important to ensure that permit requirements remain up-to-date as the provisions of the Clean Air Act are developed and new requirements are imposed. On the other hand, it also is important to be sure that we do not reduce the permit program to a shambles by requiring sources to engage in a continuous process of revising their permits as these new requirements are imposed.

136 Cong. Rec. 16942 (Oct. 27, 1990) (Chafee-Baucus statement of Senate Managers) (statement of Sen. Chafee).

In addition, these concerns were at the bottom of the following statement by Sen. Chafee, in which he described how the bill’s drafters had revised it in response to a concern by industry that an earlier version of the bill would have put undue costs on industry:

We have also heard concerns from industry that S. 1630 would burden sources unduly by requiring them to submit—along with their permit applications—plans explaining how they intend to comply with all requirements of the Clean Air Act that apply to them.

But, Mr. President, we emphatically do not intend to burden industry with preparation and submission of unnecessary compliance plans. The substitute clarifies that any compliance plans would address only those matters by which the sources would comply with new requirements imposed by this act as it is finally signed into law. These plans would not need to address compliance with any existing Clean Air Act requirements, unless the source is in violation of those requirements.

136 Cong. Rec. S2107 (March 5, 1990) (statement of Sen. Chafee).

As another indication of congressional concern over administrability, Congress recognized

that at the beginning of the program, large numbers of permit applications might overwhelm the permitting authorities. To protect against this, Congress included in CAA section 503(c) a phase-in schedule for permitting authorities to act on the initial set of permit applications. Under 503(c), permitting authorities were not required to act on the initial set of permit applications within 18 months after it received the application, but rather could act on one-third of them on an annual basis over a 3-year period. Sen. Chafee, in describing an early version of this provision—which would have allowed permitting authorities to phase in the submission of permit applications—explained that its purpose was “to avoid a logjam of permit applications[,] * * * ensure that [regulatory] gridlock can be avoided, and [ensure] that the permitting process will work with a minimum of disruption and delay.” 136 Cong. Rec., S2106 (March 5, 1990) (statement of Sen. Chafee).

(3) Title V Regulatory History

As with PSD, for present purposes, the regulatory history of the title V program is most noteworthy because it shows that beginning shortly after the inception of the program following the 1990 CAA Amendments, EPA has interpreted the statutory title V applicability provisions to apply more narrowly—to any air pollutant *subject to regulation*—than their literal meaning (“any air pollutant”). As discussed previously, title V applies to any “major source,” defined, as relevant here, under CAA sections 501(2)(B) and 302(j), as “any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant * * *.” EPA’s regulations mirror the CAA definitional provisions. 40 CFR 70.2.

However, since 1993, EPA has interpreted the applicability provisions more narrowly. At that time, which was shortly after title V was enacted, EPA issued a guidance document making clear that it interprets this requirement to apply to sources of pollutants “subject to regulation” under the Act. Memorandum from Lydia N. Wegman, Deputy Director, Office of Air Quality Planning and Standards, U.S. EPA, “Definition of Regulated Air Pollutant for Purposes of Title V” (Apr. 26, 1993) (Wegman Memorandum). The interpretation in this memorandum was based on: (1) EPA’s reading of the definitional chain for “major source” under title V, including the definition of “air pollutant” under section 302(g) and

the definition of “major source” under 302(j); (2) the view that Congress did not intend to require a variety of sources to obtain title V permits if they are not otherwise regulated under the Act (*see* also CAA section 504(a), providing that title V permits are to include and assure compliance with applicable requirements under the Act); and (3) consistency with the approach under the PSD program.

While the specific narrow interpretation in the Wegman Memorandum of the definition of “air pollutant” in CAA section 302(g) is in question in light of the holding in *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007) (finding this definition to be “capacious”), we believe that the overall rationale for our interpretation of the applicability of title V remains sound. EPA continues to maintain its interpretation, consistent with CAA sections 302(j), 501, 502 and 504(a), that the provisions governing title V applicability for “a major stationary source” can only be triggered by emissions of pollutants subject to regulation. This interpretation is based primarily on the purpose of title V to collect all regulatory requirements applicable to a source and to assure compliance with such requirements, *see, e.g.*, CAA section 504(a), and on the desire to promote consistency with the approach under the PSD program.

In the Tailoring Rule notice of proposed rulemaking, EPA acknowledged the Wegman Memorandum and affirmed the memorandum’s continued viability, stating that “EPA continues to maintain this interpretation.” 74 FR 55300, col. 3, fn. 8; *see also* 75 FR 17022–23 (Interpretive Memo reconsideration).

As with PSD, we recount this regulatory history as background information, and we are not reconsidering or re-opening this interpretation of the definition of “major source” narrowly to be limited to pollutants subject to regulation under the Act.

5. Application of the “Absurd Results” Doctrine for the PSD Program

Having reviewed the factual background, legal doctrines, and the key components of the PSD and title V programs, we now turn towards interpreting the PSD and title V requirements in accordance with the *Chevron* framework, accounting for the applicable legal doctrines. We begin with the “absurd results” doctrine, and apply it first to the PSD requirements.

In this action, we finalize, with some refinements, the “absurd results” basis we proposed. Specifically, we are

revising our regulations to limit PSD applicability to GHG emitting sources by revising the regulatory term, “regulated NSR pollutant,” and although our revised regulations do not accord with a literal reading of the statutory provisions for PSD applicability, which are incorporated into the definition of “major emitting facility” and “major modification,” we have concluded that based on the “absurd results” doctrine, a literal adherence to the terms of these definitions is not required. Even so, we believe Congress did intend that PSD apply to GHG sources as a general matter. Further, we may apply PSD to GHG sources in a phased-in manner, as we do through the tailoring approach, because either congressional intent is clear on that issue and the tailoring approach best reflects it, or congressional intent is unclear and the tailoring approach is a reasonable interpretation of the statute.

a. Congressional Purpose for the PSD Program

To reiterate, for convenience, CAA section 169(1) defines a “major emitting facility” to include “any * * * source[] [that] emit[s], or ha[s] the potential to emit, [depending on the source category], one hundred [or two hundred fifty] tons per year or more or more of any air pollutant.” CAA section 169(1); and a “modification” as any physical or operational change in “a stationary source which increases the amount of any air pollutant emitted by such source,” CAA section 169(2)(C), 111(a)(4). We also reiterate that, as discussed above, beginning with our initial rulemaking in 1977–1978 to implement the PSD program, we have interpreted these definitions more narrowly by reading into them the limitation that a source is subject to PSD only if the air pollutants in question are “subject to regulation under the Act.” 40 CFR 51.166(b)(49)(iv). EPA is not re-opening this interpretation in this regulation in this action.

Under the current interpretation of the PSD applicability provision, EPA’s recent promulgation of the LDVR will trigger the applicability of PSD for GHG sources at the 100/250 tpy threshold levels as of January 2, 2011. This is because PSD applicability hinges on the definition of “major emitting facility,” which, under EPA’s long-standing narrowing interpretation, but absent further tailoring, applies PSD to sources of any air pollutant subject that is subject to regulation under another provision of the CAA. EPA’s promulgation of the LDVR means that GHGs will become subject to regulation

on the date that the rule takes effect, which will be January 2, 2011.

But absent tailoring, the January 2, 2011 trigger date for GHG PSD applicability will subject an extraordinarily large number of sources, more than 81,000, to PSD each year, an increase of almost 300-fold. And the great majority of these new sources will be small commercial or residential sources. We believe that for many reasons, this result is contrary to congressional intent for the PSD program, and in fact would severely undermine what Congress sought to accomplish with the program. As a result, under our *Chevron* analysis, accounting for the “absurd results” doctrine, the statutory definition for “major emitting facility” (as interpreted narrowly to include “subject to regulation”) should not be read to apply to all GHG sources at or above the 100/250 tpy threshold as of the January 2, 2011 date. Rather, the definitions of “major emitting facility” and “modification” should be tailored so that they apply to GHG sources on a phased-in basis, with the largest sources first, as we describe in this rule.

As explained previously, *Chevron* Step 1 calls for a determination of congressional intent, and the courts consider the best indicator of congressional intent to be the plain meaning of the statute. However, the U.S. Supreme Court has held that the literal meaning of a statutory provision is not conclusive “in the ‘rare cases [in which] the literal application of a statute will produce a result demonstrably at odds with the intentions of the drafters’ * * * [in which case] the intention of the drafters, rather than the strict language, controls.” *United States v. Ron Pair Enterprises*, 489 U.S. 235, 242 (1989). To determine whether “the intentions of the * * * drafters” differ from the result produced from “literal application” of the statutory provisions in question, the courts may examine the overall context of the statutory provisions, including whether there are related statutory provisions that either conflict or are consistent with that interpretation; and the legislative history to see if it exposes what the legislature meant by the terms in question. In addition, the courts may examine whether a literal application of the provisions produces a result that the courts characterize variously as absurd, futile, strange, or indeterminate, and therefore so illogical or otherwise contrary to sensible public policy as to be beyond anything Congress would reasonably have intended. In such cases, the literal language cannot be said to reflect the intention of the drafters, and

therefore does not control. *See United States v. Ron Pair Enterprises*, 489 U.S. 235, 242–43 (1989); *Griffin v. Oceanic Contractors, Inc.*, 458 U.S. 564, 571 (1982).

Here, applying the definitions of “major emitting facility” and “modification” literally (as EPA has interpreted them more narrowly) at the present time—in the absence of streamlining measures or additional permitting authority resources, and without tailoring—would be contrary to congressional purpose for the PSD provisions, as found in the statutory provisions and legislative history, especially in light of the impact from applying those definitions literally. Congress established the PSD program in large measure because it was concerned that around the country, industrial development, which was confronting barriers to locating in nonattainment areas (that is, areas that do not meet the NAAQS), would attempt to locate in clean air areas (that is, attainment areas or unclassifiable areas), but that as a consequence, the clean air areas would see their air quality deteriorate to the point where they, too, would no longer meet the NAAQS. The end result would be the spread of environmental and health problems to those formerly clean air areas, as well as more barriers to further industrial development. With these concerns in mind, Congress designed the PSD program to require newly constructing or modifying sources in areas with air quality that meets the NAAQS (or that is unclassifiable) to analyze their emissions of NAAQS pollutants and to implement controls as needed to assure that those emissions do not significantly deteriorate air quality. Many of the PSD requirements, and much of the discussion in the legislative history, reflect these aspects of the PSD program. *E.g.*, CAA sections 162, 163, 164, 165(a)(3), 165(d)(2), 165(e), 166; *see generally* H. Rep. 95–294, 95th Cong., 1st Sess. (1977) 103–78.

Congress also designed the PSD program to impose controls on non-NAAQS pollutants, through the requirement under CAA section 165(a)(4) that the source be “subject to the best available control technology for each pollutant subject to regulation under this chapter emitted from, or which results from, such facility.” For example, when Congress enacted the PSD provisions in 1977, sources emitting HAPs were required to implement BACT for those pollutants, although in the 1990 CAA Amendments, Congress redesigned CAA section 112, which includes the

requirements for HAPs, and excluded HAPs from PSD. CAA section 112(b)(6).

Congress was keenly aware that the PSD program needed to serve two purposes: Protect the environment and promote economic growth. Congress explicitly identified these two goals in the “purposes” section of the PSD provision, CAA section 160, and various PSD requirements clearly reflect them. For example, to protect economic growth, the PSD program expedites the permit process to include a 1-year limitation on the time that the permitting authority has act on permit applications. To protect the environment, in addition to including many provisions that focus on NAAQS pollutants, the PSD program requires that the preconstruction permit impose emission limits that reflect BACT for each pollutant subject to regulation under another CAA provision. CAA section 165(a)(4). This BACT provision also makes clear, by its terms, that although Congress designed the PSD program largely with NAAQS pollutants in mind, Congress also intended that sources subject to PSD control the emissions of their other pollutants as well. The DC Circuit has recognized the twin goals of environmental protection and economic development that underlie PSD, and has upheld EPA interpretations of the PSD program that reflect a balancing of those goals. *See, e.g., New York v. EPA*, 413 F.3d 3, 27 (DC Cir.), *rehearing en banc den.* 431 F.3d 801 (2005).

Congress was also keenly aware that the PSD analyses and controls that it was mandating had to be implemented on a source-by-source basis, and that this process would be expensive for sources. As a result, Congress intended to limit the PSD program to large industrial sources because it was those sources that were the primary cause of the pollution problems in question and because those sources would have the resources to comply with the PSD requirements. Congress’s mechanism for limiting PSD was the 100/250 tpy threshold limitations. Focused as it was primarily on NAAQS pollutants, Congress considered sources that emit NAAQS pollutants in those quantities generally to be the large industrial sources to which it intended PSD to be limited.

That Congress paid careful attention to the types and sizes of sources that would be subject to the PSD program and designed the thresholds deliberately to limit the program’s scope is evident from the legislative history. Several Senate floor statements and the Committee Report made clear that PSD should not apply to small sources. As

discussed later, Congress scrutinized information that EPA provided as to types and sizes of sources, found largely in the Steigerwald-Strelow memorandum. Sen. Muskie stated that the Senate bill excluded “houses, dairies, farms, highways, hospitals, schools, grocery stores, and other such sources.” 123 Cong. Rec. 18021 (June 8, 1977) (statement of Sen. Muskie). Sen. McClure stated that PSD should be limited to “industrial plants of significant impact,” and should exclude “[a] small gasoline jobber, or a heating plant at a community college, [which] could have the potential to emit 100 tons of pollution annually.” 122 Cong. Rec. 24548–49 (July 29, 1976) (statement of Sen. McClure). The Senate Committee Report mirrored Sen. McClure’s statement, and concisely articulated the cost-related basis for the line-drawing: “[The PSD] procedure * * * must include an effective review-and-permit process. Such a process is reasonable and necessary for very large sources, such as new electrical generating plants or new steel mills. But the procedure would prove costly and potentially unreasonable if imposed on construction of storage facilities for a small gasoline jobber or on the construction of a new heating plant at a junior college, each of which may have the potential to emit 100 tons of pollution annually.” S. Rpt. 95–127 at 96–97.

The DC Circuit had occasion, in *Alabama Power*, to acknowledge this legislative history. “Congress’s intention was to identify facilities which, due to their size, are financially able to bear the substantial regulatory costs imposed by the PSD provisions and which, as a group, are primarily responsible for emissions of the deleterious pollutants that befoul our nation’s air.” *Alabama Power*, 636 F.2d at 353. The Court added, “Though the costs of compliance with [the PSD] requirements are substantial, they can reasonably be borne by facilities that actually emit, or would actually emit when operating at full capacity, the large tonnage thresholds specified in section 169(1).” *Id.* at 354.

It is not too much to say that applying PSD requirements literally to GHG sources at the present time—in the absence of streamlining or increasing permitting authority resources and without tailoring the definition of “major emitting facility” or “modification”—would result in a program that would have been unrecognizable to the Congress that designed PSD. Congress intended that PSD be limited to a relatively small number of large industrial sources.

Without phasing in PSD and title V applicability to GHG sources so as to allow the development of streamlining methods and increases in permitting authority resources, the PSD program would expand by January 2, 2011, from the current 280 sources per year to almost 82,000 sources, virtually all of which would be smaller than the sources currently in the PSD program and most of which would be small commercial and residential sources. Until EPA could develop streamlining methods, all of the sources that would become newly subject to PSD—whether they be larger or smaller sources, whether industrial or commercial/residential sources—would have to undergo source-specific BACT determinations for their GHG emissions, as well as their emissions of conventional pollutants in amounts in excess of the significance levels. We estimate that the commercial and residential sources—the great majority of which are small business—would each incur, on average, almost \$60,000 in PSD permitting expenses. This result would be contrary to Congress's careful efforts to confine PSD to large industrial sources that could afford these costs.

A closer look at the legislative history confirms the view that Congress did not expect PSD to apply to large numbers of small sources, including commercial and residential sources, and instead expected the 100/250 tpy thresholds to limit PSD's applicability to larger sources. As noted previously, Congress relied on an EPA memorandum—the Steigerwald-Strelow memorandum—that identified the range of industrial categories that EPA regulated under its program that constituted the precursor to the statutory PSD program, and listed both the estimated number of new sources constructing each year and the amount of pollution emitted by the “typical plant” in the category. The Steigerwald-Strelow memorandum makes clear that the 100 tpy cut-off for the 28 listed sources categories, and the 250 tpy cut-off for all other sources, would exclude from PSD a large number of sources. 122 *Cong. Rec.* 24548–50 (July 29, 1976). However, virtually all, if not all, of the sources in half the 28 source categories emit CO₂ in quantities that equal or exceed the 100 tpy threshold, and almost all of the sources in the remaining categories emit CO₂ in quantities that equal or exceed the 100 tpy threshold. Therefore, applying the “major emitting facility” definition to GHG sources, in the absence of streamlining methods and without tailoring, would, as a practical matter,

vitiating much of the purpose of the 100 tpy cut-off for industrial sources.³⁹

Most telling, in this regard, is the small-sized boilers, which the Steigerwald-Strelow memorandum describes, in terms of size, pollutants emitted, and numbers of sources, as follows: The memorandum identified two categories of these boilers, differentiated by size. The first ranges in size from 10 to 250 x 10⁶ Btu/hr, and has a “typical plant” size of 10⁷ Btu/hr, with “BACT emissions from typical plant” of 53 tpy, and a total of 1,446 sources in that category. The second category ranges in size from 0.3 to 10 x 10⁶ Btu/hr, and has a “typical plant” size of 1.3 x 10⁶ Btu/hr, with “BACT emissions from typical plant” of 2 tpy, and a total of 11,215 sources in the category. That memorandum makes clear that EPA did not believe that sources in these two categories—and especially the smallest one—would be subject to PSD under a 100 tpy threshold, by stating, “Fortunately, most truly small boilers and typical space heating operations would not be covered.” 122 *Cong. Rec.* 24549 (July 29, 1976). However, these data and conclusions were all based on emissions of NAAQS pollutants, the amounts of which placed these boilers well below the PSD threshold limitations. In general, most boilers of these small sizes are fired with natural gas, and a natural gas boiler greater than 0.5 x 10⁶ Btu/hr emits at least 250 tpy CO₂. Therefore, if the CO₂ emissions of these small boilers are considered—as would occur by applying the definition of “major emitting facility” to GHG sources without tailoring—then most of them would in fact be subject to PSD. Again, this result would directly contravene Congress's intention to limit PSD to “industrial plants of significant impact.”

³⁹ Specifically, of the 28 source categories under CAA section 169(1), information available to EPA indicates that all of the sources in the following categories emit at least 100 tpy of CO₂ annually: fossil-fuel fired steam electric plants of more than 250 million Btu per hour heat input, Portland Cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, municipal incinerators capable of charging more than 50 tons of refuse per day, nitric acid plants, petroleum refineries, lime plants, primary lead smelters, fossil-fuel boilers of more than 250 Btus per hour heat input. In addition, all but a few kraft pulp mills and glass fiber processing plants emit at least 100 tpy CO₂ annually. Our information is incomplete with respect to the remaining source categories, but with the possible exception of petroleum storage and transfer facilities with a capacity exceeding three hundred thousand barrels, we suspect that virtually all sources emit at least 100 tpy CO₂ annually. See “Technical Support Document for Greenhouse Gas Emissions Thresholds Evaluation”; Office of Air Quality Planning and Standards; March 29, 2010.

122 *Cong. Rec.* 24548–49 (statement of Sen. McClure).

Perhaps the most compelling reason why applying the PSD program to GHG sources without tailoring, and before the development of streamlining methods, would be inconsistent with congressional intent, is that the resulting program would prove unadministrable. Although the legislative history of the PSD program does not reveal much explicit congressional focus on administrability issues, the Steigerwald-Strelow Memorandum, which identifies the source categories and numbers of sources that were before Congress as it considered PSD, suggests that the program that Congress fashioned could be expected to cover at most a few thousand sources each year. This appears to be approximately the size of the program that EPA administered before the 1977 CAA Amendments, so that it seems reasonable to assume that Congress expected the PSD program it enacted to be within EPA's and the states' administrative capacities.

Moreover, the *Alabama Power* court stressed the importance of administrability concerns: Most importantly, the Court held that EPA, in interpreting the “modification” provisions that apply PSD to physical or operational changes by major emitting facilities that “increase the amount of any air pollutant emitted,” CAA section 111(a)(4), may “exempt from PSD review some emission increases on grounds of *de minimis* or administrative necessity,” and went on to state that in establishing the exemption thresholds, “[t]he Agency should look at the degree of administrative burden posed by enforcement at various *de minimis* threshold levels.” 636 F.2d at 400,405. In addition, the Court based its holding that potential-to-emit for purposes of the applicability thresholds should be defined as emissions at full capacity with implementation of control equipment, in part on its view that with this definition, the number of sources subject to PSD would be manageable:

Though the costs of compliance with section 165 requirements are substantial, they can reasonably be borne by facilities that actually emit, or would actually emit when operating at full capacity, the large tonnage thresholds specified in section 169(1). The numbers of sources that meet these criteria, as we delineate them, are reasonably in line with EPA's administrative capability.

Alabama Power, 636 F.2d at 354. However, applying PSD to GHG sources before streamlining and without tailoring would increase the size of the PSD program at least an order of magnitude beyond what Congress seems

to have expected, which would have been far beyond the “administrative capability” that *Alabama Power* described EPA as having.

Beyond this disconnect with congressional expectations, what is most important is that the extraordinarily large number of permit applications would overwhelm permitting authorities and slow their ability to process permit applications to a crawl. Our best estimate at present is that permitting authorities would need to process almost 82,000 permit applications per year, compared to, at most, 800 in the current PSD program. The total additional workload, in work hours, for PSD permits would be more than 19.5 million more work hours, compared to 150,795 work hours for the current PSD program, and the total additional costs would be over \$1.5 billion, compared with \$12 million for the current PSD program.

At proposal, we noted that the states had estimated that the influx of permit applications that would result from applying the 250 tpy threshold at actual emissions would, without additional resources, result in permitting delays of 3 years. In fact, as we noted at proposal, a literal reading of the PSD requirements would require their application at the 250 tpy PTE level, which would result in ten times more permit applications than were assumed when the states made the 3-year estimate. Further, our current estimates of the numbers of sources that would be subject to PSD requirements are about twice what we estimated at proposal, as described elsewhere. Moreover, our estimate of the number of hours that permitting authorities would need to process a permit application from a source in the commercial or residential sector—which is, by far, the largest single sector—is three and one-half times as long as we estimated at proposal. And under a literal reading of the PSD applicability provisions as applied to GHG sources, the permitting authorities would be required to implement a program of this size beginning on January 2, 2011, less than 9 months from now. We received many comments from states and industry raising concerns about the cost to sources and administrative burdens of PSD permitting if the statutory threshold were to apply for GHG emissions. One commenter estimated a cost of over \$5 billion and the dedication of over 17,000 FTEs to this effort.

We consider it difficult to overstate the impact that applying PSD requirements literally to GHG sources as of January 2, 2011—before streamlining or increasing permitting resources and

without tailoring—would have on permitting authorities and on the PSD program, and we are concerned that this impact could adversely affect national economic development. The number of PSD permits that would be required from such an approach is far beyond what the PSD program has seen to date. It is clear throughout the country, PSD permit issuance would be unable to keep up with the flood of incoming applications, resulting in delays, at the outset, that would be at least a decade or longer, and that would only grow worse over time as each year, the number of new permit applications would exceed permitting authority resources for that year. Because PSD is a preconstruction program, during this time, tens of thousands of sources each year would be prevented from constructing or modifying. In fact, it is reasonable to assume that many of those sources will be forced to abandon altogether plans to construct or modify. As a result, a literal application of the PSD applicability provisions to GHG sources would slow construction nationwide for years, with all of the adverse effects that this would have on economic development.

The remedies for this scenario would be for permitting authorities to increase their PSD funding by over 100-fold, from \$12 million to over \$1.5 billion, or the development by EPA and the permitting authorities of streamlining techniques. But it is not possible for permitting authorities to increase their funding to those levels in the foreseeable future, partly because of the sheer magnitude of those levels and partly because of the financial challenges that states currently face. And, for the reasons discussed later, although streamlining offers genuine promise to improve the manageability of the PSD workload, streamlining cannot do so in the very near term and, in any event, the extent to which it can do so has not yet come into focus.

So clear are at least the broad outlines of this picture that EPA did not receive any substantive comments arguing that permitting authorities could in fact administer the PSD program with the applicability requirements applied literally to GHG sources beginning in the very near future.⁴⁰ Every permitting authority that addressed this issue in their comments on the proposed Tailoring Rule stated unequivocally that it could not administer the PSD program at the statutory levels. To cite a few examples (each of which considered

both the PSD and title V programs together): NACAA, which represents air pollution control agencies in 53 states and territories, stated it “* * * agrees with the EPA that immediately attempting to implement the PSD and title V programs using the statutory thresholds meets the test for invoking the administrative necessity and absurd results doctrines.” Similarly, the California Air Resources Board stated that it “* * * concurs with the United States, EPA that if more appropriate applicability thresholds [as opposed to the statutory thresholds] are not set for GHG it will not be administratively possible to implement these [the PSD and title V] permitting programs.” All other state and local permitting agencies that commented on the proposed tailoring provided similar comments that they would not have the adequate staff capacity or resources to be able to successfully administer their permitting programs with the addition of GHG emission sources at the statutory thresholds for PSD and title V.

It is the many-year delays in permit issuance and the consequent chilling of economic development that provide perhaps the clearest indication that applying the PSD applicability provisions to GHG sources without tailoring produces absurd results. These effects would undermine one of Congress’s central purposes in establishing the PSD program, which was to promote development in clean air areas by large industrial sources (as long as they included environmental safeguards). As discussed previously, this goal is manifest in the structure of the PSD provisions, and Congress even went so far as to make this goal explicit in the purposes section of the PSD provisions.

Moreover, at the present time, there is relatively little environmental benefit in subjecting large numbers of small GHG sources to the expensive, source-by-source PSD permitting requirements. They represent a relatively small share of the GHG inventory and the control options available to them, at present, are limited. As a result, approaches other than source-by-source permitting presently offer more promise for generating emissions reductions in an efficient manner. These approaches, which may be developed through both federal and state efforts, include requirements, incentives, and educational outreach to promote efficiency improvements to boilers and furnaces and energy efficient operations, including, for example, weatherization programs.

For all these reasons, interpreting the definition of “major emitting facility”

⁴⁰ EPA did receive a smaller number of comments that asserted in conclusory fashion that permitting authorities could administer the 100/250 tpy levels.

and “modification” literally—that is, as EPA has interpreted them more narrowly, but without tailoring and before the program requirements can be streamlined or permitting authority resources can be increased—would produce results that are not consonant with, and, in fact, would severely undermine, Congress’s purpose for the PSD program. These results may fairly be characterized as the type of absurd results that support our view that the literal terms of the PSD applicability provisions do not indicate congressional intent for how those provisions should be applied to GHG sources.

b. Congressional Intent for the Applicability Provisions

(1) Congressional Intent for Whether and How PSD Applies to GHG Sources

Several of the PSD provisions and statements in the legislative history are particularly important in determining whether and how the PSD program should apply to GHG sources, as discussed elsewhere:

(1) The applicability provisions, under CAA section 165(a) and 169(1). These provisions are written broadly, and although, as we explain above, they cannot be read literally to apply to GHG sources at or above the 100/250 tpy, they nevertheless can be read to indicate that directionally, Congress intended that PSD be applied inclusively.

(2) The various PSD provisions that identify the pollutants subject to PSD. Compare, e.g., CAA sections 162, 163, 164, 165(a)(3), 165(d)(2), 165(e), and 166 (NAAQS pollutants) with CAA sections 165(a)(3)(C), 165(a)(4) (other pollutants). These provisions indicate that a major purpose of the PSD program is to control NAAQS pollutants, but that the program also covers non-NAAQS pollutants.

(3) The requirement that permitting authorities act on PSD applications within 1 year. CAA section 165(c). This provision indicates that Congress anticipated the PSD program would be of a size that would allow permitting authorities to meet this deadline.

(4) The purpose provision. CAA section 160. This provision makes clear that PSD is designed both to protect public health and welfare and to promote economic growth.

(5) In addition, we consider important the legislative history indicating the Congress intended PSD to apply to large industrial sources because they were the primary source of the air pollution problems and they have the resources to manage the demands of the PSD permitting process; and that, by the same token, Congress expected that

small sources would not be subject to PSD. The legislative history does not specifically mention GHG sources. Looking at these provisions and the legislative history together, we think Congress can be said to have intended that the PSD program apply to GHG sources as a general matter. The most important indication of congressional intent in this regard is the applicability provisions, which provide, in part, that PSD applies to (i) “any * * * source[that] emit[s], or ha[s] the potential to emit [the specified quantity] of any air pollutant,” CAA section 169(1); and (ii) to any such source that undertakes a physical or operational change that “increases the amount of any air pollutant emitted.” CAA section 169(2)(C), 111(a)(4). These terms are quite broad, and should be read to include GHG sources and GHGs. See *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007) (“Because greenhouse gases fit well within the Clean Air Act’s capacious definition of ‘air pollutant,’ we hold that EPA has the statutory authority to regulate the emission of such gases from new motor vehicles.”). Moreover, including GHG sources—under certain circumstances—is consistent with the PSD provisions that refer to other pollutants, establish the time-frame for acting on PSD applications, and establish the overall purpose of the program. In addition, including GHG sources—again, under certain circumstances—is consistent with the legislative history that PSD be limited to sources that cause a meaningful part of the air pollution problem and have the resources to manage the PSD requirements. No PSD provision explicitly imposes any limitation of PSD to large industrial sources, and Congress’s reasoning for focusing on large industrial sources—which was that these sources are best suited to handle the resource-intensive analyses required by the PSD program—could extend to GHG sources under certain circumstances (that is, large sources first, and smaller sources after streamlining methods are developed). Similarly, as discussed previously, it is reasonable to read into Congress’s intent that the PSD program be limited to a size that permitting authorities would be able to administer, but it is consistent with that reading to recognize that the permitting authorities could take certain steps—including adoption of streamlining measures and ramping up resources—that would allow them to handle a higher volume of permitting. Finally, we find nothing in the PSD provisions or legislative history that would indicate congressional intent to

exclude GHG sources. Accordingly, we believe that Congress must be said to have intended an affirmative response for whether PSD applies to sources of GHGs as a general matter. Our previous regulatory action defining the PSD applicability provisions made this clear, and we do not reopen this issue in this rulemaking. Moreover, even if this long-established regulatory position were not justifiable based on *Chevron* Step 1—on the grounds that in fact, congressional intent on this point is not clear—then we believe that this position, that the statutory provisions to apply PSD to GHG sources in general, was justified under *Chevron* Step 2.

As to how PSD applies to GHG sources, although, for reasons discussed previously, the 100/250 tpy threshold provision, which establishes the scope of PSD applicability, should not be read as applying literally to GHG sources—and as a result, the applicability provision as a whole cannot be said to have a plain meaning as to the scope of coverage of GHG sources—we believe that the applicability provisions and legislative history nevertheless indicate a congressional intent for how PSD should apply to GHG sources. That is to apply PSD to as many sources as possible as quickly as possible, at least to a certain point. We believe that this intent can be inferred from the inclusiveness of the applicability provision, combined with the legislative history that focuses on Congress’s desire to include in the PSD program sources that have the resources to comply with the requirements and, as the Court in *Alabama Power* recognized, Congress’s concern about administrability. That is, at first, PSD may apply to the largest GHG sources because they may be expected to have the resources to comply with PSD’s requirements and permitting authorities may be expected to accommodate those sources; and over time, with streamlining and increases in permitting authority resources, PSD may apply to more GHG sources. As discussed later, the tailoring approach is consistent with congressional intent in this regard.

We recognize the tension between the applicability provisions, which are inclusive, and the statements in the legislative history that express Congress’s expectation that PSD be limited to large industrial sources. At least to a point, the applicability provisions and these statements can be reconciled by recognizing that the reason why Congress expected that PSD would be limited to large industrial sources was that Congress recognized that PSD applied on a source-by-source basis, that this would be costly to

sources, and that only the large industrial sources could afford those costs. Taking certain actions—including streamlining PSD requirements—can render PSD more affordable and thereby allow its application to smaller sources in a more cost-effective manner. In this way, PSD's inclusive applicability provisions can be reconciled with the narrower scope Congress expected, and this is part of the reason why we characterize congressional intent as being consistent with phasing in the applicability of PSD to GHG sources through the tailoring approach.⁴¹

On the other hand, if Congress cannot be said to have expressed an intent as to the manner and scope of PSD applicability to GHG sources, then, under *Chevron* Step 2, EPA may apply a reasonable interpretation of the applicability provisions to determine the scope of coverage of GHG sources that is consistent with the statutory requirements. The Tailoring Rule is a reasonable interpretation under *Chevron* Step 2. It is consistent with (1) The applicability provisions, recognizing that as we have seen, those provisions cannot be applied literally under these circumstances;⁴² (2) the provisions described above concerning which pollutants the PSD provisions cover and the timetable for permitting authority action on PSD applications; (3) the purpose provisions of PSD, and the accompanying legislative history, because it protects public health and welfare without inhibiting economic development; and (4) the legislative history indicating Congress intended that PSD be limited to sources that cause a meaningful part of the problem

⁴¹ Reconciling the applicability provisions with the statements in the legislative history in this manner is also consistent with the U.S. Supreme Court's view that the Clean Air Act has inherent flexibility, as it stated in *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007):

While the Congresses that drafted § 202(a)(1) might not have appreciated the possibility that burning fossil fuels could lead to global warming, they did understand that without regulatory flexibility, changing circumstances and scientific developments would soon render the Clean Air Act obsolete. The broad language of § 202(a)(1) reflects an intentional effort to confer the flexibility necessary to forestall such obsolescence. See *Pennsylvania Dept. of Corrections v. Yeskey*, 524 U.S. 206, 212 (1998) (“[T]he fact that a statute can be applied in situations not expressly anticipated by Congress does not demonstrate ambiguity. It demonstrates breadth” (internal quotation marks omitted)).

⁴² For the reasons discussed above, we believe that Step 2 of the *Chevron* framework, which authorizes the exercise of agency discretion as long as the agency remains consistent with a reasonable construction of the statute, does not require a literal construction of the statute in a case such as this one, in which the “absurd results” doctrine applies so that the statutory requirements cannot be read literally.

and can manage its requirements, because it will expand PSD's applicability only after streamlining methods and greater permitting authority resources will allow for such an expansion in an orderly manner.

(2) Criteria for Establishing Phase-in Schedule

The specific phase-in schedule under the tailoring approach will depend on several things. The first is our progress in developing streamlining methods that will render the permitting authority workload more manageable by taking some sources off the table (through regulations or guidance interpreting PTE), and by allowing for more efficient permit processing (through general permits and presumptive BACT). At the same time, streamlining techniques will lower permitting costs to sources or even eliminate some sources' obligations to obtain permits altogether. The second is the time that permitting authorities need to ramp up their resources in an orderly and efficient manner to manage the additional workload. The third is information we have as to the sources' abilities to meet the requirements of the PSD program and the permitting authorities' ability to process permits in a timely fashion. That information will be based on the real-world experience the permitting authorities will accumulate as they proceed to process permit application for the larger GHG sources.

Thus, under our present approach, we will develop streamlining techniques, we expect the permitting authorities to ramp up resources in response to the additional demands placed upon them in the first two steps, and we will gather real-world information about the GHG permitting process; and based on all that, we will address expanding the PSD program in a step-by-step fashion to include more sources over time. We intend to follow this process to establish both the PSD applicability thresholds and, as we describe next, the significance levels.

(3) Criteria for Establishing Significance Levels⁴³

The criteria for establishing the significance levels are the same as for establishing the “major emitting facility” thresholds. As noted previously, under

⁴³ It should be noted that strictly speaking, we do not, in our drafting of the regulatory revisions that are part of this rulemaking, establish a significance level for GHG emissions based on CO₂e. Rather, we establish an applicability criteria for determining whether GHGs are subject to regulation with respect to the particular source. We explain our approach in more detail in the Response to Comments document. Throughout this preamble, we refer to this action, for convenience, as a significance level.

the applicable CAA sections, any physical or operational change at a stationary source that “increases the amount of any air pollutant emitted by such source” or that results in the emission of a new pollutant is treated as a “modification” that is subject to PSD requirements. Although the CAA, by its terms, treats as an “increase” any amount of emissions that is greater than zero, the DC Circuit held in *Alabama Power v. Costle* that EPA may establish a threshold—called the significance level—on *de minimis* grounds for the amount of any particular pollutant that may be increased. 636 F.2d at 400.

Of particular importance, the Court in *Alabama Power* indicated that EPA may rely on administrative considerations to establish significance levels. *Id.* To reiterate, the Court held that “EPA does have discretion, in administering the statute's ‘modification’ provision, to exempt from PSD review some emission increases on grounds of *de minimis* or administrative necessity.” 636 F.2d at 400. The Court added a more detailed exposition of its views in a subsequent part of its opinion, where it discussed the BACT provision, under CAA section 165(a)(4), and the Court made clear that those views applied as well to the “modification” provision. There, the Court invalidated an EPA regulation that established a 100- and 250-tpy exemption from the BACT requirement. Both the BACT provision and the modification provision apply by their terms to all emissions from a source, but the Court stated that each provision must be read to incorporate an exemption based on *de minimis* or administrative considerations, and explained:

We understand that the application of BACT requirements to the emission of all pollutants from a new facility, no matter how miniscule some may be, could impose severe administrative burdens on EPA, as well as severe economic burdens on the construction of new facilities. But the proper way to resolve this difficulty is to define a *de minimis* standard rationally designed to alleviate severe administrative burdens, not to extend the statutory 100 or 250-ton threshold to a context where Congress clearly did not apply it. Just as for the applicability of PSD to modifications, the *de minimis* exemption must be designed with the specific administrative burdens and specific regulatory context in mind. This the Agency has failed to do. We do not hold that 100 tons per year necessarily exceeds a permissible *de minimis* level; only that the Agency must follow a rational approach to determine what level of emission is a *de minimis* amount.

A rational approach would consider the administrative burden with respect to each statutory context: what level of emission is *de minimis* for modification, what level *de minimis* for application of BACT. Concerning

the application of BACT, a rational approach would consider whether the *de minimis* threshold should vary depending on the specific pollutant and the danger posed by increases in its emission. The Agency should look at the degree of administrative burden posed by enforcement at various *de minimis* threshold levels. It is relevant that our decision requires the Agency, in its evaluation of emissions of facilities, to take into account the facility's air pollution controls. It may also be relevant, though it is certainly not controlling, that Congress made a judgment in the Act that new facilities emitting less than 100 or 250 tons per year are not sizeable enough to warrant PSD review.

Id. at 405. As just quoted, the Court acknowledged the 100 and 250 tpy thresholds for a major emitting facility, and did not indicate whether the modification exemption level could exceed those statutory levels, but nevertheless, the Court made clear that EPA may "consider the administrative burden" associated with modifications to establish an exemption level for modifications.

EPA has established significance levels for various pollutants, generally relying on a *de minimis* basis. *See, e.g.*, 45 FR 52676, 52705–52710 (August 7, 1980). In these actions, EPA generally established the level based on the triviality of the amount of emissions excluded. To this point, we have not attempted to determine *de minimis*—that is, trivial—levels for GHGs. Instead, in this rulemaking, EPA is establishing a phase-in schedule for significance levels based on the *Chevron* framework, accounting for the "absurd results," "administrative necessity," and "one-step-at-a-time" doctrines. It is not necessary to establish a permanent *de minimis* level in this rulemaking. For one thing, the Court in *Alabama Power* explicitly authorized an administrative basis for significance levels. Moreover, were EPA to establish a *de minimis* level, that amount could be below—perhaps even well below—the "major emitting facility" thresholds established in this rulemaking on grounds of "administrative necessity" and the other doctrines. Accordingly, at present, if we were to establish a permanent significance level on a *de minimis* basis, that level could result in too many small sources being required to submit permit applications while the phase-in is occurring. This would give rise to the same problems concerning undue costs to the sources and administrative burdens for the permitting authorities for which we are fashioning a remedy. Accordingly, the significance levels we establish with this action are the lowest levels that sources and permitting authorities can reasonably be expected

to implement at the present time in light of the costs to the sources and the administrative burdens to the permitting authorities.

c. Other Possible Approaches to Reconciling a Literal Reading of PSD Applicability Provisions and Congressional Intent

Commenters have suggested another approach to reconciling the inconsistency between the definition of "major emitting facility" and congressional intent. They urge that the "major emitting facility" definition should be applied so that only sources that emit NAAQS pollutants, for which the area is designated attainment or unclassifiable, in the requisite quantities would be subject to PSD, and sources would not be subject to PSD based solely on their emissions of non-NAAQS pollutants or a NAAQS pollutant for which an area has been designated nonattainment. Some commenters argue that this approach is mandated by several of the PSD provisions, read together or at least that the relevant statutory provisions are ambiguous and that this approach is a reasonable reading of them. Under this approach, we would not need to phase in the application of PSD by lowering the applicability threshold for GHG emitters.

Specifically, many commenters have questioned whether EPA has the authority to regulate GHGs under the PSD provisions. Although the specific lines of reasoning vary somewhat from one commenter to another, in general, they based their arguments largely on CAA sections 161 and 165(a). Under CAA section 161:

In accordance with the policy of section 101(b)(1), each applicable implementation plan shall contain emission limitations and such other measures as may be necessary, as determined under regulations promulgated under this part, to prevent significant deterioration of air quality in each region (or portion thereof) designated pursuant to section 107 as attainment or unclassifiable.

Commenters point out that section 107 applies only to NAAQS pollutants and directs that areas be designated as attainment, nonattainment, or unclassifiable on a pollutant-by-pollutant basis. Under CAA section 165(a), a "major emitting facility" cannot be constructed "in any area to which this part applies" unless it meets certain requirements. According to some commenters, these provisions, read together, limit PSD's applications to only NAAQS pollutants that are emitted from sources in areas that are designated attainment or unclassifiable for those pollutants. Other comments make a

similar point, except to state that PSD applies more broadly to pollutants with a local, ambient impact.

Some commenters go on to take the position that NAAQS pollutants for which the area is designated attainment or unclassifiable are the only pollutants that can be regulated under any provision of the PSD requirements; while others take the position that once PSD is triggered for a source on the basis of its NAAQS pollutants, then other, non-NAAQS, pollutants may be regulated under certain PSD provisions, in particular, the BACT provision under CAA section 165(a)(4). These commenters agree, however, that emissions of GHGs, by themselves, cannot trigger PSD applicability. Finally, some commenters state that even if the PSD provisions cannot be read by their terms to preclude GHGs from triggering PSD, then they can be read to authorize EPA to determine that GHG emissions do not trigger PSD.

We recognize, as we have said elsewhere, that a major purpose of the PSD provisions is to regulate emissions of NAAQS pollutants in an area that is designated attainment or unclassifiable for those pollutants. However, we do not read CAA sections 161 and the "in any area to which this part applies" clause in 165(a), in the context of the PSD applicability provisions, as limiting PSD applicability to those pollutants. The key PSD applicability provisions are found in sections 165(a) and 169(1). Section 165(a) states, "No major emitting facility on which construction is commenced after August 7, 1977, may be constructed in any area to which this part applies unless [certain requirements are met]." A "major emitting facility" is defined, under CAA section 169(1), as "any * * * stationary source[s] which emit[s], or ha[s] the potential to emit, one hundred [or, depending on the source category, two hundred fifty] tons per year or more of any air pollutant." As discussed elsewhere, EPA has long interpreted the term "any air pollutant" to refer to "any air pollutant subject to regulation under the CAA," and for present purposes, will continue to read the "subject to regulation" phrase into that term.

Although section 165(a) makes clear that the PSD requirements apply only to sources located in areas designated attainment or unclassifiable, it does not, by its terms, state that the PSD requirements apply only to pollutants for which the area is designated attainment or unclassifiable. Rather, section 165(a) explicitly states that the PSD requirements apply more broadly to any pollutant that is subject to regulation. Moreover, another

requirement in CAA section 165(a) also applies to air pollutants broadly. Under CAA section 165(a)(3), one of the requirements for securing a preconstruction permit is to demonstrate that the source's emissions "will not cause, or contribute to, air pollution in excess of any (A) maximum allowable increase or maximum allowable concentration for any pollutant in any area [to which the PSD requirements apply], (B) [NAAQS] in any air quality control region, or (C) any other applicable emission standard or standard of performance under this chapter." As just quoted, subparagraph (C), by its terms clearly applies to non-NAAQS pollutants. This is because it refers to (1) "any other applicable emission standard," which distinguishes it from subparagraph (B) and therefore from NAAQS pollutants; and (2) "any * * * standard of performance under this chapter," which refers to standards of performance under section 111, several of which are for non-NAAQS pollutants. *See, e.g.*, 40 CFR 60.33c(a) "municipal solid waste landfill emissions." By the same token, CAA section 110(j) specifically contemplates that a source required to hold a permit under title I of the Act, which includes a PSD permit, demonstrate that the source complies with "standards of performance," which may include requirements for pollutants other than NAAQS.

In addition, CAA section 163(a)(4) includes as a PSD requirement that "the proposed facility is subject to the best available control technology for each pollutant subject to regulation under this chapter emitted from, or which results from, such facility." Section 163(a)(4)'s broad reference to "each pollutant subject to regulation under this chapter" clearly indicates that it applies to non-NAAQS pollutants, as long as they are regulated under other provisions of the Act.⁴⁴ The DC Circuit, in *Alabama Power v. Costle*, 636 F.2d 323, 361 n.90 (DC Cir. 1980) indicated that, under the law applicable at the time the Court handed down the decision in 1980, PSD applies to HAPs.⁴⁵

⁴⁴ We find no support for the proposition raised by some commenters that this provision is limited to "NAAQS" pollutants. To the contrary, "under this chapter" unambiguously signals an intent to cover any pollutant regulated under the Act. Had Congress intended a narrower focus, they would have specified "any NAAQS pollutant" or any pollutant subject to regulation under this Part (PSD).

⁴⁵ In the 1990 CAA Amendments, Congress added section 112(b)(6), which provides that PSD "shall not apply to pollutants listed under this section," that is, HAPs.

In addition, PSD requirements are part of SIPs, and although SIPs generally are limited to provisions that implement the NAAQS, and therefore generally are limited to controlling NAAQS pollutants (or non-NAAQS pollutants that affect ambient air quality), *see generally* CAA section 110, Congress explicitly required SIPs to include requirements to protect visibility, under CAA section 169A–B. *See* CAA sections 110(a)(2)(D)(i)(II), 169A(b)(2)(A). Congress took much the same approach with the PSD program, which was to require that PSD requirements be included in the SIPs, but to explicitly require that PSD apply to non-NAAQS pollutants.

These provisions—sections 165(a)(3), 165(a)(4), and 110(j)—all indicate by their terms that PSD requirements apply to non-NAAQS pollutants. As such, they lend credence to our view that Congress intended the PSD applicability provisions to include GHG sources. At the very least, they demonstrate that Congress certainly knew how to specifically describe certain air pollutants—*e.g.*, "air pollution in excess of * * * any other applicable emission standard or standard of performance under this chapter," CAA section 165(a)(3)(C)—which indicates that its decision not to specifically describe air pollutants in the applicability provisions suggests an intent to cover air pollutants broadly.

To return to sections 161 and the "in any area to which this part applies" phrase in 165(a), which commenters rely on as the cornerstone of their argument, commenters in effect take the position that Congress intended the geographic references in these provisions—that is, the references to areas designated as attainment or unclassifiable—to limit the scope of the permitting provisions. We think it unpersuasive that Congress would have taken such an indirect, and silently implied, route to limit the scope of the permitting provisions. As noted previously, the permitting provisions apply broadly by their terms. Had Congress intended to limit PSD permitting in the manner urged by commenters, it certainly could have done so directly, such as by limiting PSD permitting to "any pollutant for which an area is designated attainment or unclassifiable." Indeed, Congress did so in other PSD provisions, discussed previously. Similarly, in other sections of the CAA, Congress also directly limited the scope of pollutant applicability by specifying which pollutants are or are not subject to the provision. *See, e.g.*, section 111(d) (performance standards for existing

sources apply only to pollutants other than NAAQS or HAPs), section 112(a)(1) (applying air toxics requirements in section 112 to sources that emit above the specified tonnage thresholds of "hazardous air pollutants").

In addition, although section 161 requires that SIPs contain emission limitations and other measures as necessary to prevent significant deterioration in areas designated as attainment or unclassifiable, it does not by its terms limit SIPs to only those measures.

Most broadly, we read the PSD provisions and their legislative history to evidence Congress's intent that PSD apply throughout the country to large sources that undertake new construction or modifications, and that Congress's overall purpose was to assure that, as the industrial stock of the nation turned over, it would become cleaner for all air pollutants emitted. Greenhouse gas sources, as a general matter, fit readily into this overall vision. At the time that Congress enacted the PSD provisions in 1977, every area of the nation was designated attainment or unclassifiable for at least one air pollutant, and that has remained the case to the present time. Accordingly, at all times, PSD has applied in every area of the country. The PSD requirements clearly cover all air pollutants emitted by the source, and provide a process for reviewing those emissions and determining BACT for them under CAA section 165(a)(4). It is true that at the time Congress adopted the PSD provisions, it was primarily concerned about the NAAQS pollutants—or, as some commenters assert, pollutants with local, ambient impact—because those pollutants represented a major component of the air pollution problems it was aware of and was addressing. But its overall purpose was broad enough to cover additional pollutants; the process it enacted for establishing BACT was broad enough to encompass additional pollutants; and the applicability provisions it established were phrased broadly enough to encompass additional pollutants, *see* section 169(1). As a result, we believe that the PSD applicability provisions, which, again, refer to, as we have interpreted them, "any air pollutant [subject to regulation under the CAA]," should be seen as "capacious" and therefore encompass GHG sources, in much the same manner as the U.S. Supreme Court viewed the definition of "air pollutant" to be "capacious" and therefore encompass GHGs. *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007).

In addition, it should not be overlooked that we have applied PSD to

non-NAAQS pollutants since the inception of the program over 30 years ago. For example, prior to the 1990 CAA Amendments, PSD applied to HAPs regulated under CAA section 112; and over the years, EPA has established significance levels for fluorides, sulfuric acid mist, hydrogen sulfide, TRS, reduced sulfur compounds, municipal waste combustor organics, municipal waste combustor metals, municipal waste combustor acid gases, and municipal solid waste landfill emissions, *see* 40 CFR 51.166(b)(23)(i); and EPA has proposed a significance level for ozone depleting substances. *See* 61 FR 38307 (July 23, 1996). Of course, the basis for all these actions is PSD's applicability to these non-NAAQS air pollutants. We are not aware that EPA's actions in establishing significance levels for these pollutants gave rise to challenges on grounds that the PSD provisions do not apply to them. As the U.S. Supreme Court recently stated in upholding an EPA approach in another context: "While not conclusive, it surely tends to show that the EPA's current practice is a reasonable and hence legitimate exercise of its discretion * * * that the agency has been proceeding in essentially this fashion for over 30 years." *Entergy Corp. v. Riverkeeper, Inc.*, 129 S.Ct. 1498, 1509 (2009) (citations omitted).

Finally, we note that excluding GHG sources from PSD applicability would create inequitable results. Consider the hypothetical case of two sources that construct in the same area, each of which emits the same amount of GHGs, and that amount is large enough to trigger PSD applicability. Assume that the first one, but not the second, also emits NAAQS pollutants amounts large enough to trigger PSD applicability. If GHG sources are excluded from PSD applicability, then the first of those sources, but not the second, would be subject to PSD requirements for its GHG emissions. Similarly, consider the hypothetical case of two sources that emit identical amounts of the same NAAQS pollutant and identical amounts of GHGs, all amounts of which are large enough to trigger PSD applicability requirements. Assume that the first source constructs in an area that is an attainment or unclassifiable area for the NAAQS pollutant that it emits, and that the second source constructs in an area that is not an attainment or unclassifiable area for that NAAQS pollutant. Here again, if GHG sources are excluded from PSD applicability, then the first of those sources, but not the second, would be subject to PSD

requirements for its GHG emissions. These results are inequitable and would create an uneven playing field and for this reason, too, support our view that the PSD applicability provisions apply to GHG sources.

Accordingly, we reject the argument that section 165 must be, or may reasonably be, limited in scope to pollutants for which an area has been designated as attainment or unclassifiable. Rather, the PSD applicability provision—the definition of "major emitting facility" in CAA section 169(1)—applies by its terms (as we have interpreted them narrowly through regulation) to sources emitting any air pollutant subject to regulation, and is not limited to any NAAQS air pollutant. Our research has not disclosed any explicit statements in the legislative history that Congress intended to limit PSD applicability to sources of NAAQS pollutants.

6. Application of the "Absurd Results" Doctrine for the Title V Program

Having discussed the application of the *Chevron* framework, taking account of the "absurd results" doctrine, for the PSD applicability requirements, we now turn towards applying the same approach to the title V applicability requirements. Because of the parallels between the PSD and title V applicability provisions, much of the discussion later parallels the previous discussion of PSD. As with PSD, we finalize, with some refinements, the "absurd results" basis we proposed. Specifically, we are revising our regulations to limit title V applicability to GHG emitting sources by revising the regulatory term, "major source," and although our revised regulations do not accord with a literal reading of the statutory provisions for title V applicability, which are incorporated into the statutory definition of "major source," we have concluded that based on the "absurd results" doctrine, a literal adherence to the terms of this definition is not required. Rather, we may apply title V to GHG sources in a phased-in manner, as we do through the tailoring approach, because although congressional intent is clear that title V applies to GHG sources in general, congressional intent is unclear on the question of how title V applies, and the tailoring approach is a reasonable interpretation of the statute.

To reiterate, for convenience, the title V applicability provisions provide that after the effective date of a title V program, it is unlawful for any person to operate a "major source" without a title V permit (CAA section 502(a), and define a "major source" to include "any

major stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant." CAA sections 501(2)(B) and 302(j).

Under the current interpretation of the title V applicability provisions, EPA's recent promulgation of the LDVR will trigger the applicability of title V for GHG sources at the 100 tpy threshold levels as of January 2, 2011. This is because title V applicability hinges on the definition of "major source," which, under EPA's long-standing narrowing interpretation, but absent further tailoring, applies title V to sources of any air pollutant that is subject to regulation under another provision of the CAA. EPA's promulgation of the LDVR means that GHGs will become subject to regulation on the date that the rule takes effect, which will be January 2, 2011.

But absent tailoring, the January 2, 2011 trigger date for GHG PSD applicability will see an extraordinarily large number of sources—some 6.1 million—become subject to title V, an increase of over 400-fold over the 14,700 sources that currently are subject to title V. The great majority of these will be small commercial or residential sources.

We believe that for many reasons, this result is contrary to congressional intent for the title V program, and in fact would severely undermine what Congress sought to accomplish with the program. As a result, under *Chevron*, accounting for the "absurd results" doctrine, the statutory definition for "major source" (as EPA has already narrowed it to refer to any air pollutant "subject to regulation") should not be read to apply to all GHG sources at or above the 100 tpy threshold as of the January 2, 2011 date. Rather, the definition of "major source" should be tailored so that it applies to GHG sources on a phased-in basis, with the largest sources first, as we describe in this rule.

a. Congressional Intent for the Title V Program

As we said, previously, in a similar circumstance involving the PSD program, applying title V requirements to GHG sources without tailoring the definition of "major source"—and, as discussed later, without streamlining the title V requirements or allowing for time for permitting authorities to ramp up resources—would result in a program unrecognizable to the Congress that enacted title V, and one that would be flatly unadministrable. Without tailoring, the PSD program would expand from the current 14,700 sources to some 6.1 million, with the great

majority of the sources being small commercial and residential sources that not only have never been permitted before, but that in many cases have no applicable requirements under the CAA to include in the permit. In the next several sections, we will describe some of the specific ways that this literal application of title V would not only differ from, but would undermine, congressional intent. But the big picture is readily drawn: The influx of millions of permit applications would do nothing less than overwhelm the program Congress finely crafted for thousands of sources, with its multi-step deadlines measured in days and months, its multiple mandates for expeditious permit processing, its nuanced limitations on the need for permit revisions, its efforts to save smaller sources permit fees. Regulatory gridlock, precisely what Congress strove to avoid, would result.

Most visibly, interpreting the applicability provisions literally to include GHG sources at the 100 tpy level immediately would revise the program from what Congress envisioned in three major ways, the legislative history of each of which was discussed previously:

- It would immediately expand the program to cover several-hundred-fold more sources than Congress anticipated.
- It would immediately expand the program to cover very small sources that Congress expected would not be included in the program.
- It would immediately expand the program so that a large number of sources have empty permits, that is, permits without applicable requirement, and undermine the implementation of the program for sources with applicable requirements.

Revising the program in this way through a literal interpretation of the applicability provisions—without tailoring the applicability requirements and without streamlining the program requirements—is clearly inconsistent with Congress's conception of the program's scope, and these inconsistencies are foundational. Most importantly, the program that would result would be unduly costly to sources and impossible for permitting authorities to implement, and therefore would frustrate the purposes that Congress intended to achieve with the program that it did design.

As discussed previously, Congress was fully aware that with the title V program, it was subjecting sources and permitting authorities to additional costs and administrative burdens, and it was fully aware of concerns that absent careful design, the program could

become a formula for regulatory gridlock. Determined to make the program workable, Congress crafted the provisions to be efficient and workable.

However, if title V were to apply to GHG sources at the 100 tpy level, until EPA could develop streamlining methods, all of these sources newly subject to title V would need to apply for permits. We estimate that the commercial and residential sources would incur, on average, expenses of \$23,175, while an industrial source would incur expenses of \$46,350, to prepare a permit application and receive a permit. The great majority of these sources would be small commercial and residential sources of the type that Congress did not expect would be included in title V. For example, as discussed above, the legislative history of title V, including both the permit program under CAA sections 501–506 and the “small business stationary source technical and environmental compliance assistance program” under CAA section 507, indicated that Congress did not expect that “printers, furniture makers, dry cleaners, and millions of other small businesses” would become subject to title V. House Committee Report, H.R. 101–590, at 354. These sources generally do not have the potential to emit conventional pollutants at or above the 100 tpy threshold.⁴⁶ However, many do have the potential to emit GHGs above that threshold. Many printers and furniture makers use a variety of combustion equipment that has the potential to emit at least 100 tpy CO₂, and many commercial dry cleaners have gas-fired driers that have the potential to emit at least 100 tpy of CO₂. All told, there are in fact “millions of * * * small businesses” that would become subject to title V—of the 6.1 million sources that would become subject to title V, the great majority are small businesses—if the title V applicability provisions are applied literally to GHG sources.

Moreover, the overall cost to all 6.1 million sources—before the development of streamlining methods—would be a staggering \$49 billion per year over a 3 year period. Imposing

⁴⁶ As noted previously, the fact that some small sources are subject to title V because they are “major sources” of HAPs or certain area sources and therefore are covered under CAA sections 502(a) and 501(2)(A) does not alter the conclusion from the legislative history that Congress did not expect large numbers of small sources to become subject to title V. The fact that Congress authorized the Administrator to exempt area sources from the title V program where compliance with title V would be “impracticable, infeasible, or unnecessarily burdensome” reinforces the conclusion that Congress did not intend the program to be “impracticable, infeasible or unnecessarily burdensome” for small sources.

burdens of this magnitude on these sources—individually and in total—would of course be contrary to Congress's efforts to minimize the expenses of title V, especially to small sources. The magnitude of the costs is, in a sense, heightened because a great many of these sources will not have applicable requirements to include in their permits; therefore, much of the costs will produce relatively little benefit.

Yet, the most important reason why applying the title V program to GHG sources without tailoring, and before the development of streamlining methods, would be inconsistent with congressional intent, is that the resulting program would prove unadministrable. Adding some 6.1 million permit applications to the 14,700 that permitting authorities now handle would completely overwhelm permitting authorities, and for all practical purposes, bring the title V permitting process to a standstill.

The costs to permitting authorities of this multi-million-source program would again be staggering. On average, and without streamlining, a permitting authority would expend 214 hours, which would cost \$9,844, to issue a permit to a commercial or residential source; and 428 hours, which would cost \$19,688, to issue a permit to an industrial source. In all, permitting authorities would face over \$21 billion in additional permitting costs each year due to GHGs, compared to the current program cost of \$62 million each year.

Beyond this disconnect with congressional expectations as to scope of the program, the extraordinarily large number of permit applications would overwhelm permitting authorities and slow their ability to process permit applications to a crawl. As described at proposal, the survey of permitting authorities conducted by NACAA found that a literal application of the title V applicability provisions to all GHG sources would result in permitting delays of some 10 years. However, as we further noted at proposal, this estimate was based on the assumption that the applicability threshold would be 100 tpy based on actual emissions; in fact, the applicability threshold would be 100 tpy based on PTE, which would sweep in many more sources. Moreover, as stated elsewhere, we currently estimate the amount of per-permit work hours for permitting authorities in processing title V permit applications to be several times higher than what we estimated at proposal. As with PSD, such a program would be beyond anything within our experience, and it is difficult to give a meaningful estimate

for how long the permitting process would take for each permit on average. But it is clear that the period would be many years longer than even the 10 years estimated by NACAA.

In addition, applying title V to all GHG sources without tailoring would be in tension with a specific CAA requirement, that of CAA section 503(c), which imposes a time limit of 18 months from the date of receipt of the completed permit application for the permitting authority to issue or deny the permit. It would be impossible for permitting authorities to meet this statutory requirement if their workload increases from some 14,700 permits to 6.1 million, and without streamlining. Instead, as just noted, permit applications would face multi-year delays in obtaining their permits.

Moreover, these delays would undermine the overall statutory design that promotes the smooth-running of the permitting process, and the underlying purpose of the title V program itself. As noted elsewhere, Congress intended through title V to facilitate sources' compliance with their CAA obligations by establishing an operating permit program that requires the source to combine all of its CAA requirements, and explain how it will assure compliance with such requirements. Congress established a comprehensive process to implement the operating permit program. Through this process, following the date that sources become subject to title V, they have 1 year to submit their permit applications. CAA section 503(c). As noted, the permitting authority then has 18 months to issue or deny the permit. CAA section 503(c). Permitting authorities must provide an opportunity for public comment and a hearing. CAA section 502(b)(6). If the permitting authority proposes to issue the permit, the permitting authority must submit the permit to EPA for review, and notify affected states. CAA section 505(a)(1). EPA then has 45 days to review the permit and, if EPA deems it appropriate, to object to the permit. CAA section 503(b)(1). If EPA does object, then the permitting authority must, within 90 days, revise it to meet the objections, or else EPA becomes required to issue or deny the permit. CAA section 503(c). If EPA does not object, then, within 60 days of the close of the 45-day review period, any person may petition EPA to object, and EPA must grant or deny the petition within 60 days. CAA section 505(b)(2). This set of applicant, permitting authority, and EPA actions and deadlines establishes the process for the prompt and efficient issuance of operating permits for the appropriate universe of sources.

But at least for an initial period, until resources could be ramped up and streamlining methods could be developed, the extraordinary numbers of these permit applicants would sweep aside this carefully constructed program, and instead, backlog the permit authorities. This initial period would last for many years. As discussed elsewhere, it would take several years to develop and apply streamlining measures—in particular, general permits—and during that time, the permit backlog would grow so large that it would take many more years for permitting authorities to catch up by raising the requisite funds and hiring and training the necessary employees.

What's more, only a fraction of these millions of sources newly covered by title V will be subject to any CAA requirements due to their GHG emissions, and we suspect that a larger number will not be subject to any CAA requirements at all. As a result, for most of these sources, although they would need to apply for and receive a permit, there would be no applicable requirements to include in the permit and thus the exercise would not improve compliance.

The picture that emerges from a literal application of title V's requirements to all GHG sources—at the 100 tpy level, beginning on January 2, 2011—shows multi-year delays in issuance of all permits, for both the sources that have applicable requirements and that Congress clearly intended the program to cover, and for the millions of sources that may not be subject to any applicable requirements. In short, this literal interpretation would apply title V to millions of sources that Congress did not expect be covered, and the ensuing administrative burdens—at least initially—would impede the issuance of permits to the thousands or perhaps tens of thousands of sources that Congress did expect be covered. This is the type of “absurd results” from a literal application of statutory provisions that the courts have held should be avoided. And even beyond all that, the sheer magnitude of the numbers involved—millions of permits requiring thousands of FTEs at a cost to the permitting authorities of billions of dollars, all this beginning immediately at the time that GHGs become subject to regulation—makes clear that this result of a literal application of the title V provisions to GHG sources cannot be what Congress intended.

b. EPA's Reconciliation of Applicability Provisions With Congressional Intent

For the reasons just described, we should not consider the literal meaning

of the applicability provisions to be determinative of congressional intent as to the applicability of title V to all GHG sources; rather, we should examine other provisions of the statute and the legislative history to determine congressional intent on that question. If congressional intent is clear, we must adopt and implement an applicability approach that is as close as possible to congressional intent; and if congressional intent is not clear, then we must select an interpretation that is reasonable and consistent with the statutory requirements. This section explains EPA's view of congressional intent for the applicability of the title V program to GHG sources and the principles and approach EPA is using for tailoring. In addition, we also respond to other approaches that were suggested by commenters.

To determine congressional intent, we consider the statutory provisions and legislative history, and this analysis is similar to that for PSD. The most important title V provisions and legislative history for this purpose are the following:

(1) The applicability provisions themselves, which, as we have interpreted them, apply title V to all sources that emit at least 100 tpy of any air pollutant subject to regulation. CAA sections 502(a), 501(2)(B), 302(j). Although we do not believe these provisions should be applied literally to GHG sources, their broad phrasing indicates, directionally, a congressional intent towards inclusiveness of sources in title V, including GHG sources.

(2) The provisions for general permits, CAA section 504(d); and title V fees, CAA section 502(b)(3)(A). These provisions give title V an important measure of flexibility as to its scope. The explicit authorization of general permits means that title V may be applied to more sources and more efficiently, thereby saving costs to both source and permitting authority. The requirements for permit fees provide a mechanism for permitting authorities to, over time, develop their programs to cover more sources. In this sense, these provisions could be construed to indicate congressional intent to apply title V inclusively, to the extent that permitting authorities can accommodate additional sources through general permits and permit fees.

(3) The detailed procedural requirements—including time periods, such as the 18-month time period for action on permit applications—for title V permit processing. CAA sections 503, 505. Although these requirements are consistent with applying title V to GHG sources—in the sense that at least in

theory, there is nothing intrinsic to GHG sources that would mean that permitting authorities could not comply with these requirements—these requirements cast doubt on whether Congress can be said to have intended that title V cover the many small GHG sources (at least immediately) in light of the risk that including all those sources in title V would strain the process.

(4) The provisions and legislative history concerning applicable requirements, which indicate that a purpose of title V is to include sources' applicable requirements in their permits. CAA sections 503(b)(2), 504(a). These provisions, and the accompanying legislative history, discussed previously, suggest an intent to include within title V GHG sources that have applicable requirements, but may also suggest that Congress would not have intended to include in title V the large numbers of GHG sources that have "empty permits," at least where their inclusion would undermine implementation of the program for sources with applicable requirements.

(5) The small-business-assistance provisions of section 507 and the legislative history of title V—both the permitting program and the small-business-assistance program—concerning the scope of the permitting program and small businesses. These indicate that Congress intended title V to cover some tens of thousands of sources, and did not intend that title V apply to small businesses. These provisions and legislative history suggest that Congress did not intend for title V to apply to include large numbers of small GHG sources.

Finally, the legislative history of title V does not explicitly mention GHG sources, which could suggest that Congress did not have occasion to focus on whether and how title V would apply to GHG sources.

With all this, we believe that Congress had a clear intent on the question of whether title V generally applies to GHG sources, and that was that it does. As with PSD, the most important indication of congressional intent in this regard is the applicability provisions, which provide, in part, that title V applies to "any stationary facility or source of air pollutants which directly emits, or has the potential to emit, [the requisite quantity] of any air pollutant." CAA sections 502(a), 501(2)(B), 302(j). This term is quite broad, and should be read to include GHG sources. See *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007) ("Because greenhouse gases fit well within the Clean Air Act's capacious definition of 'air pollutant,'

we hold that EPA has the statutory authority to regulate the emission of such gases from new motor vehicles."'). Moreover, including GHG sources—under certain circumstances—is consistent with the various statutory provisions and statements in the legislative history described previously.

In the alternative, if it is concluded that Congress did not express a clear intent on that question, then, under *Chevron* Step 2, EPA exercises its discretion to conclude that title V applies to GHG sources as a general matter. This is a reasonable policy because applying the title V program to at least the larger GHG sources will assure promote accountability and enforceability for those sources, which is a key goal of the title V program, and will not impose obligations that are beyond the resources of those sources or insurmountable burdens on the permitting authorities. This policy is a reasonable interpretation of the statutory provisions for the same reasons just discussed.

As to the question of how title V applies to GHG sources, we believe that Congress cannot be said to have expressed a clear intent. A central aspect of how title V is to apply to GHG sources concerns "empty permits," and on this aspect, some of the above-described provisions and statements in the legislative history point in different directions. This is particularly true of, on the one hand the title V applicability provisions, which apply by their terms inclusively and, on the other hand, the requirement that sources include applicable CAA requirements in their permits, and the statements in the legislative history indicating that Congress intended title V to cover sources subject to other CAA requirements.

Because Congress cannot be said to have expressed an intent as to the manner and scope of title V applicability to GHG sources, then, under *Chevron* Step 2, EPA may apply a reasonable interpretation of the applicability provision to determine the scope of coverage of GHG sources that is consistent with the statutory requirements. The Tailoring Rule qualifies as such an interpretation. The Tailoring Rule in effect reads the applicability provisions not to apply title V to GHG sources at or above the 100 tpy level, but instead to apply title V to as many of the GHG sources at or above that level as possible and as quickly as possible, starting with the largest sources first, that is consistent with both the permitting authorities' ability to administer the program and with a sensible imposition of costs to

sources. This tailoring approach is consistent with the inclusive direction of the applicability provision, the flexibility in title V's scope that is inherent in the provisions authorizing general permits and requiring permit fees, the detailed process requirements, and the legislative history that focuses on Congress's concern about costs to sources and administrability. With the tailoring approach, over time, more sources may be included in title V, consistent with those provisions and legislative history. This reconciles the inclusiveness of the applicability provisions with Congress's expectations of a more limited scope for the title V program.⁴⁷ However, as part of the tailoring approach, we recognize that we may at some point determine that it is appropriate to exclude certain sources, such as the smallest of the GHG sources. In addition, we intend to address the issue of sources with "empty permits" in a later rulemaking, as discussed previously.

The specific phase-in schedule will depend on the following: We will gather information about the permitting authorities' ability to process permits, and we will develop streamlining techniques. Based on that information, we will address expanding the title V program in a step-by-step fashion to include more sources over time. Each step will be based on our assessment of the permitting authorities' and sources' ability to comply with their respective obligations under the title V program.

We recognize that the availability of permit fees to support title V permit actions creates a potentially important source of resources, and that this has implications for the permitting authorities' ability to implement the title V program for sources of GHGs. At least in theory, permitting authorities could assess and collect sufficient fees to support hiring and training sufficient personnel so that they could expand their programs to match the expansion in the number of sources covered by the program.

Even so, title V fees cannot be considered a panacea that will resolve all resource problems that permitting authorities will have, for several reasons. Permitting authorities will likely be constrained as to the rate in which they can increase fees in light of

⁴⁷ As with PSD, this way of reconciling the PSD applicability provisions with Congress's expectations for a narrower PSD program is consistent with the U.S. Supreme Court's view that the CAA should be read to include "regulatory flexibility, [without which] changing circumstances and scientific developments would soon render the Clean Air Act obsolete." *Massachusetts v. EPA*, 549 U.S. 532.

the costs to sources. As indicated elsewhere, at least at the outset of the program before streamlining techniques have been developed, a literal application of the title V applicability provisions to GHG sources would, on average, cost each industrial source \$46,400 and each commercial or residential source \$23,200 to complete the permit application and take other associated actions; and it would cost each permitting authority, on average, \$19,688 to process the industrial source permit and \$9,844 to process the commercial or residential source permit. Particularly in light of the high costs to sources of applying for a permit, it is not likely that permitting authorities would be able to pass on to the sources in the form of fees, the entirety of the permitting authorities' own high costs for processing those permits, at least not right away. Even to the extent it would be possible to raise permit fees, permitting authorities would have to undergo a process to assess, impose, and collect those fees, and then hire and train personnel. The survey from the state and local agencies described previously forecast a 2-year period for hiring and training, without counting time for the fee process. For these reasons, we do not believe that the authorization for fees will allow the permitting authorities either to accelerate Steps 1 or 2 of the tailoring schedule or to permit a larger number of sources at those steps. Step 1 will take effect on January 2, 2011, Step 2 will take effect on July 1, 2011, and the process for determining and collecting fees, and then hiring and training personnel will take at least several years after July 1, 2011.

Moreover, we do not believe that the authorization for fees means that the permitting authorities can reasonably be expected to permit title V sources at levels below 50,000 tpy CO₂e before 2016. The next level below 50,000 tpy CO₂e for which we have data is 25,000 tpy CO₂e, and the costs to permitting authorities to run their programs at that level (\$126 million) is more than double their current costs (\$62 million). We do not consider it reasonable to expect permitting authorities to more than double their program within the first 6 years of title V applicability to GHG sources. That it is not reasonable to expect that is made even clearer when the permitting authorities' burdens in implementing their PSD programs are considered. The ability of permitting authorities to impose fees may have more important implications for subsequent steps, and as we address those subsequent steps in future

rulemakings, we will consider the fees. EPA's approach to fees in this rulemaking is discussed elsewhere.

c. Other Possible Approaches to Reconciling Literal Reading of Title V Applicability Provisions and Congressional Intent

Having described how the *Chevron* framework, accounting for the "absurd results" doctrine, applies to title V requirements in this case and why it supports this Tailoring Rule—under which we expect to apply title V to more sources, in a step-by-step fashion, over time—we turn to the last part of our discussion of this doctrine. Here, we address another possible approach suggested by comments, which is that EPA should apply the title V program only to sources that are subject to applicable requirements, so that sources should not be required to hold "empty permits" (e.g., permits issued to a source that is not subject to any applicable requirement for any pollutant). To the extent that commenters argue that the statute requires EPA to adopt a "no-empty-permits" theory, we disagree. We believe that although various provisions of title V indicate that one of title V's purposes is to gather a source's applicable requirements into a single permitting mechanism, *see* CAA sections 503(b)(1), 504(a), we do not read those provisions as expressly limiting, as a matter of *Chevron* Step 1, title V to sources with applicable requirements. The applicability provisions, by their terms, include sources based on amount of emissions, and do not include any explicit limits to applicability based on whether the sources has applicable requirements. As described previously, we believe that Congress, although clearly expressing an intent that title V apply to GHG sources generally, did not express a clear intent as to how title V applies to GHG sources. The tension between these two sets of provisions, which we identified in the proposal and commenters further discussed, provides further support for that conclusion. Accordingly, we have discretion under *Chevron* Step 2 to determine a reasonable approach, consistent with the statutory requirements, concerning the application of title V to GHG sources with empty permits.

We note that to date, we have issued permits to sources without applicable requirements, albeit on rare occasions. We have little reason to believe that the "empty-permits" issue will arise in Steps 1 and 2 of our tailoring approach because we believe there will be no "empty permits" in Step 1 or Step 2 or, if there are, that they will be very few

in number. As stated elsewhere, we believe that the tailoring approach we adopt in this rulemaking for Steps 1 and 2 is a reasonable approach that is consistent with statutory requirements.

We need to gather more information concerning the potential number and utility of "empty permits" for GHG sources, in light of the fact that the need for requirements in title V permits will vary based on the requirements of each SIP, and the fact that some SIPs contain broadly applicable requirements. As stated elsewhere, we intend to consider the issue of the applicability of title V to GHG sources with "empty permits" in Step 3 of our tailoring approach. When we do so, we will further assess the potential for the approach of excluding empty permits from title V to relieve burden consistent with statutory requirements.

7. Additional Rulemaking for the PSD and Title V Programs

The previous sections 5 and 6 discussed our application of the *Chevron* framework, accounting for the "absurd results" doctrine, to the PSD and title V applicability requirements, respectively. As another point in this regard, which is relevant for both PSD and title V purposes, we also commit to subsequent rulemakings in which we may further address the "absurd results" doctrine.

Specifically, we will propose or solicit comment on establishing a further phase-in, that is, a Step 3, that would apply PSD and title V to additional sources, effective July 1, 2013, and on which we commit to take final action, as supported by the record, by no later than July 1, 2012. We further commit to completing another round of rulemaking addressing smaller sources by April 30, 2016. Our action in that rulemaking would take into account the severity of the remaining problems associated with permitting authority burden and source costs.

While committing to future action, we do not decide in this rule when the phase-in process will ultimately end, or at what threshold level, because all that depends on uncertain variables such as our progress in developing streamlining approaches and on permitting authorities' progress in developing permitting expertise and acquiring more resources. We may continue the phase-in process with further rulemaking(s) after 2016. Alternatively, we may make a final determination through future rulemaking that, under the "absurd results" doctrine, PSD and/or title V do not apply to GHG sources that, while small and relatively inconsequential in terms of GHG contribution, are above

the statutory tonnage thresholds for these programs, and thereby end the phase-in process. In addition, we may consider whether to limit title V applicability to GHG sources in order to minimize the number of GHG sources with “empty” permits.

8. Rationale for the Phase-In Schedule for Applying PSD and Title V to GHG Sources

Having discussed in sections V.B.5, V.B.6, and V.B.7 the reasons for tailoring the PSD and title V programs, we now describe our rationale for selecting the specific phase-in schedule in this rule for applying PSD and title V to GHG-emitting sources. To reiterate for convenience, under Step 1 of this schedule, which begins on January 2, 2011, (1) PSD applies to the GHG emissions of “anyway” PSD sources, that is, sources that are subject to PSD anyway due to their emissions of conventional pollutants and that undertake a modification that results in an increase of at least 75,000 tpy CO₂e; and (2) title V applies to “anyway” title V sources, that is, sources that are subject to title V anyway due to their emissions of conventional pollutants. Under Step 2, which begins on July 1, 2011, (1) sources will be subject to PSD on account of their GHG emissions if they newly construct and emit at least 100,000 tpy CO₂e, or if they are existing sources that emit at least 100,000 tpy CO₂e of GHGs and make a modification that results in the emission of at least 75,000 tpy CO₂e; and (2) existing and new sources will be subject to title V on account of their GHG emissions if they emit 100,000 tpy CO₂e in GHG emissions. In addition, EPA intends to begin another round of rulemaking—Step 3—in 2011 and commits to complete it by July 1, 2012. In that rulemaking, we will propose or solicit comment on a further phase-in of GHG sources for PSD and title V applicability, and we may propose or solicit comment on another application of the “absurd results” doctrine that excludes categories of sources from PSD or title V. However, under this rule, in no event will EPA apply PSD or title V to sources below the 50,000 tpy CO₂e levels in Step 3, or any other step we might promulgate prior to April 2016. In addition, EPA commits to conduct a study, to be concluded by April 30, 2015, evaluating the status of PSD and title V applicability to GHG sources, and, based on the study, complete a rulemaking by April 30, 2016 that addresses another round of a phase-in.

a. Rationale for Step 1

In Step 1 of our tailoring approach, which begins on January 2, 2011, PSD and title V requirements will apply to only those sources that are subject to PSD or title V requirements anyway due to their conventional pollutants (“anyway” sources) and that, in the case of PSD, make modifications that result in an increase in GHG emissions of at least 75,000 tpy CO₂e. No sources would become major for PSD or title V under this step based on their GHG emissions alone. This section describes our proposal, comments on the proposal and our response to those comments, and our rationale for Step 1.

(1) Proposal

In our proposal, we proposed (1) the application of PSD and title V requirements to sources that emit at least 25,000 tpy CO₂e, (2) a PSD significance level of between 10,000 and 25,000 tpy CO₂e, and (3) a commitment to undertake a study to be followed by further rulemaking after 6 years. In addition, we solicited comment on the alternative of limiting PSD and title V applicability to “anyway” sources for at least the first 6 years. Under this approach, PSD and title V applicability would be determined based on non-GHG pollutants, and without regard to GHGs, but those sources subject to PSD would also be subject to BACT requirements for GHGs if their GHG emissions exceeded the significance level established in the final rule, and those sources subject to title V would be required to include any applicable requirements for GHGs in their permits.

(2) Comments

Many commenters supported this “anyway”-source approach, and offered a variety of reasons: According to the commenters, (1) This approach is a better reading of Congress’s intent in the Act and is consistent with *Alabama Power v. Costle*, 636 F.2d 323 (DC Cir. 1980); (2) this approach would reduce the permitting workload on sources currently considered minor and focus PSD and title V requirements on large sources of non-GHG pollutants, as intended by Congress; (3) it is appropriate to base PSD and title V applicability on non-GHG emissions until data on GHG emissions are available from the mandatory GHG reporting rule; (4) in the initial phase, this approach would be more straightforward to administer, would provide a more predictable permitting workload, and would prevent a flood of newly regulated sources from overburdening state agencies; (5) this

approach would provide permitting agencies time to develop experience handling GHG sources and requirements under the PSD and title V programs; (6) this approach would provide EPA and the permitting agencies the time needed to develop streamlining techniques; (7) this approach is consistent with the “absurd results” and “administrative necessity” doctrines because the scope of the permitting programs would remain consistent with both congressional intent and current administrative practice, but EPA and state agencies would still be allowed to begin regulating GHG emissions from existing PSD and title V sources; and (8) sources already required to obtain PSD permits are best equipped to work through BACT issues with permitting authorities.

Commenters added that if BACT is applied for GHGs due to permit actions involving non-GHG pollutants, EPA would need to set a significance threshold for the application of BACT, without which BACT could apply to very small (*e.g.*, 1 ton) GHG increases associated with projects that otherwise triggered PSD for increases of non-GHG.

(3) Determination as to Step 1, PSD and Title V Applicability and PSD Significance Level

After considering the administrative burdens from increased permitting actions and the need for permitting authorities to have sufficient time to develop necessary expertise and staffing resources to address that burden, we have decided in this final action to establish the “anyway” source approach as Step 1. Beginning on January 2, 2011, sources subject to PSD requirements for their conventional pollutants anyway will be required to apply BACT to their GHG emissions if they construct or modify and in so doing, emit at least 75,000 tpy CO₂e in GHGs. Similarly, sources subject to title V requirements anyway due to their conventional pollutants will be required to meet certain requirements for their GHGs, as described elsewhere. These requirements at Step 1 for PSD and title V will not expire. On July 1, 2011, a further phase-in of PSD and title V applicability—Step 2—will kick in.

At Step 1, by definition, all of the covered sources are already subject to PSD and title V permitting requirements, and will simply be adding a GHG component to what would be an otherwise occurring permitting action for conventional pollutants. These sources include fossil fuel-fired power plants, petroleum refineries, cement plants, iron and steel plants, pulp and paper plants, petroleum refineries, large

landfills, and other large industrial sources. These sources will need to perform some additional analysis that is unique to GHG emission units, particularly related to the BACT review and selection process, but they will likely be able to utilize information developed as part of other permitting requirements for conventional pollutants, such as equipment fuel usage and operational parameters. Also, because these facilities are familiar with the case-by-case permitting processes, including all the steps from the application to the final review process, they will not confront a high PSD or title V learning curve.

The “anyway” source approach has particular appeal during the first step of the phase-in approach because it begins to apply key PSD and title V program requirements as soon as January 2, 2011 to large sources of emissions, but because it applies only to sources that are already subject to PSD for other pollutants, it can be implemented efficiently and with an administrative burden that is manageable in the next 8 months. We expect that under this approach, the sources and permitting authorities will still face substantial additional work to address the GHG emissions. In addition to the activities discussed elsewhere, there will be significant and complex policy questions about how BACT will be implemented for GHGs that must be resolved. These issues will include how to determine BACT for GHGs, how to do netting, and other similar issues. Even with EPA guidance, many case-specific policy issues will arise and will have to be resolved by the permitting authority in the context of a specific permit application. Nevertheless, with the “anyway” source approach, this work will be manageable because the associated permitting burden will be limited to adding a GHG component to each existing permit action for which it will be required, and will avoid the significantly greater burdens associated with large numbers of new permit actions that would be required for sources and modifications that would be subject to PSD for the first time. Instead, this “anyway” source approach allows permitting authorities sufficient time to develop necessary expertise and staffing resources to address GHG BACT.

We agree with commenters that the establishment of a significance level—which, in effect, is a BACT threshold—is appropriate, and we have decided to establish this level at 75,000 tpy CO₂e because, for reasons discussed later, that is the level that will apply during Step 2. At this level, the administrative burdens, described later, will be

manageable. Importantly, we believe a consistent significance level between Steps 1 and 2, as opposed to a lower significance level in Step 1, will provide for a smoother transition and avoid the problems that would arise if PSD applied to modifications during Step 1 that PSD would not apply to in Step 2. Otherwise, we would create a perverse incentive for companies to delay such projects until Step 2 to avoid BACT.

We estimate that Step 1 will result in a 23 percent increase in permitting authority work hours and a \$3 million increase—which amounts to a 25 percent increase from the current program cost of \$12 million—in their annual costs for running PSD programs. This is primarily due to the GHG BACT review requirements. For title V programs, we estimate a 2 percent increase in permitting authority work hours and a \$1 million increase in the title V annual program costs for permitting authorities under Step 1 as compared to the current program cost of \$62 million. These work hours and costs will be needed primarily to review GHG emissions information, add any GHG-related requirements to title V revisions and renewal actions that would otherwise be occurring, respond to comments and petitions from the public, as well as develop fee requirements and make fee determinations associated with issuing new or revised title V permits that add GHG-related information. For both the PSD and title V programs on a combined basis, the additional costs for Step 1 will be \$4 million, which amounts to a 5 percent increase in the current combined program cost of \$74 million.

In addition to these workload and monetary costs, permitting authorities will confront additional burdens before and during Step 1, which we have not attempted to quantify. One of the most significant of these is training staff in the PSD-related areas of GHG emissions calculations and BACT evaluations. In addition, permitting staff will need to build staff expertise and capacity for addressing GHG requirements in preparation for Step 2, which will begin only 6 months after Step 1; and in communicating and providing outreach to sources addressing GHG emissions for the first time. Based on comments we received on the proposal from permitting authorities, we believe these additional training and outreach requirements—for both the PSD and title V programs—will add significantly to the permitting authorities’ burden during the initial 6-month period under Step 1.

We believe that these administrative burdens are substantial but manageable.

Following this action, permitting authorities will have only 8 months to prepare for Step 1, when they will need to increase their resources by 5 percent for both the PSD and title V programs combined, and be able to implement BACT requirements for GHG sources. During Step 1, they will need to prepare for Step 2, when, as discussed later, they will need to process over 900 additional PSD permits each year and begin to process over 1,100 additional title V permit actions.

We have decided to limit Step 1 to the “anyway” source approach, and not apply PSD or title V to sources based on their GHG emissions, for several reasons. First, we believe that the administrative burdens described previously are the most that the permitting authorities can reasonably be expected to manage before and during Step 1. Tighter PSD and title V applicability requirements would mean greater administrative burdens.

Second, we believe that the costs of GHG permitting to the sources, as described previously, are substantial and as a result, necessitate that we wait for the permitting authorities to develop the PSD and title V programs for GHG sources during the first 6 months of 2011 before subjecting sources to PSD and title V requirements on account of their GHG emissions. By July 1, 2011, when Step 2 takes effect, the PSD and title V programs will be better developed. For example, the permitting authorities will have more experience making BACT determinations. In addition, by that time, sources will have had more time to prepare for the permitting processes. In addition, as suggested by one commenter, the additional time will allow sources and permitting authorities to address the current uncertainty surrounding how to measure high-GWP gases.

Third, we estimate that “anyway” sources account for approximately 65 percent of total national stationary source GHG emissions. As a result, limiting Step 1 to these sources will still capture a large portion of the GHG inventory.

A large number of commenters urged us to leave this “anyway” source approach in place until such time as we complete an assessment and conduct further rulemaking, which we proposed would be 6 years from now. We are not taking this action; rather, for the reasons discussed next, we believe it is reasonable to use GHG thresholds to begin to phase in PSD and title V applicability to additional sources in Step 2.

b. Rationale for Step 2

(1) Proposal

We proposed to establish the applicability level for PSD and title V to GHG sources at 25,000 tpy CO₂e, and we proposed a PSD significance level in the range of 10,000 to 25,000 tpy CO₂e. Our burden estimates at proposal led us to conclude that at those threshold levels, for the PSD program, “approximately 400 additional new or modified facilities would be subject to PSD review in a given year. These include approximately 130 new facilities and approximately 270 modifications * * *.” 74 FR 55331, col. 1. We estimated that processing these numbers of additional permits, along with doing the additional work associated with GHG emissions from sources subject to PSD anyway due to their conventional emissions, would increase permitting authority burdens by “approximately 112,000 staff hours at an additional cost of approximately \$8 million. This workload amount represents an increase of about 1.3 times, or 32 percent, in the current burden for permitting authorities on a nationwide basis.” *Id.* col. 3. We concluded that “this additional burden is manageable,” but that “any threshold lower than 25,000 tpy CO₂e, would create undue administrative burdens.” *Id.*

For the title V program, we estimated that at a 25,000-tpy CO₂e permitting threshold, “about 13,600 existing facilities” would become subject to title V, and that to manage the additional workload associated with permitting those sources and with the other permit revisions and modifications that would result from the 25,000 tpy CO₂e threshold, permitting authorities would require an additional 492 FTEs, which would be an estimated 50 percent increase over current title V staffing levels. 74 FR 55335, cols. 1–2.

(2) Comments

We received a significant number of comments from both permitting authorities and industry representatives that our proposed GHG threshold of 25,000 tpy CO₂e for major source applicability was too low and would result in an unmanageable amount of permitting actions in the near term. Many offered evidence that we severely underestimated both the number of permitting actions and the per-permit administrative burden, for both PSD and title V programs.

Commenters also asserted that the proposed 25,000 tpy threshold is too low because it will subject small sources (including many small businesses) to PSD and title V, which is not in keeping

with Congress’s intent to limit PSD and title V to large sources when Congress set the 100/250 tpy thresholds for the permitting programs. EPA, in collaboration with the SBA, conducted an outreach meeting designed to exchange information with small entities that may be interested in these regulations. The EPA took this small business outreach effort into account when finalizing this rule. Many commenters from this outreach effort said that there were many more small businesses that would become subject to PSD and title V due to the proposed permitting thresholds than EPA estimated at proposal.

Many commenters recommended specific major source thresholds for PSD and title V, including levels of 25,000 (as proposed), 40,000, 50,000, 100,000, 150,000, 250,000, and 1,000,000 tpy CO₂e. A majority of the commenters—including both industry and state agency commenters—recommended major source thresholds of 100,000 tpy CO₂e. However, several state agency commenters recommended thresholds of 50,000 tpy CO₂e. Other commenters recommended sector-specific thresholds. For example, solid waste industry commenters suggested thresholds of 820,000 tpy CO₂e for PSD [which they calculate to be equivalent to the existing PSD threshold for “municipal solid waste landfill emissions,” *i.e.*, 250 tpy nonmethane organic compounds (NMOC)] and 320,000 tpy CO₂e for title V (calculated to be equivalent to the existing major source applicability threshold of 100 tpy NMOC). Other commenters urged EPA to set the GHG thresholds at levels that correspond to emissions of conventional pollutants at the 100/250 tpy level.

Many of the commenters that recommended increasing the thresholds cited EPA’s estimates that a particular threshold would significantly reduce the number of sources subject to the rule while causing only a slight reduction in the percentage of GHGs captured. Several of these commenters noted that Table VIII–2 in the proposal preamble indicates that shifting the major source threshold for PSD from 25,000 to 100,000 tpy CO₂e would reduce the number of major sources from 13,661 to 4,850 while reducing the coverage of U.S. stationary source GHG emissions by only about 4 percent. Other commenters referred to the regulatory impact analysis (RIA) for the mandatory GHG reporting rule to conclude that raising the threshold from 25,000 to 100,000 tpy CO₂e would exclude thousands of entities that, on a combined basis, emit only one percent of the nation’s GHG emissions. See the

RTC document for this final rulemaking for more detailed description of comments received on our proposed burden assessment.

Many commenters also recommended specific PSD GHG significance thresholds, including levels of 10,000 (as proposed), 15,000 (within the proposed range), 25,000 (also as proposed), 40,000, 50,000, and 100,000, and 150,000 tpy CO₂e, as well as suggesting sector-specific thresholds. These recommendations were based on the view that we had underestimated the number of modifications and that the burden of permitting at the proposed levels would therefore be much worse than we projected. A number of the commenters argued that the significance threshold should be no less than the major source threshold, at whatever level that is set. The largest number of commenters recommended a PSD significance threshold of 100,000 tpy CO₂e, although significant numbers also support 25,000 and 50,000 tpy CO₂e.

(3) Rationale for Step 2

Based on these comments, we reassessed our original burden estimates from our proposal. This reassessment is discussed at the beginning of this section. We decided that, once this adjustment is taken into account, the burdens at the proposed 25,000 threshold and the proposed 10,000–25,000 significance levels would be unmanageable. We therefore evaluated higher thresholds ranging from a 25,000 tpy CO₂e major source applicability level for PSD and title V to a 50,000, 75,000, or 100,000 tpy CO₂e level, with associated PSD GHG significance levels of equal or lesser magnitude; and we selected the 100,000/75,000 tpy CO₂e level. Central to our decision to promulgate higher thresholds than what we proposed is our recognition, based on comments and further analysis, that applying PSD to GHG sources at the statutory or any other threshold level or significance level that we have considered would result in (1) a greater number of sources, and significantly greater number of modifications than we first estimated becoming subject to those programs; and (2) a greater per-permit cost than we first estimated to the permitting authority of processing those permit actions. We discussed our revised estimates and reasoning at the beginning of this section.

We now estimate that the 25,000/25,000 tpy level would result in 250 additional PSD permit actions for new construction (either for GHG-only sources or additions to otherwise occurring permits) and an additional 9,200 PSD permits for modifications

each year (compared to our estimate at proposal of 130 for new construction and 270 for modifications). This level of permitting would require an additional 2,815,927 work hours, or 1,400 FTEs (compared to our estimate at proposal of 112,000 additional work hours, or 57 FTEs); and would cost an additional \$217 million each year (compared to our estimate at proposal of an additional \$8 million). See 74 FR 55331 (proposal). This \$217 million amount represents approximately a 1,800 percent increase over current permitting authority annual cost of \$12 million for the major NSR programs.

For title V, under our final burden analysis at a 25,000 tpy CO₂e threshold, we estimate a \$64 million annual increase in program costs to permitting authorities to add GHG emission sources, which reflects a greater than 100 percent increase over current program costs of \$62 million. We estimate that this increased burden would result in the need for almost 700 new FTEs nationwide at permitting authorities (compared to our estimate at proposal of 492 additional FTEs, or about a 50 percent increase in existing program size). This increase in burden is due to an estimated annual increase of 2,500 new title V permits, over 9,500 permit revisions, and over 2,600 permit renewal actions due to GHG emission sources. These additional title V actions compare to current annual program actions of approximately 50 new title V permits, 1,394 significant revisions, and 3,267 permit renewals.

Based on this information, we have decided not to finalize our proposal to apply a 25,000 tpy CO₂e applicability threshold to GHG sources at the time that PSD and title V take effect. At that level, too many sources—many more than we thought at proposal—would be subject to high permitting costs. In addition, permitting at that level and at that time would not be administratively feasible. The resulting increase in the number of PSD and title V permitting actions and workload would create insurmountable resource demands for permitting agencies in the near term, which would jeopardize the functioning of these permitting programs. We are mindful that not only would the permitting programs have to bear the costs that our estimates are able to monetize, but they would also incur burdens associated with hiring and training staff to make and implement GHG BACT determinations, GHG emissions evaluations, and other evaluations required under the PSD program for a wide variety of formerly unpermitted sources, including significant numbers and types of small

manufacturing and commercial or residential establishments. They would also incur burdens associated with reviewing applications, citizen comment and petitions, and the need to communicate and provide outreach to new categories of sources, including, again, significant numbers and types of small manufacturing and commercial or residential sources. Thus, the increased administrative burdens at the 25,000/25,000 tpy CO₂e levels are so great that we have concluded that they would not be consistent with the goals of avoiding absurd results that contravene congressional intent, including avoiding a permitting burden that would overwhelm the capacity of permitting authorities to effectively implement their programs.

Based on our revised burden analysis, in this final action, we have decided to establish a multi-step, phase-in approach that contains a significantly higher initial threshold level. We have determined that a 100,000 tpy CO₂e major source threshold level for PSD and title V purposes, and a 75,000 tpy CO₂e significance level, produce a level of permitting activity that would certainly be an increase over current workload, but that would be administratively feasible by July 1, 2011. As a result, we have decided to finalize these thresholds as Step 2.

In reaching this conclusion, we needed to consider both the sources' abilities to manage the permitting process and the permitting authorities' capacity to address newly-major sources as expeditiously as possible. As to the former, sources subject to Step 2 will, for the most part, continue to include the "anyway" sources subject to Step 1. In addition, we estimate that Step 2 will include about 500 additional sources that are not already subject to permitting. Most of them will become subject to PSD and title V because of fuel burning. In order to meet the 100,000/75,000 threshold, they will have to burn a significant quantity of fuel, and that means they will be a significant size. In general, these sources include municipal or commercial landfills that are large, but not large enough to be covered by the NSPS, pulp and paper facilities, electronics manufacturing plants, chemical production plants, and beverage producers. Although these sources have not been subject to PSD permitting before, some of them have already been subject to minor source permitting, and so will have some familiarity with the permitting process. In addition, in general, these sources are in source categories that have larger sources that are already subject to PSD and title V.

As a result, they are in industries that have experience in the permitting process. Because of their relatively large size and access to knowledge about the permitting processes, we believe these sources will be able to manage the permitting requirements.

As to the permitting authorities' capacity to handle the Step 2 workload, we note first that our Step 1 approach does not cover newly-major sources. As a result, the Step 2 threshold and timing has to be established in a way that takes into account permitting authority challenges in addressing many sources and categories that would be subject to major source permitting for the first time.

We considered the various PSD and title V threshold applicability and significance level options in our final burden analysis, summarized in Table VI-1, including levels at 50,000 CO₂e and 100,000 CO₂e. As Table VI-1 indicates, we estimate that a 100,000 tpy CO₂e major source applicability threshold would result in approximately 550 sources becoming newly classified as major sources for PSD based on their GHG emissions, while a 50,000 tpy CO₂e threshold would result in 3,500 newly classified major sources.

We then considered the impact on both PSD and title V programs of different PSD significance level options for GHGs. The choice of a PSD significance level has a direct impact on title V burdens because PSD permit requirements resulting from modification activities will result in required title V permit revisions. We developed PSD and title V burden estimates based on significance levels of 50,000 tpy, 75,000 tpy and 100,000 tpy CO₂e, combined with a major source applicability level of 100,000 tpy CO₂e.

At a 50,000 tpy CO₂e significance level, we estimated an annual increase of approximately 1,800 PSD permitting actions and almost 2,000 additional title V permitting actions, as compared to Step 1. At a 75,000 tpy CO₂e significance level, we estimated an annual increase of approximately 900 PSD permitting actions and just over 1,000 additional title V permitting actions as compared to Step 1. At a 100,000 tpy CO₂e significance level we estimated an annual increase of approximately 25 PSD permitting actions and 210 additional title V permitting actions as compared to Step 1. For title V, under these different scenarios, the major source applicability level of 100,000 tpy CO₂e results in approximately 200 new permits annually, but, as noted, the choice of significance levels affects the number of required permit revisions.

Based on this information, we have decided to set our final Step 2 thresholds at 100,000 tpy CO₂e for major source applicability under PSD and title V and at a 75,000 tpy CO₂e significance level for PSD. Overall, we estimate that the almost 900 additional PSD permitting actions (virtually all of which would be modifications) per year at these levels will result in an approximately \$21 million increase (from Step 1) in states' annual costs for running PSD programs. In addition, we estimate that the 1,000 additional title V permit actions will cause the total title V burden for permitting authorities to increase by \$6 million annually from Step 1. This total increase in permit program burdens of \$27 million represents a 34 percent increase over the \$78 million in total cost of PSD and title V programs at Step 1. We consider this a substantial increase particularly because Step 2's start date of July 1, 2011, is only 6 months after Step 1's start date of January 2, 2011. What's more, Step 1 will entail a substantial increase in permitting authority obligations, so that adding the costs of Step 1 and Step 2 together—\$31 million—means that permitting authorities will be required to increase their permitting resources by approximately 42 percent between now and Step 2. In addition to the administrative burdens we have been able to monetize, we must be mindful that permitting authorities will incur other burdens, including the significant support and outreach activities by permitting staff for the many newly permitted sources. We believe that any lower thresholds in this timeframe, whether in the PSD and title V applicability levels or in the significance level, would give rise to administrative burdens that are not manageable by the permitting authorities.

Although the burdens at the 100,000 tpy CO₂e/75,000 tpy CO₂e levels are steep, we consider them manageable. Step 2 permitting for GHGs will mostly involve source categories in which some sources have traditionally been subject to permitting, which should render applying even the new GHG requirements more manageable. These source categories include fossil fuel-fired power plants, petroleum refineries, cement plants, iron and steel plants, and petroleum refineries, in addition to other large industrial type source categories. A full description of the type of sources that we expect will have GHG emissions that exceed the 100,000 tpy CO₂e threshold is provided in the "Technical Support Document for

Greenhouse Gas Emissions Thresholds Evaluation" located in the public docket for this rulemaking. In addition, because Step 2 does not begin until July 1, 2011, permitting authorities have about 14 months to prepare for it.

In addition, we believe that the sources that will become subject to PSD and title V requirements at the 100,000/75,000 tpy CO₂e levels will be able to accommodate the additional costs of permitting. For the most part, these sources will be of a comparable size and activity level as those sources that are already subject to those requirements.

Because the administrative burdens at the 100,000/75,000 tpy CO₂e level are as heavy as the permitting authorities can reasonably be expected to carry, adopting these threshold levels is consistent with our legal basis under the "absurd results" doctrine. Under this basis, we are reconciling the statutory levels with congressional intent by requiring that the PSD and title V requirements be applied to GHG sources at levels as close as possible to the statutory thresholds, and as quickly as possible, in light of costs to sources and administrative burdens.

Because the administrative burdens at the 100,000/75,000 tpy CO₂e level are manageable, we do not believe that higher threshold levels are justifiable for Step 2. Specifically, at the 100,000/100,000 level—which would entail a 100,000 tpy CO₂e significance level, rather than a 75,000 tpy CO₂e level—permitting sources would need to handle only 20 additional modifications beyond current levels, and thus would not incur substantial additional costs. By the same token, we disagree with commenters who suggested that we needed to set permanent GHG permitting thresholds for major sources at a rate equivalent to the amount of GHGs that would be emitted by conventional pollutants at the 100 and 250 tpy level in order to meet the legal bases of the "absurd results" and "administrative necessity" doctrines. These levels would likely be well above 300,000 tpy CO₂e, depending on fuel types and assumptions regarding the relative emissions of GHGs compared to the conventional pollutants. Our data show that none of the levels above 100,000/75,000 tpy CO₂e would result in significant increases in administrative burdens. As a result, establishing these levels would not apply PSD or title V requirements to GHG sources as quickly as possible, and thus would not be consistent with our approach in the Tailoring Rule.

We estimate that facilities meeting the Step 2 major source applicability thresholds account for approximately 67

percent of total national stationary source GHG emissions. Many commenters felt that this should be an important basis for our selection of a threshold, stating that there is no significant loss in GHG emissions coverage of source categories at the 100,000 tpy CO₂e threshold, and in some cases arguing that as a result, we should set the level even higher. We agree that it is important that the coverage in Step 2 represents 86 percent of the coverage at full implementation of the statutory 100/250 thresholds.

c. Rationale for EPA's Plan Beyond Step 2

EPA commits that after Step 2, EPA will begin another rulemaking in 2011 and complete it by July 1, 2012, and in that rulemaking take comment on a further phase-in of GHG sources for PSD and title V applicability (Step 3). However, under this rule, in no event will EPA apply PSD or title V to sources below the 50,000 tpy CO₂e levels prior to 2016. In addition, EPA commits to conduct a study, to be concluded by April 30, 2015, evaluating the status of PSD and title V applicability to GHG sources, and, based on the study, complete a rulemaking by April 30, 2016, that addresses another round of a phase-in.

(1) Proposal

In our proposal, we noted that following implementation of the first phase of PSD and title V applicability to GHG sources, generally at the 25,000 tpy CO₂e threshold, additional action would be required over time to assure full compliance with the statute. We did not establish more steps in the schedule, but we did commit to conduct a study, to be completed by 5 years after promulgation, evaluating the status of PSD and title V applicability to GHG sources, and, based on the study, complete a rulemaking by 6 years after promulgation that addressed an additional step of the phase-in.

(2) Comments

A number of commenters supported the proposal's overall approach to phase in the permitting of GHGs, mainly because this approach will allow permitting of the largest sources of GHGs immediately while collecting more information about smaller sources and more fully considering streamlining options for subsequent phases. Many of these commenters made clear that they do not support implementation of the statutory 100/250 tpy thresholds, even through a phase-in approach. On the other hand, one commenter asserted that EPA has failed to demonstrate that

it needs 6 years to study and implement NSR and title V for sources emitting less than 25,000 tpy. The commenter contends that EPA has not analyzed, among other things, what combined effect the full implementation of its streamlining proposals in the 15 months before the due-date for title V permit applications would be to reduce the cost, complexity, and number of title V permit applications that would have to be submitted.

(3) Rationale for Further Steps

We agree with commenters who support a phased-in approach to the Tailoring Rule. Our final action reflects a multi-step process that we believe will facilitate a manageable expansion of PSD and title V applicability, as appropriate, to GHG-emitting sources. In our final action, we have established the initial two steps of a multi-step phase-in of lower threshold applicability with a commitment to take further regulatory activity to consider adopting lower thresholds. We believe this process will provide substantial opportunity for permitting authorities and sources to establish enough experience and information, and to provide significant real-world feedback to EPA, so as to better inform decisions on future phase-in steps.

With this overall phase-in approach in mind, in this final rule, EPA includes an enforceable commitment to undertake a notice-and-comment rulemaking that would begin with an SNPR that we expect to be issued in 2011 and that we commit will be finalized in 2012. The notice will propose or solicit comment on further reductions in the applicability levels. This rulemaking will take effect by July 1, 2013, and therefore, in effect, constitute Step 3. In this action, we are committing to a rulemaking for Step 3, but are not promulgating Step 3, because it is important to allow EPA and the permitting authorities to gain experience permitting sources under Steps 1 and 2, and to allow time to develop streamlining methods, before attempting to determine what would be the next phase-in levels for PSD and title V applicability. While committing to future action, we do not decide in this rule when the phase-in process will ultimately end, or at what threshold level, because all that depends on uncertain variables such as our progress in developing streamlining approaches and on permitting authorities' progress in developing permitting expertise and acquiring more resources. We may continue the phase-in process with further rulemaking(s) after 2016. Alternatively, we may make a final

determination through future rulemaking that, under a *Chevron* analysis, accounting for the "absurd results" doctrine, PSD and/or title V do not apply to GHG sources that, while small and relatively inconsequential in terms of GHG contribution, are above the statutory tonnage thresholds for these programs, and thereby end the phase-in process.

In addition, in this action, we are determining that in no event—whether through Step 3 or a subsequent step—will we apply PSD or title V to sources at the 50,000/50,000 tpy CO₂e level or lower prior to May 1, 2016. We have several reasons for making this determination at this time. Most importantly, our examination of the expected burdens to the permitting authorities of applying PSD and title V to GHG sources convinces us that extending the permitting programs to sources at or below the 50,000/50,000 tpy CO₂e level within 6 years of promulgation would result in prohibitively heavy burdens. This threshold option would result in close to 2,000 additional annual PSD permitting actions per year over the current program and more than 1,000 over Step 2, including both new construction and modifications. For title V, we estimated an increase of over 1,000 new title V permits (all newly permitted sources because of GHG emissions) over 2,000 permit revisions per year over the current program, and about 980 new title V permits and 900 permit revisions more than the Step 2 amounts.

These increases, which could occur between 2013 and 2016 under our approach depending on the outcome of the Step 3 rulemaking, represent very substantial additions to the permitting program. In terms of cost, we estimate that these additional actions would result in a \$73 million per year increase in joint PSD and title V program costs over the current programs—which is almost a doubling of costs—and \$42 million annual cost increase over Step 2 for the current programs. We believe that it would take permitting authorities some time to adjust to this workload. This is particularly true because at the 50,000/50,000 tpy CO₂e level, smaller sources—including ones not previously subject to permitting requirements—will become subject to PSD and title V. It will take some time for both the permitting authorities and the sources to absorb these new obligations.

Importantly, the next lower cut-off—below 50,000 tpy CO₂e for the major threshold level—is the 25,000/25,000 tpy CO₂e level. For the reasons discussed previously, this level is

clearly not manageable within the first 6 years after this action. This applicability level would bring in over 7,000 sources that would be newly subject to title V permitting and result in close to 10,000 new PSD permitting actions. This would result in a 380 percent increase over current program costs for PSD and title V to run these programs. Based on comments we received from state and local permitting agencies on our proposed Tailoring Rule, these levels of permitting activities would far exceed the administrative capabilities of the permitting agencies for at least the near future. Thus, the 6-year exclusion is necessary to provide these agencies and their permittees certainty that this will not occur.

We recognize that at present, we do not have data that would allow us to compile administrative burden estimates for specific levels between the 50,000/50,000 and 25,000/25,000 tpy CO₂e levels we assessed. However, it is clear that the burdens begin to rise sharply below the 50,000/50,000 tpy CO₂e level. To reiterate, the combined PSD and title V administrative burdens at the 50,000/50,000 tpy CO₂e level cost almost twice as much as the current programs, but the burdens at the 25,000/25,000 tpy CO₂e level cost almost four times as much as the current programs. As a result, we conclude that dropping the level below 50,000/50,000 tpy CO₂e too soon would quickly expose the permitting authorities to unacceptably high burdens.

As a further reason for concluding that we will not reduce thresholds beyond 50,000/50,000 tpy CO₂e during the first 6 years, we recognize that the PSD permitting process in particular carries important ramifications for the permitting authorities and the affected sources. If we have underestimated the permitting burden or the ability of states to respond to their additional workload, then permitting backlogs will result, and PSD permit issuance will be delayed, and sources seeking a PSD permit will not be able to construct or modify. If this were to happen on a large enough scale, it could have potentially serious consequences for the national economy.

Moreover, we need to be mindful that the best information we currently have as to permitting authority burdens represents a national average, as described previously. Our information at the individual state and local level, where permitting occurs, is not as robust. Accordingly, we recognize that a particular state may encounter permitting costs that are higher than average, and this may result in permitting backlogs in that state, with

the consequence that sources in that state will face long delays in constructing or modifying. Similarly, even if a particular state's costs are in line with the national average, that state may not be able to find the additional resources to cover those costs as readily as other states. For this reason, too, sources in that state could face long delays in constructing or modifying.

Beyond the administrative burdens to permitting authorities, we recognize that the costs of PSD and title V permitting to sources may be high, and we are not inclined to allow their imposition at this time on sources smaller than the 50,000/50,000 tpy CO₂e threshold. At that level, the permitting programs will apply to a significant number of newly permitted sources, including a variety of small manufacturing, commercial and residential categories. The next level that we have analyzed is the 25,000/25,000 tpy CO₂e threshold. At that level, more than 7,000 more sources would become subject to PSD each year—almost all due to modifications—and another 4,000 sources would become subject to title V each year. These sources would be even smaller than those that already will have become subject to PSD and title V due to their GHG emissions. We do not think it reasonable to subject more of those types of sources, and smaller ones, to permitting costs within the next 6 years.

Finally, we note that moving from a 50,000 tpy CO₂e threshold to 25,000 tpy CO₂e will increase the emissions coverage of GHG stationary sources from 70 percent to 75 percent nationwide, which we consider to be a relatively small amount.

We recognize that our progress in developing streamlining methods will be a key determinant to the ability of permitting authorities to administer, and sources to comply with, PSD and title V at GHG emission levels below 50,000/50,000 tpy CO₂e. Although we commit to pursue streamlining, we cannot predict our progress. This uncertainty may be problematic for stakeholders, primarily permitting authorities and industry. That is, permitting authorities will face uncertainty in planning the scope of their programs over the next few years, and industry will face uncertainty as to what new construction projects and modifications will be subject to PSD for GHGs. By determining now that for the next 6 years we will not impose PSD requirements below a floor at the 50,000/50,000 tpy CO₂e level, we add a measure of needed certainty.

We also recognize that selecting a level that is too high or keeping a level for too long means that some sources

may construct or modify without implementing BACT level controls, and this could result in additional emissions of GHGs. We need to be vigilant and to protect against this outcome. Even so, all things considered, we believe that our determination not to apply the PSD or title V permitting requirements to sources below the 50,000/50,000 tpy CO₂e level for the first 6 years also represents a reasonable balancing of protection of the environment with promotion of economic development. This type of balancing is consistent with our authority under the PSD provisions.

We also raised the issue of “hollow” or “empty” permits in discussing our rationale for why it may make sense to delay title V permitting under our proposal. We were concerned that many title V permits for GHG sources would contain no applicable requirements, and their issuance would therefore be of little value and would not be the best use of scarce resources. Several commenters agreed that implementing title V for GHGs will, at least initially, require “empty permits” to be issued to GHG sources because such sources will not be subject to “substantive” requirements, and that this would not be the best use of scarce resources.

We believe that the amount of resources that would be spent on, and the limited value that would result from, “empty permits” does warrant consideration under the *Chevron* analysis, taking account of the “absurd results” doctrine. Therefore, we intend to consider the role of “empty permits” when we undertake future rulemaking. However, we believe the issue of “empty permits” has limited or no relevance to the first two steps of the phase-in that we are promulgating in this rule. During Step 1, permitting for GHGs is only required if the source is otherwise subject to permitting for its emissions of non-GHGs. Those sources very likely will be subject to existing substantive applicable requirements for non-GHGs (e.g., NSPS, Maximum Achievable Control Technology (MACT), and SIP requirements, including PSD). Thus, there should be no, or at least no additional, “empty permits” during Step 1. For Step 2, it is possible that sources that become subject to title V requirements for GHG emissions may not be subject to other requirements, but our assessment suggests that this is very unlikely. We estimate that virtually all of the 550 newly-major sources in Step 2 will be subject to applicable requirements under the CAA because they are from categories that have been traditionally subject to regulations, such as smaller industrial sources from already regulated categories, large

landfills, and oil/gas/coal production. Even the approximately 50 newly-subject commercial sources in Step 2, which we estimate to be comprised of very large hospitals, are likely to be covered by standards for medical waste incinerators. In addition, we expect these sources may well be subject to SIP requirements. Thus, we do not expect any, or at most very few “empty permits” during Step 2.

In later stages of implementation (e.g., prospective Step 3) or in the event that we permit smaller, non-traditional sources of GHGs that have never otherwise been subject to major source permitting, there would be a greater potential for “empty permits” to be issued under title V. Cognizant of this, we intend to further explore in the rulemaking for Step 3 “empty permit” theories under the “absurd results” rationale that may serve to permanently narrow the scope of title V to exclude sources that would potentially be required to obtain an “empty permit” due to GHG emissions.

In this action, EPA is also finalizing its proposal to commit to conduct an assessment of the threshold levels—to be completed in 2015, 5 years after this action—that will examine the permitting authorities’ progress in implementing the PSD and title V programs for GHG sources as well as EPA’s and the permitting authorities’ progress in developing streamlining methods. We further commit to undertake another round of rulemaking—beginning after the assessment is done, and to be completed by April 30, 2016—to address smaller sources.

We disagree with the commenter who asserted that we do not need 6 years to study and implement PSD and title V for smaller sources. As we discussed in the proposal, and reiterate in this final action, we do not have sufficient information at this time to determine the applicability and effectiveness of the various permitting streamlining techniques. For reasons discussed in more detail in section V.E.1 regarding streamlining, we are not now able to determine how such techniques will be implemented or whether they will prove viable or effective. We agree with the commenter that these measures may reduce the scope, cost, and complexity of these programs, but there is considerable uncertainty as to the extent of this effect. We do commit in this action to fully investigate, propose, and evaluate permit streamlining techniques to determine where they may have applications, how they would be applied, and whether they can withstand legal challenge. Even for

those techniques that may ultimately be deemed viable, there is a significant time period necessary for rulemaking and state adoption, all of which could take up to 3 years or more. We also note that we will be required to complete our study of the effectiveness of these techniques within 5 years, meaning that, in order to complete it in time, we will essentially need to begin the study as soon as relevant data are starting to become available. Finally, the sixth year, in which EPA must complete rulemaking, requires proposal and promulgation of a rule within 1 year, which is an ambitious schedule.

Therefore we believe that 6 years is appropriate for this type of effort. We also have received a substantial number of comments from permitting authorities that agreed with our 5-year timeframe, or a greater timeframe, to get more prepared for permitting smaller sources.

d. Other Comments on “Absurd Results” Doctrine

We received other comments on our application of the “absurd results” doctrine, which we respond to in the RTC document. One comment was overarching, and so we respond to it here: Commenters have asserted that under the “absurd results” doctrine, EPA does not have authority to, or at least should not, promulgate the endangerment/cause or contribute findings (which we will sometimes refer to as the “findings”) or the LDVR because doing so would trigger the PSD and title V requirements, which in turn would give rise to “absurd results”. According to commenters, under the “absurd results” case law, EPA is obliged to avoid taking any action that would trigger absurd results and in this case that means foregoing the endangerment/cause or contribute findings and/or the LDVR, or at least deferring finalizing them until EPA has time to streamline PSD and title V requirements so as to avoid “absurd results”. Commenters made the related comment that if we promulgate the LDVR, and thereby trigger PSD, we cannot rely on the “absurd results” doctrine because it is our own actions—the promulgation of the LDVR—that will have given rise to the “absurd results,” and under those circumstances, the doctrine is not available.

The comments that EPA had no authority to promulgate, or should not have promulgated, the endangerment/cause or contribute findings or the LDVR at the times that EPA did are not relevant to this rule, the Tailoring Rule. EPA has already promulgated the findings and the LDVR, and the LDVR triggers PSD and title V applicability, as

we have seen. These comments would have been relevant only to the proposed findings and LDVR, and we are not, in this rulemaking, revisiting or reopening the findings or the LDVR.⁴⁸

Commenters claim that if EPA promulgates the LDVR, the “absurd results” doctrine will no longer apply to the Tailoring Rule because it will have been EPA’s own action—promulgation of the LDVR—that gives rise to the “absurd results”. We disagree for several reasons. For one thing, commenters have not cited case law, and our research has disclosed none, in which a court specifically addressed a similar situation and issued a holding along the lines of what commenters urge. Moreover, commenters’ approach would be punitive because the absurd results would occur absent this rule going final. Such an outcome would be counter to the purpose of the doctrine. That is, it would mean that PSD and title V would apply to GHG sources by their terms—at the statutory levels, as of January 2, 2011—with all the adverse consequences described elsewhere.

In any event, and although we are not obligated to respond to these comments on the merits, they are incorrect on the merits, for the reasons that follow. This discussion should not be viewed as reopening the endangerment/cause or contribute findings or the LDVR because, as stated previously, we are not reconsidering or reopening those two actions in this rule.

In determining and implementing congressional intent, it is important that the statutory provisions at issue be considered together—(1) The obligation to make a determination on endangerment and contribution under CAA section 202(a); (2) if affirmative endangerment/cause or contribute findings are made, the obligation to promulgate standards applicable to the emission of any air pollutant from new motor vehicles or new motor vehicle engines under CAA section 202(a); and (3) the PSD and title V applicability provisions. The most appropriate reading, and certainly a reasonable reading, is that we are required to take the action we have taken, and are taking with this rule, and that is to issue the findings, promulgate the LDVR, and promulgate the Tailoring Rule. Our approach gives effect to as much of Congress’s intent for each of these provisions, and the CAA as a whole, as possible.

⁴⁸ EPA does have pending before it ten petitions to reconsider the endangerment and cause or contribute findings. EPA is carefully evaluating those petitions and expects to issue its decision(s) on or about July 30, 2010.

With respect to the endangerment/cause or contribute findings under CAA section 202(a), congressional intent is clear that, as we stated in making the findings and the Supreme Court held in *Massachusetts v. EPA*, we are precluded from considering factors other than the science based factors relevant to determining the health and welfare effects of the air pollution in question. Accordingly, EPA determined that under *Massachusetts v. EPA*, 549 U.S. 497 (2007) we were precluded from deferring or foregoing the findings due to concern over impacts on stationary sources affected by PSD or title V requirements. See 74 FR at 66496, 66500–01 (“Taken as a whole, the Supreme Court’s decision clearly indicates that policy reasons do not justify the Administrator avoiding taking further action on the questions here.”); see also *Massachusetts v. EPA*, 549 U.S. at 533; see also 74 FR at 66515–16 (December 9, 2009). (The Administrator “must base her decision about endangerment on the science, and not on the policy considerations about the repercussions or impact of such a finding”).⁴⁹ Moreover, as EPA also noted, “EPA has the ability to fashion a reasonable and common-sense approach to address greenhouse gas emissions and climate change.” 74 FR at 66516.

Regarding the timing of the LDVR, Congress’s intent was that endangerment/cause or contribute findings under section 202(a) would in fact lead to control of the air pollutants from new motor vehicles and new motor vehicle engines contributing to the harm. The primary goal of section 202(a) is to achieve such reductions by requiring that EPA adopt emissions standards, and as a result, proceeding with the LDVR is consistent with that goal. In contrast, deferring the LDVR and thereby delaying achievement of the public health and welfare benefits Congress expected and required under section 202(a) would run directly counter to what Congress intended under section 202(a)—EPA issuing emissions standards to address the public health and welfare problems that were identified, not EPA refusing to do so.

Moreover, we have compelling reasons to proceed with the LDVR, in the manner that we did. As we stated in the LDVR, in response to similar comments that we were not obligated to

⁴⁹ Note, that at least one petition for reconsideration on the endangerment/contribution findings raises the same arguments related to the timing of decisions and absurd results. As noted before, EPA is carefully evaluating all the pending petitions for reconsideration.

conduct that rulemaking, or to conduct it at the time that we did:

Some of the comments relating to the stationary source permitting issues suggested that EPA should defer setting GHG standards for new motor vehicles to avoid * * * [adverse] stationary source permitting impacts. EPA is issuing these final GHG standards for light-duty vehicles as part of its efforts to expeditiously respond to the Supreme Court's nearly three year old ruling in *Massachusetts v. EPA*, 549 U.S. 497 (2007). In that case, the Court held that greenhouse gases fit within the definition of air pollutant in the Clean Air Act, and that EPA is therefore compelled to respond to the rulemaking petition under section 202(a) by determining whether or not emissions from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. The Court further ruled that, in making these decisions, the EPA Administrator is required to follow the language of section 202(a) of the CAA. The Court stated that under section 202(a), "[i]f EPA makes [the endangerment and cause or contribute findings], the Clean Air Act requires the agency to regulate emissions of the deleterious pollutant." 549 U.S. at 534. As discussed above, EPA has made the two findings on contribution and endangerment. 74 FR 66496 (December 15, 2009). Thus, EPA is required to issue standards applicable to emissions of this air pollutant from new motor vehicles.

The Court properly noted that EPA retained "significant latitude" as to the "timing * * * and coordination of its regulations with those of other agencies" (id.). However it has now been nearly three years since the Court issued its opinion, and the time for delay has passed. In the absence of these final standards, there would be three separate federal and state regimes independently regulating light-duty vehicles to increase fuel economy and reduce GHG emissions: NHTSA's CAFE standards, EPA's GHG standards, and the GHG standards applicable in California and other states adopting the California standards. This joint EPA-NHTSA program will allow automakers to meet all of these requirements with a single national fleet because California has indicated that it will accept compliance with EPA's GHG standards as compliance with California's GHG standards. 74 FR at 49460. California has not indicated that it would accept NHTSA's CAFE standards by themselves. Without EPA's vehicle GHG standards, the states will not offer the federal program as an alternative compliance option to automakers and the benefits of a harmonized national program will be lost. California and several other states have expressed strong concern that, without comparable federal vehicle GHG standards, the states will not offer the federal program as an alternative compliance option to automakers. Letter dated February 23, 2010 from Commissioners of California, Maine, New Mexico, Oregon and Washington to Senators Harry Reid and Mitch McConnell (Docket EPA-HQ-OAR-2009-0472-11400). The automobile industry also strongly

supports issuance of these rules to allow implementation of the national program and avoid "a myriad of problems for the auto industry in terms of product planning, vehicle distribution, adverse economic impacts and, most importantly, adverse consequences for their dealers and customers." Letter dated March 17, 2010 from Alliance of Automobile Manufacturers to Senators Harry Reid and Mitch McConnell, and Representatives Nancy Pelosi and John Boehner (Docket EPA-HQ-OAR-2009-0472-11368). Thus, without EPA's GHG standards as part of a federal harmonized program, important GHG reductions as well as benefits to the automakers and to consumers would be lost.¹⁶⁵ In addition, delaying the rule would impose significant burdens and uncertainty on automakers, who are already well into planning for production of MY 2012 vehicles, relying on the ability to produce a single national fleet. Delaying the issuance of this final rule would very seriously disrupt the industry's plans.

Instead of delaying the LDV rule and losing the benefits of this rule and the harmonized national program, EPA is directly addressing concerns about stationary source permitting in other actions that EPA is taking with regard to such permitting. That is the proper approach to address the issue of stationary source permitting, as compared to delaying the issuance of this rule for some undefined, indefinite time period.

75 FR 25,402 cols. 1-3 (May 7, 2010) (footnote omitted).

With respect to both the endangerment/cause or contribute findings and the LDVR, it would require speculation and conjecture to defer—or, certainly, to forego altogether—the findings or LDVR until EPA completed streamlining the PSD and title V requirements on grounds that doing so would allow full compliance in the future with all PSD and title V statutory provisions. That is the gist of commenters' argument—that EPA should defer or forego issuance of the findings and the LDVR to avoid causing an absurd result from implementation of the separate PSD and title V programs. Underlying this claim is the assumption that this would allow EPA to avoid the "absurd results". As we discuss elsewhere in this rulemaking, there is no basis at this point to determine that streamlining will ultimately allow full compliance with the PSD and title V requirements. Rather, it is possible that EPA may conclude that none of the available streamlining techniques will allow all GHG sources at the statutory thresholds to comply with PSD and title V requirements in a manner that does not impose undue costs on the sources or undue administrative burdens on the permitting authorities. Under these circumstances, EPA may then permanently exclude GHG source categories from PSD or title V applicability under the absurd results

doctrine. Moreover, it may well take many years before EPA is in a position to come to a conclusion about the extent to which streamlining will be effective and therefore be able to come to a conclusion as to whether any source categories should be permanently excluded from PSD or title V applicability. In our rulemaking today, we describe what actions we expect to take in the first 6 years after PSD and title V are triggered for GHG sources, and we may well be in a situation in which we continue to evaluate streamlining measures and PSD and title V applicability to GHG sources after this 6-year period.

Accordingly, deferring the endangerment/cause or contribute findings and LDVR until such time that PSD and title V streamlining would allow full implementation of these programs at the statutory limits would serve only to delay the benefits of the LDVR, as well as the benefits that come from phasing in implementation of the PSD program to cover larger sources first. It would rely on an assumption that is unfounded at this point, that is, that such full compliance will be required at some point in the future. Delaying the emissions benefits of the LDVR and the related emissions benefits from partial implementation of the PSD program fails to implement Congress' intent that the endangerment/cause or contribute findings "shall" lead to emissions standards for new motor vehicles contributing to the endangerment, and related emissions controls for the same air pollutant under the PSD program. EPA need not determine at this time what approach would be appropriate if there was a determination that full compliance with PSD and title V would in fact occur at some point in the future. In this case, absent such a determination, it would be improper to rely on speculation of such a future possibility as a basis under section 202(a) to defer or forego issuance of the LDVR on the grounds that EPA should defer or forego the LDVR to avoid causing an absurd result. Likewise there is no basis to defer proceeding at this time with the streamlining of the PSD and title V programs.

With respect to the PSD and title V applicability requirements, as we discuss elsewhere, we believe that Congress expressed a clear intent to apply PSD and title V to GHG sources and that the phase-in approach incorporated in the Tailoring Rule is fully appropriate. Proceeding now with the endangerment/contribution findings and LDVR, even if phasing-in of the PSD and title V programs is required, is

consistent with our interpretation of the PSD and title V applicability requirements. Delaying the endangerment/contribution findings or LDVR, and thereby delaying the triggering of PSD and title V requirements for GHG sources, would lead to the loss of a practicable opportunity to implement the PSD and title V requirements in important part, and thereby lead to the loss of important benefits. As discussed elsewhere, promulgating the LDVR and applying the PSD and title V requirements to the largest GHG sources, as we do in this Tailoring Rule, is practicable because the sources that would be affected by the initial implementation steps we promulgate in this rule are able to bear the costs and the permitting authorities are able to bear the associated administrative burdens. Promulgating the LDVR now provides important advantages because the sources that would be affected by the initial steps are responsible for most of the GHG emissions from stationary sources.

It should also be noted that as discussed elsewhere in this rulemaking, our ability to develop appropriate streamlining techniques for PSD and title V requirements is best done within the context of actual implementation of the permitting programs, and not in isolation of them. That is, because the great majority of GHG sources have not been subject to PSD and title V requirements, we will need to rely on the early experience in implementing the permitting requirements for the very large sources that initially will be subject to those requirements in order to develop streamlining techniques for smaller sources. It is the real world experience gained from this initial phase that will allow EPA to develop any further modifications that might be necessary. This would not and could not occur if the LDVR were delayed indefinitely or permanently, so that PSD and title V requirements were not triggered. It is unrealistic to expect that delaying action until a future tailoring rule could resolve all of the problems identified in this rulemaking, absent any real world implementation experience.

At its core, commenters' argument is that EPA should delay (if not forego altogether) doing *anything* to address GHG emissions and the problems they cause until it can do so in a way that does not cause any implementation challenges, even if that delay results in continued endangerment to public health and welfare. EPA does not take such a myopic view of its duties and responsibilities under the CAA. Congress wrote the CAA to, among other things, promote the public health and

welfare and the productive capacity of the population. CAA § 101(b)(1). EPA's path forward does just this. Thus, proceeding with the endangerment/cause or contribute findings, the LDVR, and with PSD and title V through the phase-in approach of the Tailoring Rule maximizes the ability of EPA to achieve the Congressional goals underlying sections 202(a) and the PSD and title V provisions, and the overarching CAA goal of protecting public health and welfare. Congress called for EPA (1) To determine whether emissions from new motor vehicles contribute to air pollution that endangers, (2) if that the determination is affirmative, to issue emissions standards for new motor vehicles to address the endangerment, and (3) to implement the PSD and Title V program to address similar emissions in their permitting program as another tool to address the air pollutant at issue. Delaying both the LDVR and PSD/title V implementation, as commenters have called for, would run directly counter to these Congressional expectations. Commenters' calls for deferral or foregoing of the findings or LDVR are generally phrased in a conclusory fashion, and do not demonstrate how EPA could take the required CAA actions concerning GHGs while remaining within the requirements of each of the various CAA provisions, and achieving the overall goals of the CAA. As such the comments do not provide a valid basis for the deferral of agency action they suggest.

9. "Administrative Necessity" Basis for PSD and Title V Requirements in Tailoring Rule

EPA believes that the "administrative necessity" doctrine, within the *Chevron* framework, also justifies this rulemaking. Applying the applicability requirements of the PSD and title V programs according to a literal reading of their terms (as EPA has narrowed them in the past through interpretation) to GHG sources beginning on the January 2, 2011 date that regulation of GHGs takes effect would sweep so many sources into those programs as to render the programs impossible for the permitting authorities to administer. Although streamlining the PSD and title V programs offers some promise to improve the administrability of the programs, given the time needed to implement such streamlining, the step-by-step expansion of PSD and title V requirements to GHG sources that we are promulgating is the most that the permitting authorities can reasonably be expected to administer.

This section discusses the application of the "administrative necessity"

doctrine. Our views concerning this doctrine remain similar to what we said at proposal, except that in this rulemaking we place the doctrine more clearly in the *Chevron* analytical framework, we revise our assessment of the administrative burdens due to new analysis we have conducted and information we have received since proposal, and we make certain revisions to the tailoring approach.⁵⁰ This analysis and information, as well as the revisions to the tailoring approach, have already been presented previously, in the discussion of the "absurd results" basis. In addition, it is not necessary to reiterate the lengthy discussion of the "administrative necessity" doctrine that we included in the proposal or the factual data presented previously; as a result, this section briefly highlights the conclusions we have reached about the application of this doctrine.

As noted previously, under the PSD and title V applicability provision—read literally, as we have long interpreted them—EPA's recent promulgation of the LDVR will trigger the applicability of PSD and title V for GHG sources at the 100/250 tpy and 100 tpy threshold levels, respectively, as of January 2, 2011. This is because PSD applicability hinges on the definition of "major emitting facility" and title V applicability hinges on the definition of "major sources," and those terms, read literally, and under EPA's long-standing narrowing interpretation, apply PSD and title V, respectively, to sources of any air pollutant that is subject to regulation under another provision of the CAA. EPA's promulgation of the LDVR means that GHGs will become subject to regulation on the date that the rule takes effect, which will be January 2, 2011.

Absent tailoring, the January 2, 2011 trigger date for GHG PSD applicability will give rise to an extraordinarily large number of PSD permitting actions—we estimate more than 81,000 per year—representing an increase of almost 300-fold over the current 280 PSD permitting actions each year. In addition, over 6 million sources will become subject to title V, an increase of

⁵⁰ In addition, we base our reliance on the "administrative necessity" doctrine on the administrative burdens to the permitting authorities of permitting smaller GHG sources, but not on the relatively small amount of GHG emissions associated with the smaller sources. See *Alabama Power v. Costle*, 636 F.2d 323, 357 (DC Cir. 1980) (establishing the "administrative necessity" doctrine as "inherent in the administrative process" and presumptively available under the statutory scheme, absent clear congressional intent to the contrary; but adding that in contrast, "there exists no general administrative power to create exemptions to statutory requirements based upon the agency's perceptions of costs and benefits").

more than 400-fold over the 14,700 sources that currently are subject to title V. The permitting authorities will find it impossible to administer programs of these sizes as of that date.

All this results from a literal application of the PSD and title V applicability provisions to GHG sources. However, under *Chevron*, we must interpret and apply statutory requirements on the basis of congressional intent. Although the literal meaning of the statutory provisions is the first and generally the best indicator of congressional intent, there are cases in which that is not so. As discussed previously, we believe that as a general matter, statutory directives should be considered to incorporate Congress's intent that they be administrable, and we believe that this proposition is implicit in the "administrative necessity" doctrine that the DC Circuit has established and that we believe applies here. See *Alabama Power v. Costle*, 636 F.2d 323, 356–57 (DC Cir. 1980). This doctrine authorizes EPA to undertake a process for rendering the PSD and title V requirements administrable. Indeed, the Court in *Alabama Power* established this doctrine specifically in the context of the PSD provisions, including, in particular, the modification provision. As noted elsewhere, the Court held that EPA may "consider the administrative burden" associated with applying PSD for emissions increases, and establish significance levels designed to avoid "severe administrative burdens on EPA, as well as severe economic burdens" on sources. *Id.* at 405.

As we said in the proposal, we read the case law to establish a three-step approach for implementing the "administrative necessity" doctrine: An agency is not required to adhere to literal statutory requirements if the agency, as the first step, makes every effort to adjust the requirements within the statutory constraints, but concludes with justification—at the second step—that it would be impossible to comply with the literal reading of the statute. Under those circumstances, the agency may—at the third step—develop what is in effect a compliance schedule with the statutory requirements, under which the agency will implement the statute as much as administratively possible and as quickly as administratively possible. See 74 FR 55315–55316.

a. First Step of the "Administrative Necessity" Analysis: Streamlining

In the proposed rulemaking, EPA discussed at length the prospect of streamlining both PSD and title V. EPA described "several potentially useful

tools available in the streamlining toolbox for the PSD permitting threshold level, the PSD significance level, and the title V permitting threshold," specifically:

For the PSD permitting threshold level and significance level, there are at least three such tools: The first is interpreting the definition of "potential to emit" so that the amount of a source's emissions that counts in determining whether it qualifies as a major source and therefore is above the permitting threshold requirements is closer to the amount of its emissions when it is in actual operation, rather than the amount of emissions that the source would emit if it were operating continuously. Narrowing the definition of PTE is a potentially extremely important tool in this context because identifying the amount of a source's emissions as closer to its actual emissions in this manner would mean that very large numbers of residential and commercial sources would have significantly lower emissions and would fall below the statutory threshold requirements for triggering PSD. Second, EPA believes it may be able to develop programs involving general permits, under which large numbers of similarly situated sources would each be covered by essentially the same permit established through a regulatory action by the permitting authority. This approach could achieve economies of scale and thereby reduce administrative burden. Third, EPA believes it may be able to streamline the single most time-consuming element of the PSD permit program, which is the determination of BACT as required under CAA § 165(a)(4), by establishing presumptive BACT levels for certain source categories that comprise large numbers of sources. As for title V, as discussed below in detail, EPA believes that defining "potential to emit" to reflect more closely a source's actual operation and developing a program of general permits could streamline the administration of title V permits.

74 FR 55315 col. 2–3.

At proposal we stated that we would, and we still commit to, vigorously pursue development of these streamlining measures, and, as indicated in our discussion of streamlining methods in section V.E.1 and in response to comments, we have already begun developing those measures. For example, as described elsewhere, we have done much work—both with stakeholders and in-house—to begin to develop recommendations for what controls would qualify as BACT for various industries. This work is important as a foundation for developing presumptive BACT, which is a potentially efficient streamlining measure.

However, it is not possible for us or the state and local permitting authorities to develop and implement streamlining techniques by the time that PSD and title V are triggered for sources emitting

GHGs—January 2, 2011—or shortly thereafter. Developing streamlining methods would entail acquiring more information about the affected industry, may entail rulemaking, and would likely entail some type of public review of proposals for streamlining even if not done through rulemaking. As discussed in section V.E, we do not expect that we could complete all those steps for meaningful streamlining measures within 2 years.

b. Second Step of the "Administrative Necessity" Analysis: Demonstration of Administrative Impossibility

With no streamlining measures available at the time that PSD and title V would apply to sources of GHGs or shortly thereafter, under the second step of the "administrative necessity" analysis, we must determine whether implementation of the statutory requirements at that time would be administratively impossible for the permitting authorities. We are mindful that the DC Circuit has cautioned that this showing is a high hurdle. See 74 FR 55317.

Even so, we believe there is no question that a literal application of the PSD and title V programs to GHG sources as of January 2, 2011 would be flatly impossible for the state and local permitting authorities to administer for at least an initial period of time.⁵¹ The key facts have been recounted previously, and no more than a brief recitation is necessary here. On the PSD side, annual permit applications would increase by over 300-fold, from 280 to almost 82,000; costs to the permitting authorities would increase more than 100-fold, from \$12 million to \$1.5 billion; and the permitting authorities would need to hire, train, and manage 9,772 FTEs. For title V, total permit applications would increase by over 400-fold, from 14,700 to 6.1 million; costs to the permitting authorities would increase from \$62 million to \$21 billion; and the permitting authorities would need to hire, train, and manage 229,118 FTEs.

We have elaborated upon these burdens elsewhere in this notice. They bespeak an impossible administrative task. It is not hyperbole to say that if these administrative responsibilities are not considered impossible within the

⁵¹ We recognize that in a few states, we are the permitting authority. We do not think that this changes the calculation of administrative burdens. We do not believe that we could reasonably be expected to adjust our budget to accommodate the large new permitting burdens, and even if we could, the administrative burdens would remain in most of the rest of the nation where it is the state or local agencies that bear permitting responsibility.

meaning of the “administrative necessity” doctrine, then it is difficult to imagine what would be considered impossible.

c. Third Step of the “Administrative Necessity” Analysis: Tailoring

Under the third step of the “administrative necessity” analysis, we must demonstrate that the steps we intend to take towards implementation of the statutory requirements are the most that can be done during the indicated time frames, in light of administrative resources. In this manner, we adhere most closely to the statutory requirements. *See* 74 FR 55318. This amounts to establishing a schedule for phasing in PSD and title V applicability to GHG sources. Because this step is based on the administrative resources of the permitting authorities, our analysis is similar, and leads to the same conclusions, as we described previously concerning the “absurd results” basis. That is, we believe that our tailoring approach—including Step 1, to be implemented as of January 2, 2011; Step 2, to be implemented as of July 1, 2011; the additional rulemaking that we commit to finalize by July 1, 2012, and that will address further threshold reductions as a Step 3; the study and subsequent rulemaking to address smaller sources by April 30, 2016; and the determination not to lower the threshold below 50,000/50,000 tpy CO₂e before April 30, 2016 at the earliest—is the most that we can do to expand the PSD and title V programs, based on administrative resources and the information we currently have about the prospects for streamlining and increasing permitting resources.

As noted previously, at some point in the process of additional rulemaking, we may conclude under the “absurd results” doctrine that we will not apply PSD or title V to GHG sources below a certain size level. The same conclusion may be supportable under the “administrative necessity” doctrine if we decide, based on the information available to us, that even with all of the streamlining that we are able to accomplish and even with a significant expansion of permitting resources, it may not be administratively feasible to implement PSD or title V to sources below that level. *See Alabama Power v. Costle*, 636 F.2d at 358 (acknowledging, in discussing the “administrative necessity” doctrine, that “[c]ategorical exemptions from the clear commands of a regulatory statute [are] sometimes permitted,” although emphasizing that such exemptions “are not favored”).

In addition, as noted above, in a subsequent rulemaking, we may conclude that title V should not apply to GHG sources with “empty permits,” under the “absurd results” doctrine. The basis for this conclusion could be a determination that (1) although the applicability provisions apply by their terms to sources on the basis of their emissions, and without regard to whether the sources would hold “empty permits,” those provisions cannot be read literally under the “absurd results” doctrine; and (2) it is not clear whether Congress intended that title V apply to such sources, and EPA has reasonably determined, under *Chevron* Step 2, that title V does not. If we come to that conclusion, then, at that point in time, the “administrative necessity” doctrine would remain relevant for title V purposes only if it is necessary, for administrative reasons, to phase in the application of title V to GHG sources that have applicable requirements, and that therefore do not have “empty permits.” This is because the “administrative necessity” doctrine is relevant only when a statutory directive, read literally, imposes impossible administrative obligations, and Congress may be presumed to have intended that the directive be administrable. The “administrative necessity” doctrine would not come into play if it is concluded either that under the “absurd results” doctrine Congress did not intend the statutory directive or that, under that doctrine, Congress’s intent was not clear and EPA reasonably decided that the directive does not apply.

10. “One-Step-at-a-Time” Basis for Tailoring Rule

In addition to the “absurd results” and “administrative necessity” doctrines, the “one-step-at-a-time” judicial doctrine, within the *Chevron* framework, supports EPA’s Tailoring Rule. The case law under this doctrine, described previously, indicates that the doctrine justifies an agency’s step-by-step approach under the following circumstances or conditions: (1) The agency’s ability to comply with a statutory directive depends on facts, policies, or future events that are uncertain; (2) the agency has estimated the extent of its remaining obligation; (3) the agency’s incremental actions are structured in a manner that is reasonable in light of the uncertainties; and (4) the agency is on track to full compliance with the statutory requirements. EPA’s Tailoring Rule fulfills each of those four.

First, as the DC Circuit stated in *National Association of Broadcaster v.*

FCC, 740 F.2d 1190, 1210 (DC Cir. 1984) (“*National Association of Broadcasters*”), incremental agency action is most readily justifiable “against a shifting background in which facts, predictions, and policies are in flux and in which an agency would be paralyzed if all the necessary answers had to be in before any action at all could be taken.” Those circumstances are present here, and so is that fact that the task at hand is extraordinarily demanding. As discussed previously, EPA and the permitting authorities’ progress in implementing the PSD and title V programs for GHG sources will depend in large measure on the development of streamlining measures and increases in permitting authorities’ resources, and those things carry some uncertainty and in any event, under the best of circumstances, cannot have much impact for at least several years. It will take EPA that long to develop streamlining measures, and it will take permitting authorities that long to begin to raise money and hire and train FTEs.

Second, as the Court stated in *National Association of Broadcasters*, “the agency [should] ma[k]e some estimation, based upon evolving economic and technological conditions, as to the nature and magnitude of the problem it will have to confront when it comes to [undertake the remaining steps]” and that estimation must be “plausible and flow from the factual record compiled.” *Id.* at 1210. Here, EPA has done this by estimating the number of PSD and title V permits and the costs of issuing them, and has provided as much information as possible about the development of streamlining methods and permitting authority resources.

Third, again as the Court stated in *National Association of Broadcasters*, it must be “reasonable, in the context of the decisions made in the proceeding under review, for the agency to have deferred the issue to the future. With respect to that question, postponement will be most easily justified when an agency acts against a background of rapid technical and social change and when the agency’s initial decision as a practical matter is reversible should the future proceedings yield drastically unexpected results.” *Id.* at 1211. Here, our tailoring approach is reasonable in light of changes in permitting authority capacity that may occur with the development of streamlining methods and increased resources. In addition, the first two steps that EPA promulgates today are reasonable initial steps that we expect to build on by lowering thresholds, as appropriate, in the future. We have no reason to suspect that we may need to reverse either of the first

two steps. Having received and analyzed extensive comment on the number of permitting actions to expect and on permitting authority resources, we consider it unlikely that we would need to establish a higher threshold level than what we have established in Steps 1 and 2. In addition, if we were to adopt an “empty permits” approach for title V, we would not need to reverse either of Steps 1 and 2, as explained above.

Finally, as the DC Circuit stated in *Grand Canyon Air Tour Coalition v. F.A.A.*, 154 F.3d 455, 477–78 (DC Cir. 1998), the Courts will accept an initial step towards full compliance with a statutory mandate, as long as the agency is headed towards full compliance, and we believe that the doctrine is applicable here. EPA intends to require full compliance with the CAA applicability provisions of the PSD and title V programs, but we believe that in the case of GHG-emitting sources, by application of the “absurd results” doctrine or the “administrative necessity” doctrine, full compliance with the applicability provisions does not necessarily mean full compliance with the literal terms of those provisions.⁵² Rather, as we have explained elsewhere, in the case of GHG sources, full compliance may mean compliance with higher levels that are consistent with congressional intent, under the “absurd results” doctrine, or that are within the reach of permitting authorities in light of their administrative constraints, under the “administrative necessity” doctrine. This rulemaking constitutes a package of initial steps towards that full compliance, and, seen in that light, is supported by the “one-step-at-a-time” doctrine.

Even if the doctrine were found to apply only when an agency is committed to fully implementing statutory requirements according to their literal terms, we believe that the steps we promulgate in this notice would be considered valid under the one-step-at-a-time doctrine. This is because even if we are incorrect about the applicability of the “absurd results” and “administrative necessity” doctrines, so that GHG sources are required to comply with the literal terms of the PSD and title V applicability provisions, the “one-step-at-a-time” doctrine would allow PSD

and title V applicability to be phased in, and the first two steps we promulgate in this notice would be upheld as reasonable initial steps toward full compliance with the literal terms of the CAA. As we have described elsewhere, there is little question but that sources and permitting authorities cannot reasonably be expected to comply with or implement PSD and title V applicability requirements in the near term—by January 2, 2011 and July 1, 2011—except to the limited extent described under Steps 1 and 2. Nor is applicability of the PSD and title V requirements at levels below 50,000 tpy CO₂e reasonable before 6 years from promulgation of this rule, as discussed elsewhere. If further steps resulting in full compliance with the literal terms of the applicability provisions of PSD and title V were required, it would be reasonable for those steps to occur in the future, as part of the rulemaking to be completed by the sixth year after promulgation, to which EPA commits itself as part of this action, or as part of subsequent actions. See *Grand Canyon Air Tour*, 891 F.2d at 476–77 (upholding agency action as a step towards full compliance with statutory mandate when the agency expected full compliance to occur some 20 years after the deadline in the statute).

C. Mechanisms for Implementing and Adopting the Tailoring Approach

In this section, we discuss three issues related to adoption of the tailoring approach within our regulations and by permitting agencies. The first is the regulatory mechanism for implementing the tailoring approach—that is, the specific way we are revising the PSD and title V applicability provisions to incorporate the tailoring approach—and our rationale. The second is the process by which state or local permitting authorities may incorporate the tailoring approach into their PSD SIP and title V permit programs. Finally, we discuss our reasons for delaying action on our proposal to limit approval of both SIP-approved PSD programs and title V programs, and we request certain information from states on both of their programs and their actions in response to this rule.

In brief, we proposed to exempt sources emitting GHGs below certain threshold levels from the definition of the regulatory terms “major stationary source” and “major modification” in PSD programs and the definition of the regulatory term “major source” in title V programs. We further proposed to effectuate this change in SIP-approved PSD programs (as included in SIPs) and

EPA-approved part 70 title V programs by limiting our prior approval of those programs to the revised applicability thresholds for GHGs.⁵³ These changes would have the effect of putting the higher thresholds adopted under the Tailoring Rule in place in states PSD and title V programs as a matter of federal law. However, state commenters expressed concern that they would not be able to adopt the Tailoring Rule under state laws on an expeditious basis. To address this, our final action differs from our proposed rule in the way we incorporate the limitations promulgated in this Tailoring Rule into the “major stationary source,” “major modification” and “major source” definitions. This approach relies on further defining the term “subject to regulation” and although this approach is not substantively different in effect from the proposed rule, it will facilitate more rapid adoption and implementation of the Tailoring Rule by states through interpretation of language in existing state regulations. We believe these differences are a logical outgrowth of our proposed rule. We are also delaying action on our proposed limited approval of EPA-approved PSD programs and part 70 title programs to determine how each state will implement the final rules.

1. PSD Approach: Background and Proposal

Under CAA section 165(a), no “major emitting facility” may construct or modify unless it receives a preconstruction permit that meets the requirements of the PSD program. CAA section 169(1) defines a major emitting facility as “any * * * source[] in one of 28 specified source categories that “emit[s], or ha[s] the potential to emit, one hundred tons per year or more of any air pollutant;” or “any other source with the potential to emit two hundred and fifty tons per year or more of any air pollutant.” EPA’s regulations replace the term “major emitting facility” with the term “major stationary source” and define the term as “[a]ny of * * * [28 types of] stationary sources of air pollutants which emits, or has the potential to emit, 100 tons per year or more of any regulated NSR pollutant” or “any stationary source which emits, or has the potential to emit 250 tons per year or more of a regulated NSR pollutant.” 40 CFR 51.166(b)(1)(i)(a)–(b). The term “regulated NSR pollutant” is defined to include, among other things,

⁵² For reasons explained elsewhere, our reference to the literal terms of the applicability provisions means the literal terms of the definition of “major emitting facility” for PSD and “major source” for title V, as EPA has narrowed those definitions to refer to “any pollutant” that is subject to regulation under the CAA.

⁵³ In the alternative, we also proposed to use our section 110(k)(6) error correction authority to revise SIP-approved PSD program. We are also delaying action on this proposal.

“any * * * air pollutant that otherwise is subject to regulation under the Clean Air Act.” 40 CFR 51.166(b)(50). Note that the regulatory definition in effect interprets the statutory definition more narrowly to read “one hundred [or two hundred and fifty] tons per year or more of any air pollutant *subject to regulation under the Clean Air Act*” (emphasis added).

Similarly, under the statute, a modification occurs if there is a physical change or change in the method of operation “which increases the amount of any air pollutant emitted * * *.” CAA section 165(a), 169(2)(c), and 111(a)(4). As with the major stationary source definition, we have limited coverage of the modification provision to physical changes or changes in the method of operation that result a significant net emissions increase in emissions of a “regulated NSR pollutant.” 40 CFR 51.166(b)(2)(i).

Our proposed rule revised the definition of “major stationary source to (1) exempt GHG from the regulated NSR pollutants that, if emitted by a source in the 100 or 250 tpy quantities, would cause the source to qualify as a “major stationary source,” and (2) add a specific threshold at which a source that emits a specified quantity of GHGs (at proposal, that quantity was 25,000 tpy CO₂e) would qualify as a “major stationary source.” 74 FR 55351, proposed 40 CFR 51.166(b)(1)(i)(a), (b), and (d). We also proposed a significance threshold, which is the amount of an increase needed to trigger PSD for a modification or to require BACT for a new source, at a level between 10,000 and 25,000 tpy CO₂e. 74 FR 55351; 40 CFR 51.166(b)(23)(i).

Additionally, we recognized that it may take some time before states could change their SIP-approved PSD programs and that as a result, absent additional action on our part, GHG-emitting sources would remain subject to the 100 or 250 tpy thresholds, and subject to a zero significance threshold for major modifications as a matter of federal law. To address this issue, we proposed to narrow our previous approval of those SIPs. The effect of our proposal would be that EPA would have approved the SIP PSD programs only to the extent they apply PSD and requirements to GHG sources at or above the thresholds established in the Tailoring Rule (which, generally, were 25,000 tpy CO₂e), and EPA would have taken no action on the SIP PSD programs to the extent they apply PSD requirements to GHG sources below that threshold. We relied on the authority of the APA and the general authority of CAA section 301 and, in the alternative,

on the error correction mechanism under CAA section 110(k)(6). Our limited approval would revise existing EPA-approved SIP PSD programs to authorize permitting under the CAA only for GHG sources at the appropriate levels.

In response to our proposed approach, we received numerous comments from state and local permitting agencies expressing significant concern. They observed that our proposed approach could meet its objectives to avoid applying PSD requirements to small sources under federal law, but would not succeed in avoiding the application of PSD requirements to those small sources under *state* law. The commenters explained that, although EPA was changing federal PSD applicability thresholds; for GHG-emitting sources to incorporate the tailoring approach, and limiting the scope EPA approval of SIPs consistent with these thresholds, the state rules containing the originally-approved SIP thresholds would continue to apply as a matter of state law. As commenters explained, for the most part, the laws and regulations states adopt to implement federal PSD programs mirror EPA’s regulations, so that the state laws, apply PSD to sources that emit air pollutants subject to regulation at the 100/250 tpy threshold. Commenters reasoned that, until the states can change their state laws, the 100/250 tpy thresholds will continue to apply as a matter of state law, even though the higher thresholds apply as a matter of federal law.

Importantly, these commenters emphasized, their state process requires that they promulgate a rulemaking, or in some cases, a legislative change, to incorporate the higher thresholds for GHG sources in their SIPs. These processes would require many months and in some cases as long as 2 years. As a result, sources that emit GHGs below the federally established levels in the final rule, but at above the 100/250 tpy levels in state laws and rules, would still be required to obtain PSD permits under state law. As a result, states, in attempting to implement state permitting requirements, would be faced with the same administrative difficulties that EPA recognized in the proposed rule as impossible. Commenters emphasized that this situation was untenable.

In addition to the state comments just described, we received comments that took issue with our view that we were in effect revising the numerical thresholds for PSD applicability as the legal mechanism for the tailoring approach. They asserted that in fact, our

mechanism consisted of interpreting the term “any source” to exclude small GHG-emitting sources. Other commenters objected to our proposed mechanism of narrowing our previous SIP approval, arguing that this mechanism was without legal basis.

2. Rationale for Our Final Approach To Implementing PSD

In response to these concerns, we are adding another mechanism to implement the tailoring approach for PSD, and that is to adopt a definition, within our PSD regulations, the phrase “subject to regulation,” as found within the phrase “any regulated NSR pollutant,” which, in turn, is part of the definitions of “major stationary source” and “major modification.” To implement this mechanism, we are defining the phrase “subject to regulation” so that the GHGs emitted by sources that fall below the thresholds or scope established in Steps 1 and 2 are not treated as “subject to regulation,” and therefore do not trigger PSD for the sources that emit them. As discussed in section V.B.3., the term “subject to regulation” is one of four terms that should be considered not to apply literally in the case of GHG sources.

To understand this approach, it is useful to return to the definition of “major stationary source,” which, again, is central to PSD applicability. The definition, quoted previously, employs the term “regulated NSR pollutant,” which is a defined term. The definition incorporates many other elements as well (e.g., the 100/250 threshold requirements), but for convenience, we quote it as follows: A “major stationary source” is “[a]ny * * * source[–] of air pollutants, which emits, or has the potential to emit, [depending on the source category, either] 100 [or 250] tons per year or more of any air pollutant that is subject to regulation under the Clean Air Act.” 40 CFR 51.166(b)(1)(i)(a)–(b). Applying our definition of “subject to regulation” to exclude GHG sources that emit below specified thresholds, the definition may now be paraphrased as follows: A “major stationary source” is any source of air pollutants, which emits, or has the potential to emit, depending on the source category, either 100 or 250 tpy or more of any air pollutant subject to regulation under the CAA, except that the source’s GHGs are considered to be subject to regulation under the CAA only the extent indicated under Steps 1 and 2 of the Tailoring Rule, e.g., for Step 2, only if the source’s GHG emissions exceed the threshold established in Step 2. We adopt the same approach for the

definition of the regulatory term “major modification.”

Although EPA is revising its regulations to apply the phrase subject to regulation in this manner, we have been advised that states may be able to adopt our approach without having to undertake a rulemaking action to revise their state regulations or without requiring an act of the state legislature. Instead, it is our understanding that states may adopt our approach by interpreting the term “subject to regulation” reflected in their regulations to have the same meaning that we are assigning to that term in our regulations in this rulemaking. This is particularly—although not exclusively—the case in a state that has taken the position, or determines now, that the state’s definition of “subject to regulation,” or, more broadly, “regulated NSR pollutant” or “major stationary source” or “major modification,” is intended to be interpreted in a way that tracks the meanings that EPA has assigned to these phrases. Such states can adopt the meaning of “subject to regulation” that we establish in this rule by January 2, 2011, and thereby avoid the situation in which, as a matter of state law, GHG-emitting sources above the 100 or 250 tpy thresholds become subject to PSD by that date. The following explains our basis for concluding that states may apply EPA’s approach under existing regulations that use the term “subject to regulation.” On December 18, 2008, EPA issued the Interpretive Memo, establishing EPA’s interpretation of the definition “regulated NSR pollutant” found at 40 CFR 52.21(b)(50). EPA intended this memorandum to resolve ambiguity in subparagraph (iv) of this definition, which includes “any pollutant that otherwise is subject to regulation under the Act.” Specifically, the memorandum stated that EPA will interpret the definition of “regulated NSR pollutant” to exclude pollutants for which EPA regulations only require monitoring or reporting but to include pollutants subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant.

After reconsidering this interpretation through a formal notice-and-comment process, EPA refined its interpretation to establish that the PSD permitting requirements will not apply to a newly regulated pollutant until a regulatory requirement to control emissions of that pollutant “takes effect.” 75 FR 17704. Importantly, as stated previously, because the term “regulated NSR pollutant” is embedded within the definition of “major stationary source,”

this interpretation effectively defines which major stationary sources are subject to PSD permitting. As a result, for example, EPA explained that PSD and title V permitting requirements for GHGs will not apply to GHGs until at least January 2, 2011, following the anticipated promulgation of EPA regulations requiring control of GHG emissions under title II of the CAA. *Id.*

In the RTC document for EPA’s reconsideration of the PSD interpretative memorandum, we stated that,

Absent a unique requirement of state law, EPA believes that state laws that use the same language that is contained in EPA’s PSD program regulations at 52.21(b)(50) and 51.166(b)(50) are sufficiently open-ended to incorporate greenhouse gases as a regulated NSR pollutant at the appropriate time consistent with EPA’s interpretation of these regulations (emphasis added). (Docket ID No. EPA–HQ–OAR–2009–0597–0128).

Because the state regulations that include EPA’s definition of the term “subject to regulation” in the reconsideration of the Interpretive Memo are “sufficiently open-ended to incorporate greenhouse gases as a regulated pollutant,” those state regulations are also sufficiently open-ended to incorporate the further refinement to the meaning of the phrase “subject to regulation” that we make in this rulemaking.

By the same token, EPA has historically interpreted certain state SIP-approved programs as sufficiently open-ended such that the rules provide for the “automatic assumption for the responsibility for review” of new pollutants before the general deadline for states to revise their PSD programs. *See, e.g.,* 52 FR 24682. Conversely, we have also read federal rules and state rules approved in SIPs to provide for the automatic removal of a pollutant when such pollutant is no longer “subject to regulation.” For example, the 1990 CAA Amendments exempted HAPs listed in section 112(b)(1) from the PSD requirements. *See* CAA section 112(b)(6). Following passage of the amendments, EPA issued “New Source Review (NSR) Program Transitional Guidance,” a memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards to Regional Air Division Directors on March 11, 1991. In that guidance, EPA interpreted its PSD regulations to automatically cease to apply to listed HAPs (with some noted exceptions), and implicitly stated that a state with an open-ended SIP-approved PSD rule could also take the position that its SIP-approved rule automatically ceased to regulate HAPs.

After reviewing these past practices in the PSD permitting program, and EPA’s prior statements regarding pollutants subject to the PSD program, we conclude that states with SIP-approved rules that contain the same language as used in 40 CFR 52.21(b)(50) or 40 CFR 51.166(b)(49), or that otherwise have sufficiently open-ended PSD regulations, would be able to implement our Tailoring Rule approach to permitting by interpreting their regulations, and without needing to promulgate a regulation or seek state legislative action. This is particularly—although not exclusively—the case for states that take the position that they intend their rules to apply in the same manner as EPA’s counterpart rules. If states adopt this reading of their regulations, GHG sources falling below the specified cutoffs would not be emitting pollutants “subject to regulation” within the definition of “regulated NSR pollutant” and therefore would not be subject to PSD permitting as a major stationary source or for making a major modification.

During our consideration of this action, we participated in teleconferences with one local and six state agency permitting authorities to discuss this issue of whether they could implement the proposed rule without the need for state law or regulation changes or a revision of the provisions of state law that are a part of the SIP. We specifically discussed whether defining the phrase “subject to regulation” would better facilitate state incorporation of the limitations in this final rule. The state and local agencies participating in the calls generally agreed that defining the phrase “subject to regulation” would, compared to our proposed approach, better facilitate state incorporation of the limitations in the final rule in states with regulations that mirror the existing federal rules, or in states whose rules are otherwise sufficiently open-ended to incorporate the limitations in the final rule by interpretation. Participants from each agency also indicated that their rules contain the term “subject to regulation” and that term has not been previously interpreted in ways that would preclude application of the meaning assigned to the term by EPA. We therefore concluded it is likely the state rules are sufficiently open-ended to apply EPA’s approach by interpretation (although some states indicated they may elect to pursue rulemaking in addition to or instead of interpretation). Accordingly, we selected the “subject to regulation” regulatory approach as the mechanism for implementing the final rule.

3. Other Mechanisms

As just described, we selected the “subject to regulation” mechanism because it most readily accommodated the needs of states to expeditiously revise—through interpretation or otherwise—their state rules. Even so, it is important to recognize that this mechanism has the same substantive effect as the mechanism we considered in the proposed rule, which was revising numerical thresholds in the definitions of major stationary source and major modification. Most importantly, although we are codifying the “subject to regulation” mechanism, that approach is driven by the needs of the states, and our action in this rulemaking should be interpreted to rely on any of several legal mechanisms to accomplish this result. Thus, our action in this rule should be understood as revising the meaning of several terms in these definitions, including: (1) The numerical thresholds, as we proposed; (2) the term, “any source,” which some commenters identified as the most relevant term for purposes of our proposal; (3) the term, “any air pollutant; or (4) the term, “subject to regulation.” The specific choice of which of these constitutes the nominal mechanism does not have a substantive legal effect because each mechanism involves one or another of the components of the terms “major stationary source”—which embodies the statutory term, “major emitting facility”—and “major modification,” which embodies the statutory term, “modification,” and it is those statutory and regulatory terms that we are defining to exclude the indicated GHG-emitting sources.⁵⁴

4. Codification of Interpretive Memo

As noted previously, we recently affirmed and refined our interpretation of the term “subject to regulation” as it applies broadly to the PSD program through a formal notice and comment process. “Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs,” 75 FR 17004. In the proposal associated with that action, we requested comment on whether we should codify our interpretation in the regulatory text. 74 FR 51535, 51547 (October 7, 2009). We elected not to codify our interpretation in the final action on reconsideration of the Interpretive Memo because we

concluded such an action was not necessary and that it was important to apply the refined interpretation immediately. 75 FR 17015. However, in the RTC document for that action, we indicated that we had not ruled out the option of codifying our interpretation at a later time. Since we are otherwise adopting a definition of “subject to regulation” in this rule as the mechanism for implementing the phase-in, it makes sense in this final rule to codify the interpretation reflected in the Interpretive Memo and the final action on reconsideration at the same time to bring clarity to our rules. Specifically, the definitions of the term “subject to regulation” contain a paragraph that reflects our existing interpretation of that term (*i.e.*, prior to adopting the provisions that implement the phase-in). Codification of the Interpretive Memo in this action makes sense to ensure the regulations reflect a complete picture of the meaning of “subject to regulation” applied by EPA. We also are moving existing exceptions (*e.g.*, section 112 HAPs) to a new paragraph within the definition of “subject to regulation.” This minor reorganization of these regulations is not intended to effect any change in how they are to be implemented, but merely simplifies and clarifies the regulations by clearly delineating different terms and concepts.

This codification of this interpretation of “subject to regulation” from the reconsideration for the Interpretive Memo is not necessary to assure the effectiveness of the interpretation, and it does not disturb states’ existing authority to adopt the definition through interpretation of their existing rules. Codifying our existing interpretation in this action will ensure that parties reading the regulations have a full understanding of how EPA applies the PSD program requirements. Since the interpretation described in the Interpretive Memo and the April 2, 2010 final action are otherwise applicable at this time, the particular time sensitivity discussed in the latter action is not the same for this final action tailoring the PSD requirements.

5. Delaying Limited Approvals and Request for Submission of Information From States Implementing a SIP-Approved PSD Program

Because we now anticipate that many states will be able to implement our tailoring approach through interpretation of the term “subject to regulation,” and without the need to revise their SIPs, we are delaying further action on our proposal to limit our approval of SIPs until we better

understand how permitting authorities will, in fact, implement our tailoring approach. For this purpose, we ask each state to submit a letter to the appropriate EPA Regional Administrator no later than August 2, 2010. In that letter, the state should explain whether it will apply EPA’s meaning of the term “subject to regulation” and if so, whether the state intends to incorporate that meaning of the term through interpretation, and without undertaking a regulatory or legislative process. If a state must undertake a regulatory or legislative process, then the letter should provide an estimate of the time needed to adopt the final rules. If a state chooses not to adopt EPA’s meaning by interpretation, the letter should address whether the state has alternative authority to implement either our tailoring approach or some other approach that is at least as stringent, whether the state intends to use that authority. If the state does not intend to interpret or revise its SIP to adopt the tailoring approach or such other approach, then the letter should address the expected shortfalls in personnel and funding that will arise if the state attempts to carry out PSD permitting for GHG sources under the existing SIP and interpretation.

For any state that is unable or unwilling to adopt the tailoring approach by January 2, 2011, and that otherwise is unable to demonstrate adequate personnel and funding, we will move forward with finalizing our proposal to limit our approval of the existing SIP. Although we received comments questioning our authority to limit approval as proposed, using our general rulemaking and CAA section 110(k)(6) authorities, we are not responding to those comments at this time. We will address these comments in any final action we take to implement a limited approval.

In our proposed rule, we also noted that a handful of EPA-approved SIPs fail to include provisions that would apply PSD to GHG sources at the appropriate time. This is generally because these SIPs specifically list the pollutants subject to the SIP PSD program requirements, and do not include GHGs in that list, rather than include a definition of NSR regulated pollutant that mirrors the federal rule, or because the state otherwise interprets its regulations to limit which pollutants the state may regulate. At proposal, we indicated that we intended to take separate action to identify these SIPs, and to take regulatory action to correct this SIP deficiency.

We ask any state or local permitting agency that does not believe its existing

⁵⁴ We also think that this approach better clarifies our long standing practice of interpreting open-ended SIP regulations to automatically adjust for changes in the regulatory status of an air pollutant, because it appropriately assures that the Tailoring Rule applies to both the definition of “major stationary source” and “regulated NSR pollutant.”

SIP provides authority to issue PSD permits to GHG sources to notify the EPA Regional Administrator by letter, and to do so no later than August 2, 2010. This letter should indicate whether the state intends to undertake rulemaking to revise its rules to apply PSD to the GHG sources that will be covered under the applicability thresholds in this rulemaking, or alternatively, whether the state believes it has adequate authority through other means to issue federally-enforceable PSD permits to GHG sources consistent with this final rule. For any state that lacks the ability to issue PSD permits for GHG sources consistent with this final rule, we intend to undertake a separate action to issue a SIP call, under CAA section 110(k)(5). As appropriate, we may also impose a FIP through 40 CFR 52.21 to ensure that GHG sources will be permitted consistent with this final rule.

6. Title V Programs

Our final action also differs from the proposal in the specific regulatory mechanism by which we tailor the definition of “major source” for title V permit programs, but is a logical outgrowth of our proposed rule. EPA proposed to implement tailoring for GHGs under title V by excluding sources of GHGs from the general definition of “major source” under 40 CFR 70.2 and 71.2, and adding a separate definition of “major source” with tailored thresholds for sources of GHGs. In response to comments, particularly from states concerned with implementation of the proposed approach under state law, EPA is adopting an approach in the final rule that (1) amends the definition of “major source” by codifying EPA’s longstanding interpretation that applicability for a “major stationary source” under CAA sections 501(2)(B) and 302(j) and 40 CFR 70.2 and 71.2 is triggered by sources of pollutants “subject to regulation,” and (2) adds a definition of “subject to regulation.” Further, we are delaying our action to move forward with limiting our previous approval of existing state part 70 programs.

We are finalizing this alternative approach to address concerns similar to those we received with respect to state implementation of SIP-approved PSD programs. Specifically, we received comments that the mechanism we proposed would not address the significant administrative and programmatic considerations associated with permitting GHGs under title V, because the 100 tpy threshold would continue to apply as a matter of state law. Commenters stated that states

would need to undertake a regulatory and/or legislative process to change the threshold in their state laws which they could not complete before the laws would otherwise require issuance of operating permits to GHG sources.

After considering the commenters’ concerns, we are finalizing an approach designed to address the state law concerns for states. As a result, it is unnecessary to move forward at this time with our proposed approach to limit approval of existing part 70 programs in many states.

EPA’s approach involves the interrelationship of terms within the part 70 definition of “major source” in title V and EPA’s implementing regulations, and EPA’s historical practice of interpreting the term “any air pollutant” in the “major stationary source” component of that definition. EPA believes the approach in the final rule will allow many states to adopt the final rule through interpretation of existing state laws. Specifically, paragraph (3) within the definition of “major source” found in 40 CFR 70.2 and 71.2 defines a major source as “a major stationary source of air pollutants, as defined in section 302 of the Act, that directly emits or has the potential to emit, 100 tpy or more of any air pollutant * * *.” The EPA previously articulated the Agency’s interpretation that the regulatory and statutory definitions of “major source” under title V, including the term “any air pollutant,” applies to pollutants “subject to regulation.” Memorandum. EPA recently re-affirmed this position in EPA’s Reconsideration of Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs. 75 FR 17704, 17022–23 (April 2, 2010) (Interpretive Memo reconsideration final action).

Accordingly, under our long-established policy, states historically have interpreted the term “any air pollutant” under the title V definition of “major source” to mean any pollutant “subject to regulation” under the Act. Thus, as a matter of established interpretation, EPA and states effectively read the definition of “major source” under title V to include a source “* * * that directly emits or has the potential to emit, 100 tpy or more of any air pollutant *subject to regulation under the Act*” (emphasis added). By amending our regulations to expressly include and define “subject to regulation” to implement our tailoring for GHGs under title V, we are seeking to enable states to adopt and implement this approach through a continued interpretation of the phrase “any air pollutant” within the “major source”

definition, without the need for changes to state regulations or statutes. States may be able to track EPA’s approach to tailoring for GHG permitting without regulatory or statutory changes, for example, where a state has taken the position, or determines now, that the state’s interpretation of “major source,” “subject to regulation” and/or “any air pollutant” is intended to track EPA’s interpretation.

Thus, EPA is adding the phrase “subject to regulation” to the definition of “major source” under 40 CFR 70.2 and 71.2. EPA is also adding to these regulations a definition of “subject to regulation.” Under the part 70 and part 71 regulatory changes adopted, the term “subject to regulation,” for purposes of the definition of “major source,” has two components. The first component codifies the general approach EPA recently articulated in the “Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting.” 75 FR 17704. Under this first component, a pollutant “subject to regulation” is defined to mean a pollutant subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant and that has taken effect under the CAA. *See id.* at 17022–23; Wegman Memorandum at 4–5. To address tailoring for GHGs, EPA includes a second component of the definition of “subject to regulation,” specifying that GHGs are not subject to regulation for purposes of defining a major source, unless as of July 1, 2011, the emissions of GHGs are from a source emitting or having the potential to emit 100,000 tpy of GHGs on a CO₂e basis.

As explained previously, we find no substantive difference between the alternative mechanisms for implementing GHG tailoring in the final rule. Whether we add GHG thresholds directly to the definition of “major source” (as we proposed), or alternatively, expressly add and define the term “subject to regulation,” both approaches revise the definition of “major source” to implement the Tailoring Rule. Accordingly, we adopt the later approach to facilitate state implementation of the final rule through an interpretation of existing state part 70 programs. Similar to our explanation previously for PSD, while we adopt the “subject to regulation” mechanism for implementing GHG tailoring in the final rule, the thrust of our rulemaking is to apply the title V definition of “major source”—which includes the statutory term, “major stationary source”—to GHG sources by treating only GHG sources

that emit at levels above the Steps 1 and 2 thresholds as meeting that definition. Further, we believe that our action may reasonably be construed to revise any of several terms in that definition, including (1) The numerical thresholds, as we proposed; (2) the term “any air pollutant,” (3) the term “a major stationary source,” (4) the term “subject to regulation,” which, as discussed previously, our regulations graft into the definition of “major source.” We believe that the specific choice of which term constitutes the legal mechanism does not have a substantive legal effect because each mechanism involves one of the components of the regulatory term “major source”—which embodies the meaning of the statutory term, “major source”—and it is that term that we are interpreting to tailor title V applicability for GHG-emitting sources. Thus, while the “subject to regulation” mechanism facilitates expeditious implementation by states, and we are therefore revising our regulations to adopt this approach, we otherwise find no substantive difference between the alternative mechanisms we may use to finalize the proposed rule.

Further, similar to our revised approach for addressing state SIP-approved PSD programs, we are delaying our action to limit our previous approvals for state part 70 operating permit programs. In our proposed rule, we explained our concern that states lack adequate personnel and resources to carry out part 70 operating permit programs for GHG sources that emit or have the potential to emit 100 tpy of GHGs. Accordingly, we proposed to use our general rulemaking authority under section 301(a) of the CAA and APA section 553 to limit our prior approval of state operating permit programs. This limited approval action would have had the effect of applying CAA permitting requirements only to sources that exceed the permitting thresholds established in this rule for the phase-in, because only those sources would be covered by the federally approved part 70 programs. 74 FR 55345. As discussed previously, we are proceeding with a slightly revised approach to address concerns similar to those raised with our proposed approach for addressing SIP-approved PSD permit programs. Because we now recognize that, like the PSD program, many states will be able to implement the final rules without the need to revise their existing part 70 operating permit programs, we are delaying further action on our proposal to limit approval of existing part 70 programs until we better understand

how permitting authorities will implement our final rule.

In addition to the information requested previously on SIP-approved PSD permit programs, we ask each state to submit a letter to the appropriate EPA Regional Administrator no later than August 2, 2010 detailing the state’s plan for permitting of GHG sources under the state’s part 70 program. In that letter, states should explain whether they will adopt an interpretation of the terms “major source” or any of its component terms—“a major stationary source,” “any air pollutant,” or “subject to regulation,” or the numerical thresholds—that is consistent with EPA’s regulatory interpretation of these terms as codified at 40 CFR 70.2, and whether the state intends to adopt the interpretation without undertaking a regulatory or legislative process. This approach may be available, for example, where a state has taken the position, or determines now, that the state’s interpretation of these terms is intended to track EPA’s interpretation, resulting in title V permitting for sources of GHGs as described in EPA’s regulations adopted in this rule. If a state must revise its title V regulations or statutes to implement the interpretation, we ask that it provides an estimate of the time to adopt final rules or statutes in its letter to the Regional Administrator. If a state chooses not to (or cannot) adopt our interpretation, the letter should address whether the state has alternative authority to implement the GHG tailoring approach or some other approach that is at least as stringent, but which also addresses the expected shortfalls in personnel and funding and delays in permitting that would exist if the state carried out permitting under part 70 program thresholds lower than those adopted by EPA in this final rule. For any state that is unable or unwilling to adopt the permitting thresholds in the final rules, and otherwise is unable to demonstrate adequate personnel and funding, EPA will move forward with finalizing a narrowed limited approval of the state’s existing part 70 program. If we do so, then we will respond in that action to comments on our proposal.

In our proposed rule, we also noted that a handful of part 70 operating permit programs may include provisions that would not require operating permits for any source of GHG emissions because, for example, the programs may apply only to pollutants specifically identified in the program provisions, and the provisions do not specifically identify GHGs. In these cases, states may be unable to interpret their regulatory provisions to interpret the term “any pollutant” to include

pollutants “subject to regulation.” We indicated that we intended to take separate action to identify these programs, and to take regulatory action to correct this deficiency. Accordingly, we ask any state or local permitting agency that does not believe its existing part 70 regulations convey authority to issue title V permits to GHG sources consistent with the final rule to notify the EPA Regional Administrator by letter as to whether the state intends to undertake rulemaking to revise its rules consistent with these applicability thresholds. This notification should be done no later than the previously described letter regarding adoption of the Tailoring Rule, and could be combined with similar notifications we request regarding the PSD program. We intend to undertake a separate regulatory action to address part 70 programs that lack the ability to issue operating permits for GHG sources consistent with the final rule. We also intend to use our federal title V authority to ensure that GHG sources will be permitted consistent with the final rule.

D. Rationale for Treatment of GHGs for Title V Permit Fees

The title V program requires permitting authorities to collect fees “sufficient to cover all reasonable (direct and indirect) costs required to develop and administer [title V] programs.”⁵⁵ To meet this requirement, permitting authorities either collect an amount not less than a minimum amount specified in our rules (known as the “presumptive minimum”), or may collect a different amount (usually less than the presumptive minimum). We did not propose to change the title V fee regulations in our notice of proposed rulemaking for this action, nor did we propose to require new fee demonstrations when title V programs begin to address GHGs. However, we did recommend that each state, local or tribal program review its resource needs for GHGs and determine if the existing fee approaches will be adequate. If those approaches will not be adequate, we suggested that states should be proactive in raising fees to cover the direct and indirect costs of the program or develop other alternative approaches to meet the shortfall. We are retaining this proposed approach, and are not changing our fee regulations as part of this final action establishing Steps 1 and 2 of the phase-in. However, we are offering some additional clarification of our fee

⁵⁵ The fee provisions are set forth in CAA section 502(b)(3) and in our regulations at 40 CFR 70.9 and 71.9.

approach during these steps in response to comments we received on this issue. Additional discussion of fees will be included as part of subsequent actions establishing Step 3 and beyond.

A few state commenters suggested that EPA should modify part 70 to adopt a presumptive minimum fee (or range for such fee) for GHGs, some of whom suggested that current fees may be insufficient to cover the costs of their program. It is important to clarify that altering the presumptive minimum would only affect those states that chose to charge the presumptive minimum fee to sources. Most states—including some of the commenters asking EPA to raise the presumptive minimum—collect a lower amount that is not based on the presumptive minimum, but rather, relies on another fee schedule that it developed and EPA approved as adequate to cover costs. Therefore, it is useful to first discuss our approach to programs that have fee schedules resulting in a different amount before discussing our approach to the presumptive minimum.

Because of the added GHG title V permitting workload described elsewhere in this notice, any state that will not, under its current fee structure, collect fees adequate to fund the permitting of GHG sources must alter its fee structure in order to meet the requirement that fees be adequate to cover costs. Changes may not be required in every instance; circumstances will vary from state to state. For example, a state may see increases in revenue from newly-covered sources (based on emissions of pollutants already subject to fees) that fully cover the state's increased costs, or a state may be over-collecting fees now and could use the surplus to offset the increased costs. Nonetheless, in many cases, we think states will need to adjust their fee structures to cover the costs of GHG permitting in order to meet the requirements of the Act and our regulations.

For this reason, although we are not calling for new fee demonstrations at this time, we plan to closely monitor state title V programs during the first two steps of the Tailoring Rule to ensure that the added workload from incorporating GHGs into the permit program does not result in fee shortfalls that imperil operating permit program implementation and enforcement, whatever the basis of the states' fee schedule. As described in the proposal, such fee oversight by EPA may involve fee audits under the authority of 40 CFR 70.9(b)(5) to ensure that adequate fees are collected in the aggregate to cover program costs, with emphasis on

whether the additional GHG workload is being appropriately funded. Also, EPA retains the ability to initiate a program revision under 40 CFR 70.4(i)(3) or issue a notice of deficiency under the process described in 40 CFR 70.10(b) to address fee adequacy issues, which may be uncovered during a fee audit. By relying on existing oversight measures, we are ensuring that the fee requirements are met with a minimum of disruption to existing programs at a time when they will already be facing significant challenges related to GHG permitting.

Turning to the minority of states that do use the presumptive minimum, we did not propose to change the presumptive minimum calculation method to account for GHGs. Currently under the statute and our rules, the presumptive minimum is based on a subset of air pollutants (*i.e.*, VOCs, NAAQS pollutants except for CO, and pollutants regulated under the NSPS and MACT standards promulgated under sections 111 and 112 of the Act, respectively) that does not include GHGs. The amount is specified on a per-ton basis and changes with inflation (it is currently set at \$43.75/ton), but does not apply to emissions over 4,000 tpy of a given pollutant from a given source. We noted several difficulties in applying the presumptive minimum to GHG, including the large amounts of GHG emissions relative to other pollutants and the need for better data to establish a GHG-specific amount. Noting that GHGs are not currently included in the Act's list of pollutants to which the presumptive fee applies, we also invited comment on whether we should raise the fee for listed pollutants to cover the added cost of GHG permitting.

A few state commenters asked us to set a presumptive fee for GHGs, which we take to mean we should add GHGs to the list of pollutants to which a presumptive fee would apply. However, many commenters noted that the current presumptive minimum fee is unreasonable for GHGs because GHGs are emitted in greater quantities than the pollutants currently subject to presumptive fees, which would result in excessive fees. These commenters believe that EPA needs to limit the fees that states can charge for GHGs. Moreover, one commenter read the statute to prohibit us from listing GHGs in the presumptive fee calculation in the first place. Several commenters disagreed with the idea of increasing the presumptive fee for other pollutants to cover the cost of regulating GHGs, some of whom believed that this would unfairly punish existing sources or would bring in no new revenue from

sources triggering title V for the first time.

After considering these comments, we remain disinclined, as we were at proposal, to change the presumptive fee calculation regulations. While there is some support for changing the regulations, the comments confirm the challenges in doing so. While we expressly rejected charging the full presumptive cost per ton amount for GHG, we also did not propose language to establish a different amount just for GHG, to establish whether a different tpy cap would apply, or to assess whether GHGs could even be added to the list. Thus, many commenters were very concerned about whether the full \$43.75 or the 4000 tpy cap would apply to GHG if we listed it as a regulated pollutant for fee purposes. Furthermore, we noted at proposal, and commenters did not disagree, that more data would be needed to establish the appropriate basis for the GHG presumptive minimum. We are not taking a final position in this notice on whether the statute is amenable to including GHG in the presumptive fee calculation currently, but these comments illustrate some of the difficulties of such an approach.

At the same time, we are not increasing the presumptive minimum for other pollutants already included in the fee calculation. We disagree with the commenter who said such an approach would bring in no new revenue from newly-subject sources. Many of the newly-subject sources would emit already-included pollutants. If new revenue from these pollutants were insufficient, and because the Act does not specify how the shortfall must be addressed, the amount of any projected shortfall could be made up by increasing fees on these pollutants. In fact, the projected shortfall could be addressed without having to inventory GHG emissions from title V sources, since the emissions of already-included pollutants are well-known. We also note that, although some commenters are concerned that failing to assess fees for GHGs directly would be unfair, the statute does not provide that the presumptive fee be proportional to each type of pollutant or be proportionally allocated to all sources. Rather, the presumptive fee approach provides a backstop for states that do not wish to adopt a more tailored approach. Nonetheless, we have decided not to increase the presumptive fee amounts for other pollutants because we lack information about the extent to which shortfalls exist due to GHG permitting, and which mix of sources and fees is appropriate for addressing any such

shortfall in a state. This decision also provides greater flexibility to states and minimizes disruption to existing programs.

We note that, contrary to the statements of some commenters, the CAA provisions allowing for a presumptive fee calculation do not override the basic requirement that fees be adequate to cover costs. As noted previously, we expect states to see a revenue increase from emissions of listed pollutants at newly-major sources for GHGs, and it is also possible that the presumptive minimum may currently be resulting in over-collection of fees in a state. Thus, a state continuing to use the presumptive minimum may not have a shortfall. However, if states using the presumptive minimum approach do have a revenue shortfall due to GHG permitting, the statute requires the shortfall to be addressed. The EPA has had, and will continue to have, the ability to require states that use the presumptive minimum to increase their fees if the presumptive minimum results in a revenue shortfall that imperils operating permit program implementation and enforcement. Thus, although we are not changing the presumptive minimum in our regulations, we plan to follow the same oversight approach for states using the presumptive minimum as for those collecting less based on a resource demonstration. As described previously, this approach may involve fee audits with emphasis on whether the additional GHG workload is being appropriately funded, and other appropriate follow-up.

Consistent with our proposal, EPA is not modifying its own part 71 fee structure (which closely mirrors the presumptive minimum) in order to charge an additional fee for GHGs. EPA must revise its fee schedule if the schedule does not reflect the costs of program administration. We have not determined that the existing fee structure will be inadequate to fund the part 71 programs costs during the first two phases of permitting GHGs as set forth in this action. However, we are required to review the fee schedule every 2 years, and make changes to the fee schedule as necessary to reflect permit program costs. 40 CFR 71.9(n)(2). Thus we will continue to examine the increases in part 71 burden due to GHG permitting, the current revenue collection, and the increases in revenue from newly-subject part 71 sources, and will adjust the part 71 fee approach accordingly.

Finally, several state and industry commenters asked EPA to provide guidance and recommendations for an

appropriate GHG fee structure. We note that title V grants permitting authorities considerable discretion in charging fees to sources for title V purposes and does not require or prohibit fees specifically for GHGs, provided the states collect fees in the aggregate that are sufficient to cover all the direct and indirect program costs. In responding to requests for guidance, we do not wish to limit state discretion. For example, some commenters suggest that EPA prohibit emissions-based fees for GHGs or cap the amount that can be collected, while others suggest we provide a range of acceptable fees. We are concerned that, given the wide variety of fee approaches that states now take, providing specific guidance may be disruptive, rather than helpful, to states.

On the other hand, we recognize that it will initially be difficult for states to establish an appropriate emissions fee for GHGs. As noted previously, there are currently limited data available for establishing such a fee, and, due to the large quantities of GHG emissions, such a fee may only amount to a few cents per ton. At the same time, as noted in the proposal, a number similar to that used for other pollutants (*e.g.*, the presumptive minimum of approximately \$45/ton of GHG) would be inappropriate because it would likely result in huge over-collection. Because of this challenge, we note that 40 CFR 70.9(b)(3) allows the state to charge fees to individual sources on any basis (*e.g.*, emission fee, application fee, service-based fees, or others, in any combination). While most states use emissions-based fees, there is merit to considering all the available fee bases to address increased GHG workload, including approaches that do not require a GHG emissions inventory for fee purposes. For example, where it is possible to estimate a revenue shortfall as a percentage of fee revenue, it may be appropriate to simply attach a percentage-based surcharge to each source's fee to match that shortfall. Similarly, where the shortfall could be estimated as a total dollar amount, a flat surcharge could be added to each source's fee to address the shortfall.

These suggestions should not be read to indicate that EPA prefers any particular approach, or that EPA rejects a cost per ton approach. Rather, they illustrate that it is possible to address a revenue shortfall without establishing a GHG per-ton fee. While the EPA is declining to recommend specific approaches in this preamble, we are committed to assisting states in implementing the fee requirements for GHG. Therefore, we will work with any

state that requests assistance from EPA in developing a workable fee approach.

E. Other Actions and Issues

1. Permit Streamlining Techniques

In our proposal, we stated that while we were phasing-in permitting requirements, we would make a concerted effort to assess and implement streamlining options, tools, and guidance to reduce the costs to sources and permitting authorities of GHG permitting. We recognized that the development and implementation of these techniques should be an integral part of our strategy during the phase-in period, and we stated that we would undertake as many streamlining actions as possible, as quickly as possible. We discussed several streamlining techniques in particular, including: (1) Defining PTE for various source categories, (2) establishing emission limits for various source categories that constitute presumptive BACT, (3) establishing procedures for use of general permits and permits-by-rule, (4) establishing procedures for electronic permitting, and (5) establishing "lean" techniques for permit process improvements. The first three of these approaches have the potential to have the greatest impact in reducing the numbers of sources subject to PSD or title V (the definition of PTE) or of reducing permitting costs (presumptive BACT and general permits or permits-by-rule).

In our proposal, we also described the timing for development and implementation of these streamlining techniques. We explained that each of the first three techniques would generally take 3–4 years to develop and implement, and therefore would be of limited use in the near-term. This time frame is necessary because EPA will first need to collect and analyze small source data that we do not currently have—because these are sources that EPA has not traditionally regulated—in order to assess which of these techniques are viable or effective for such sources. In general, EPA will then need to conduct notice-and-comment rulemaking to establish the approaches, and that rulemaking will need to address various legal and policy aspects of these approaches. After that, the permitting authorities will need some time to adopt the streamlining techniques as part of their permitting programs.

We received several comments on streamlining techniques. In general, the comments indicate widespread support for our pursuit of streamlining approaches, but some commenters were

concerned that one or more of EPA's identified streamlining options were complex, vague, ineffective, and questionable legally. Noting our proposal to phase in permitting, in part to allow more time to develop streamlining options for smaller sources, some commenters suggested that we should delay permitting for larger sources for the same reasons. We disagree. Such a delay is not justified under our legal basis for this rule. While implementation of Steps 1 and 2—which will cover larger sources—will pose implementation challenges, and some of the streamlining tools could assist with meeting these challenges, we have assessed the burdens associated with GHG permitting and have established a phase-in schedule that represents a manageable workload, even in the absence of streamlining techniques. On the other hand, we do agree with these commenters that, absent streamlining, applying PSD and title V requirements to the much larger number of small sources would lead to absurd results and administrative impossibility. The sources for whom the phase-in delays applicability are precisely the sources that have the greatest need for streamlining measures, and thus the greatest need for a deferral while we develop and implement streamlining options.

In addition, commenters generally echoed many of our concerns about why it will take time to put these measures in place, and no commenter presented any information to suggest that our 3–4 year estimate for the PTE, presumptive BACT, and general permit measures was invalid.

For these three techniques, we continue to believe that as we noted at proposal, we will require collection of significant category-specific data for source and emission unit types that have heretofore generally not been regulated by the CAA (e.g., furnaces, water heaters, etc.), which could take up to 1 year. Moreover, commenters had differences of opinion as to whether and how we should move forward on these approaches, and some raised policy and legal issues that we would likely want to explore through a notice and comment process in order to assess which of these measures are viable to pursue further.⁵⁶ Even if a rulemaking

were done expeditiously, it would likely require 1 year. Finally, unlike lean and electronic permitting, these approaches, once finalized by EPA, will likely require additional time of up to 2 years for states to adopt. Thus, it is clear that these approaches will not be in place in time to ease any burden prior to the planned rulemaking for Step 3.

Some commenters did observe that the fourth and fifth techniques, lean and electronic permitting, could, at least theoretically, become available sooner. However, these commenters also noted that successful design and implementation of these approaches will require implementation experience with GHG permitting that is not now available. We expect that for the lean and electronic permitting techniques, at least 1 year of implementation experience (of the type that we will gain starting in 2011) would be required, plus at least an additional year to extrapolate that experience to small sources and put these approaches into effect for small source permitting. Thus, we do not think the lean and electronic permitting would be in place before the beginning of 2013. Moreover, a handful of commenters questioned whether lean and/or electronic permitting would alleviate significant burden. Thus we are not able, at this time, to presume that these approaches will ease any burden prior to the planned rulemaking for Step 3.

It is also important to note that, as a practical matter, while these efforts to streamline the program for small sources are underway, EPA and states will also be devoting a significant amount of their permitting resources and expertise to implementing the PSD and title V programs for the GHG-emitting sources covered under Steps 1 and 2. We have established these steps in a manner that they will be feasible for EPA and state/local/tribal authorities, but even so, they will not only consume current permitting authority resources, but they will also require substantial additional resources. As a result, the efforts to develop and implement streamlining techniques will have to compete with the work necessary to administer existing programs. For example, during the remainder of 2010, as described elsewhere in this notice, EPA permitting program resources will, in addition to continuing to administer programs for non-GHG pollutants, be used to conduct *at least* the following GHG-related activities in addition to streamlining: (1) Develop BACT and other information and guidance for implementing programs for sources covered by Step 1, followed by additional guidance and information for

sources covered by Step 2; (2) review and act on information we receive regarding state adoption of GHG permitting requirements, which may entail narrowing of previous SIP approvals or processing of other programmatic revisions; and (3) propose and finalize measures to address programs with deficiencies in GHG coverage. As the beginning of Step 2 nears, we will also begin to receive and process the first applications for permits that will incorporate GHG requirements (*i.e.*, those that will be issued after January 2, 2011). States seeking to implement streamlining approaches will face similar competition for permitting resources.

These time frames and resource considerations for streamlining confirm the approach to phase-in that we are taking in this rule. First and foremost, they make clear that it will not be possible to have streamlining measures in place in time for either Step 1 or Step 2. Therefore our selection of threshold for those steps is not built on assumptions that streamlining will remove some or all of the burden during those steps.

Second, they make clear that, while no significant streamlining can be in place by the time we must begin to develop the Step 3 rule (*i.e.*, latter half of 2011, to promulgate by July 2012, effective July 2013), it is likely that by that time EPA and states will have had an opportunity to gain implementation experience that could serve as the basis for beginning to implement streamlining techniques that do not require rulemaking or state adoption (*e.g.*, lean and electronic permitting). It is also likely that we will have had an opportunity to gather technical information—which we have already begun to gather—for certain source and emissions unit categories that would be necessary to support proposal of PTE or presumptive BACT approaches for those categories. We expect that the Step 3 rulemaking will provide an opportunity for us to use that experience and data to begin to propose streamlining approaches that need notice and comment rulemaking. We can also begin to take into account any burden reductions from possible early streamlining efforts—that is, through lean and electronic permitting—in the establishment of Step 3.

Third, it is clear that the potential availability of streamlining measures does not call into question our decision that in no event will we broaden PSD and title V applicability to cover GHG-emitting sources below the 50,000 tpy CO₂e level prior to July 2016, as discussed elsewhere. EPA cannot now

⁵⁶ We do not attempt to address or resolve the various opinions about what legal or policy direction we must take regarding any of these streamlining options. The proper forum for doing that will be in the action(s) where we apply a given option. Nonetheless, our RTC document provides additional detail about the options we described and what commenters said about our proposed options. In addition, the comments themselves can be accessed in the docket for this action.

predict the resources that will be required to implement PSD and title V programs for GHG-emitting sources once various streamlining techniques are ultimately completed. This is uncertain not only because we need data and implementation experience with GHG permitting during Steps 1, 2, and 3 that we can apply to estimates for small sources, but also because, as comments indicate, there is a broad range of legal and policy issues to consider in crafting the streamlining approaches we ultimately adopt. We have presented an initial assessment of options and obtained views of commenters both supporting and opposing them, and it is the result of these future actions, whose outcomes are uncertain at this time, that will ultimately determine the extent to which streamlining approaches will allow for the administration of PSD and title V programs for numerous small sources. Thus, while we are optimistic that we can craft workable, common-sense solutions, we nonetheless, believe it is important to preserve our small source exclusion until we have not only had time to put the streamlining approaches in place, but also have had time to assess the burdens that remain, before we bring in additional sources below the 50,000 tpy CO₂e levels. We believe that the 6-year timeframe will require a sustained intensive effort by EPA and states to develop, adopt, and implement streamlining techniques, and will require EPA to then evaluate those techniques and complete a rulemaking concerning PSD and title V applicability to small-sources based on that evaluation. In this manner, the 6-year period will give us the necessary time to make the best decisions about the actions we should take beyond Step 3.

While comments make clear that there are issues to be addressed, nothing in the comments has persuaded us that we should abandon our streamlining efforts. To the contrary, the strong support for these efforts shown by many commenters reinforces our intention, as stated at proposal, to move forward with these approaches as an integral part of our phase-in approach. Moreover, notwithstanding the competition for GHG permitting resources and expertise, we believe it is critical that we move forward expeditiously. As noted previously, we are already taking a first step by initiating permitting for larger sources, beginning January 2011, that will begin to provide valuable implementation experience. This experience can be useful in allowing states to begin implementing early streamlining measures, like lean and electronic permitting, which do not

require EPA action. We have also already begun, and will continue, developing data necessary to support possible rulemakings addressing approaches such as PTE, presumptive BACT, and/or general permits. We expect to be able to use these data to support possible rulemakings on these topics, as appropriate, at about the same time as our Step 3 rulemaking. There may also be available streamlining options that were not described in our proposal that warrant further consideration. Because of the uncertainty surrounding such approaches, we are not committing to finalize rules on any particular approach, but we do plan to explore all streamlining options as expeditiously as possible, beginning immediately and proceeding throughout the phase-in period, and we encourage permitting authorities to do the same. We commit to consider a wide array of possible streamlining measures, and we commit to propose and take comment on, in the Step 3 rulemaking, a set of those measures that we determine are viable to pursue further.

2. Guidance for BACT Determinations

The CAA requires that a PSD permit contain, among other things, emissions limits based on the BACT for each pollutant subject to regulation under the Act emitted from the source that triggers PSD. 42 U.S.C. 7475(a)(4); 42 U.S.C. 7479(3). BACT is defined as follows:

(3) The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to section 111 or 112 of this Act. Emissions from any source utilizing clean fuels, or any other means, to comply with this paragraph shall not be allowed to increase above levels that would have been required under this paragraph as it existed prior to enactment of the Clean Air Act Amendments of 1990.

42 U.S.C. 7479(3).

Thus, the BACT process is designed to determine the most effective control strategies achievable in each instance, considering energy, environmental, and

economic impacts. However, the case-by-case nature of BACT, together with the range of factors and technologies that must be considered, presents a challenge in determining BACT for newly regulated pollutants. When a new pollutant is regulated, the first permit applicants and permitting authorities that are faced with determining BACT for a new pollutant will likely need to invest more time and resources in gathering and analyzing information necessary to make an assessment of BACT under the statutory criteria. Once the PSD permitting program matures with respect to the new pollutant, successive BACT analyses will establish precedents that can inform subsequent BACT determinations. While the BACT provisions clearly contemplate that the permitting authority evaluate control strategies on a case-by-case basis, EPA recognizes the need to develop and share policy guidance and technical information for sources and permitting authorities as they begin to permit sources of newly regulated pollutants, such as GHGs. When applied in a practical manner, this additional EPA guidance and technical information should reduce time and resource needs when evaluating BACT for newly regulated pollutants.

As described in the proposed Tailoring Rule, EPA intends to compile and make available technical and background information on GHG emission factors, control technologies and measures, and measurement and monitoring methodologies for key GHG source categories. We expressed our intent to work closely with stakeholders in developing this supporting information and to ensure this information is available in sufficient time to assist permitting agencies in their BACT determinations. The proposal took comment on what other types of support or assistance EPA can provide to initially help air pollution control agencies with the permitting of GHGs.

Commenters on the proposed Tailoring Rule generally supported EPA providing technical information and policy guidance for sources of GHGs. Several commenters specifically requested guidance to clarify GHG-related issues, such as how to compute CO₂e emissions, how to evaluate emissions of CO₂ from biomass fuel, and whether an air quality analysis will be required for GHGs. Additionally, commenters requested that EPA issue "white papers" and other tools that would provide information on a range of control technologies and measures for major stationary source categories, such as power plants, cement kilns, glass

furnaces, and other sources. Many of these commenters further requested that EPA provide an opportunity for stakeholder input on the guidance, and a few commenters insisted that permitting for sources of GHGs should not begin prior to issuing final guidance.

Consistent with our commitment at proposal to involve all stakeholders in our guidance development, EPA called upon the CAAAC in September 2009, to provide assistance and recommendations for what types of guidance and technical information would be helpful.⁵⁷ Specifically, our charge to the CAAAC was “* * * to discuss and identify the major issues and potential barriers to implementing the PSD Program under the CAA for greenhouse gases * * * [and] focus initially on the BACT requirement, including information and guidance that would be useful for EPA to provide concerning the technical, economic, and environmental performance characteristics of potential BACT options.” This charge also requested the CAAAC to “identify and discuss approaches to enable state and local permitting authorities to apply the BACT criteria in a consistent, practical and efficient manner.”

At its October 6, 2009 meeting, the CAAAC established a Climate Change Work Group, made up of 35 representatives from a variety of industries, state and local governments, and environmental and public health non-profit organizations, organized under CAAAC's Permits, New Source Review and Toxics Subcommittee. The Work Group initially focused its attention on the procedure for evaluating BACT and decided that the process and criteria for determining BACT for criteria pollutants represented a workable and acceptable framework for GHGs. The Work Group also recommended a second phase, in which the Work Group would consider member proposals regarding possible alternative or supplementary approaches to applying the PSD program to GHG sources.

In February 2010, the CAAAC completed work on the first phase of its effort and sent EPA a list of recommendations that highlighted areas of the BACT determination process that are in need of technical and policy guidance. For more information, see the Interim Phase I Report on Issues related to BACT for GHGs, February 3, 2010 that is located in the public docket for this rulemaking and at http://www.epa.gov/air/caaac/climate/2010_02_InterimPhaseIReport.pdf. In response, we are working on a number of fronts to develop technical information, guidance, and training to assist states in permitting large stationary sources of GHGs, including identifying GHG control measures for different industries. EPA is currently working with states on technical information and data needs related to BACT determinations for GHGs. This includes developing the EPA Office of Research and Development GHG Mitigation Strategies Database, enhancing the RACT/BACT/LAER Clearinghouse to include GHG-specific fields, and preparing technical information on sector-based GHG control measures. Also, EPA is actively developing BACT policy guidance for GHGs that will undergo notice and comment and will culminate in training courses for state, local, and tribal permitting authorities. The results of all of these efforts will roll out over the remainder of 2010. EPA currently awaits the Work Group's recommendations from its second phase of deliberations, which is underway as of the date of this notice.

EPA does not agree with some commenters' suggestion that EPA should delay permitting of any sources until final BACT guidance is issued. As discussed in the final action on reconsideration of the Interpretive Memo, delaying the application of BACT to enable the development of guidance or control strategies is not consistent with the BACT requirements. 63 FR 17008. Furthermore, as just described, EPA expects such a delay to be unnecessary because EPA will soon begin providing technical information to inform BACT decisions, and will continue to provide additional guidance prior to the date that GHG permitting begins. However, even in the absence of such guidance, a delay would not be justified under the legal doctrines of “absurd results” and “administrative necessity.” While implementation of the BACT requirement during Steps 1 and 2 will pose implementation challenges, EPA has assessed the burden associated with GHG permitting with consideration

given to these challenges, and has established a phase-in schedule that represents a manageable workload.

Thus, while BACT will remain a case-by-case assessment, as it always has been under the PSD program, EPA is confident that this guidance development effort will help support a smooth transition to permitting emissions of GHGs. Furthermore, EPA will continue to work to provide the most updated information and support tools to allow permitting authorities to share and access the most updated information on GHG BACT determinations as they are made once permitting of GHGs begins. EPA remains committed to involving stakeholders in the upcoming efforts to develop guidance to help permitting authorities in making BACT determinations for sources of GHGs.

3. Requests for Higher Category-Specific Thresholds or Exemptions From Applicability

Although we did not propose any categorical exemptions, many commenters requested exemptions from major source and major modification applicability determinations under title V and PSD for certain types of GHG-emitting sources or certain types of GHG emissions as follows:

Source Categories. Many commenters requested various exemptions or exclusions from source applicability for GHGs under both PSD and title V permitting, either during the phase-in period or permanently, citing anticipated burdens, societal costs, and differences in emission characteristics. Commenters representing non-traditional sources or source categories (sources that have not historically been required to get permits) requested exemptions from permitting based on GHG emissions, including agricultural sources, residential sources, and small businesses. In general, these commenters sometimes, but not always, cited “absurd results” and “administrative necessity” arguments in their exemption requests.

Several commenters from sectors that consume a great deal of energy in their industrial processes and that are subject to international competitiveness, such as aluminum, steel, cement, glass, pulp and paper, and other manufacturers, requested that they be exempt from permitting under this final rule. These commenters state that we have not carefully considered the environmental and economic consequences of this action because if we had, we would have exempted them for several reasons, including (1) other countries typically exempt similar sources from GHG cap

⁵⁷ The CAAAC is a senior-level policy committee established in 1990 to advise the U.S. EPA on issues related to implementing the CAA Amendments of 1990. The committee is chartered under the Federal Advisory Committee Act and has been renewed every 2 years since its creation. The membership is approximately 40 members and experts representing state and local government, environmental and public interest groups, academic institutions, unions, trade associations, utilities, industry, and other experts. The CAAAC meets three times a year, normally in Washington, DC. It provides advice and counsel to EPA on a variety of important air quality policy issues. The committee has formed several subcommittees to provide more detailed discussion and advice on many technical issues.

and trade programs because the industries are making significant energy efficiency improvements even in the absence of GHG regulation, and (2) permitting such sources may cause many facilities to move to countries that have less regulation or no regulation for GHGs.

Other industry groups cited unique characteristics of their emissions, or the quantities in which they are emitted, that they argued should justify exclusion or unique thresholds. Semiconductor production facilities asked for exemptions, arguing that combustion-related GHG emissions are different from their GHG emissions, which result from the use of high-GWP industrial gases, such as PFCs, with higher GWP values that are more likely to trigger permitting requirements at relatively low tpy values. One lime production commenter stated that EPA could encourage energy efficiency projects at its plants by excluding calcination and other process emissions, arguing that these emissions are a relatively small portion of the national inventory that will have no material effect on air quality and global warming. Another commenter requested that EPA exclude emissions from poultry production (natural bird respiration) from permitting consideration because the IPCC excludes them from its GHG emission estimates. Representatives of the landfill industry pointed to the relationship between current statutory thresholds that apply to their regulated emissions, primarily NMOC, and the equivalent amount of GHG emissions this corresponds to. They argued for a source-category specific threshold that is at least equivalent to their current NMOC threshold, or roughly 750,000 tpy CO₂e according to their estimate.

Although the proposal for the Tailoring Rule generally addressed how the statutory requirements for major source applicability (100/250 tpy thresholds) could be phased in in ways that would offer relief to traditional and non-traditional sources, such as residences, farms, small business, and semiconductor manufacturers, it did so by establishing relatively high CO₂e thresholds during the early implementation period and lowering the thresholds over time as streamlining mechanisms become available to reduce administrative burdens. We did not propose any permanent exemptions of any kind or temporary exemptions based on source category. Also, note that the proposal discussed energy efficiency, process efficiency improvements, recovery and beneficial use of process gases, and certain raw material and product changes in the

context of short-term, low-cost means of achieving GHG emission reductions for small-scale stationary sources, but not in the context of exemptions.

As discussed previously, we are still considering whether permanent exemptions from the statute are justified for GHG permitting based on the “absurd results” legal doctrine. We do not have a sufficient basis to take final action at this time to promulgate any of the suggested exclusions on the grounds, described previously, suggested by the commenters. We note, however, that nothing in this rule forecloses the opportunities we may have to explore such options in the future. Therefore, we are taking no action in this rule on these various commenters’ requests for exclusions.

Some commenters also recommended that we create exclusions for their particular source categories for the specific purpose of avoiding overwhelming permitting burdens. We did solicit comment on alternative approaches to burden relief in the proposal. Some commenters suggested that the “administrative necessity” or “absurd results” rationale, each of which would be based on extraordinary administrative burdens, could be used to create at least temporary exclusions that would allow more sources to escape permitting than what we proposed. However, commenters have not, to date, provided specific information about the costs and administrative burdens associated with permitting their source categories.

Regarding the specific concerns about the need for a small business exclusion, we note that the Office of Advocacy of the SBA made several recommendations on the proposal to address concerns about large numbers of small businesses becoming subject to the permit programs. For example they recommended that EPA adopt major source thresholds of 100,000 tpy and major modification thresholds of 50,000 tpy CO₂e. They also recommended that we adopt an interpretation of the effective date of the LDVR to provide additional time to prepare. We took action consistent with the latter recommendation in the Interpretive Memo, and we are taking action consistent with the former recommendation in this rule (although the threshold for modifications we are adopting is higher, for reasons explained previously). We are finalizing Steps 1 and 2 using the threshold-based approach, which applies the various legal doctrines, in the context of the *Chevron* framework, in a way that effectively exempts all small sources during this part of the phase-in, while

assuring the administrability of the permitting programs for the sources that remain subject to them. We anticipate that virtually all small businesses not already subject to PSD and title V would be excluded under this approach. Similarly, with respect to high GWP gases as discussed previously, we are maintaining the statutory mass-based threshold, and this should address commenters’ concerns regarding the inclusion of those gases. Therefore, we reiterate that we are not finalizing any such exclusions in this rule and, as noted above, we are not taking final action in the commenters’ requests for exclusions.

Concerning the comment that we did not take appropriate economic and environmental considerations into account for this rulemaking action, we disagree. The approach we finalize in this notice for Steps 1 and 2 minimizes economic burdens by limiting permitting to the largest GHG emission sources. We further note that the PSD program as applied to the sources that are covered in Steps 1 and 2 contains an express requirement to take energy, environmental, and economic considerations into account when making control technology (*i.e.*, BACT) decisions and accordingly many of the concerns about control costs will be able to be accounted for in that analysis.

Biomass Combustion/Biogenic Emissions. Several commenters request that EPA exempt emissions from biogenic activities or biomass combustion or oxidation activities, including solid waste landfills, waste-to-energy projects, fermentation processes, combustion of renewable fuels, ethanol manufacturing, biodiesel production, and other alternative energy production that uses biomass feedstocks (*e.g.*, crops or trees). For example, commenters urged that EPA exclude emissions from biomass combustion in determining the applicability of PSD to GHGs based on the notion that such combustion is “carbon neutral” (*i.e.*, that combustion or oxidation of such materials would cause no net increase in GHG emissions on a lifecycle basis). Some commenters oppose the exemption of biogenic/biomass activities, claiming the lack of a valid scientific basis for treating these GHG emissions differently than other GHG emissions and expressing concern that we should not assume all biomass combustion is carbon neutral.

The proposed Tailoring Rule did not address this issue of exemptions for biomass combustion or biogenic emissions. We are mindful of the role that biomass or biogenic fuels and feedstocks could play in reducing

anthropogenic GHG emissions, and we do not dispute the commenters' observations that many state, federal, and international rules and policies treat biogenic and fossil sources of CO₂ emissions differently. We note that EPA's technical support document for the endangerment finding final rule (Docket ID No. EPA-HQ-OAR-2009-0472-11292) states that "carbon dioxide has a very different life cycle compared to the other GHGs, which have well-defined lifetimes. Instead, unlike the other gases, CO₂ is not destroyed by chemical, photolytic, or other reaction mechanisms, but rather the carbon in CO₂ cycles between different reservoirs in the atmosphere, ocean, land vegetation, soils, and sediments. There are large exchanges between these reservoirs, which are approximately balanced such that the net source or sink is near zero."

Nevertheless, we have determined that our application of the "absurd results," "administrative necessity," and one-step-at-a-time legal rationales that support this rule, which are based on the overwhelming permitting burdens described previously, does not provide sufficient basis to exclude emissions of CO₂ from biogenic sources in determining permitting applicability provisions at this time. This is because such an exclusion alone, while reducing burdens for some sources, would not address the overwhelming permitting burdens described above, and a threshold-based approach would still be needed. As noted above, we have not examined burdens with respect to specific categories and thus we have not analyzed the administrative burden of permitting projects that specifically involve biogenic CO₂ emissions taking account of the threshold-based approach, nor did the commenters provide information to demonstrate that an overwhelming permitting burden would still exist, justifying a temporary exclusion for biomass sources.

At the same time, the decision not to provide this type of an exclusion at this time does not foreclose EPA's ability to either (1) provide this type of an exclusion at a later time when we have additional information about overwhelming permitting burdens due to biomass sources, or (2) provide another type of exclusion or other treatment based on some other rationale. Although we do not take a final position here, we believe that some commenters' observations about a different treatment of biomass combustion warrant further exploration as a possible rationale. Therefore, although we did not propose any sort of permanent exclusion from PSD or title V applicability based on

lifecycle considerations of biogenic CO₂, we plan to seek further comment on how we might address emissions of biogenic carbon dioxide under the PSD and title V programs through a future action, such as a separate Advance Notice of Proposed Rulemaking (ANPR). This action would seek comment on how to address biogenic carbon under PSD and title V, the legal and policy issues raised by options regarding implementation. We will provide an opportunity for public comment before adopting any final approach.

We further note that, while we are not promulgating an applicability exclusion for biogenic emissions and biomass fuels or feedstocks, there is flexibility to apply the existing regulations and policies regarding BACT in ways that take into account their lifecycle effects on GHG concentrations. This topic has already been explored by the CAAAC workgroup on BACT issues related to GHGs that recently provided recommendations to EPA. These recommendations are located in the public docket for this rulemaking and at http://www.epa.gov/air/caaac/climate/2010_02_InterimPhaseReport.pdf. While that group was unable to come to a consensus on how biomass-based emissions should be treated, it provided us with information that we will consider as we issue guidance on BACT. As previously discussed, we plan to issue BACT guidance later this year, but are not doing so as part of this rulemaking. Without prejudging the outcome of our process to seek comment whether and how we might address emissions of biogenic carbon under the PSD and title V programs through a future action, this issue warrants further exploration in the BACT context as well, and we plan to fully explore it and take action if appropriate.

Fugitive Emissions. Numerous commenters believe that fugitive GHG emissions should be excluded from major source determinations, citing difficulties in measuring or estimating such emissions. Others believe EPA did not address fugitive emissions in the proposal and they ask for clarification of the treatment of fugitive GHGs in applicability determinations under PSD and title V. Some of these commenters state that EPA has not undertaken a rulemaking under CAA section 302(j) for any source category of fugitive GHGs, so they should not be included. Several commenters representing the solid waste disposal industry requested exemptions for fugitive emissions for landfills and waste-to-energy projects, pointing out that current practice under PSD is for fugitive emissions from

certain landfills to not be counted toward major source determinations.

In the proposal, EPA did not offer any specific guidance or discuss exemptions for fugitive emissions of GHGs. Commenters did not suggest that a fugitive exemption would address the overwhelming permitting burdens described previously, or that it was necessary to specifically tailor GHG applicability through the use of a fugitive emissions exclusion for categories that would otherwise be required to include them.

We do agree with commenters who stated that we should clarify how to count fugitives in determining applicability under this rule. In response, we note that we are not taking final action with respect to commenters' request, and we are not finalizing any special rules for fugitive emissions related to GHG. Thus, EPA's rules related to the treatment of fugitives would apply. Regarding the comment that a CAA section 302(j) rulemaking is required before fugitive emissions may be counted, we disagree. As we read section 302(j), once EPA has established by rule that fugitive emissions are to be counted for a specific source category, nothing in section 302(j) requires EPA to conduct new rulemaking to allow for the counting of additional pollutants from that category. We read section 302(j) as imposing an obligation to determine if fugitive emission generally should be counted from a source or source category and not requiring that EPA list both source categories and relevant pollutants. Indeed, our practice in listing categories has not been to limit the pollutants to which the listing applies. Therefore, we are applying our existing rules and policies for fugitive emissions for GHG as we would any other pollutant.

Pollution Control Projects. Other commenters request exemptions for pollution control projects from PSD major modification requirements, particularly projects that increase the efficiency or thermal performance of a unit or facility, resulting in emission reductions on a pounds/megawatt-hour or production basis. The current PSD rules do not exclude pollution control projects from being considered a physical change or change in the method of operation that would—if it resulted in a significant net emissions increase—constitute a major modification, and the case law makes clear that we could adopt a permanent exclusion in the future.⁵⁸ To the extent

⁵⁸ On June 24, 2005, the United States Court of Appeals for the District of Columbia Circuit vacated

that the commenters seek an exclusion for pollution control projects that relies solely on “absurd results” or “administrative necessity” for reasons similar to those described previously for other requested exclusions, we take no action on this request in this rulemaking.

4. Transitional Issues Including Requests for Grandfathering

In the Tailoring Rule proposal, we did not discuss or specifically ask for comment on any provisions to address the transition from a permitting regime that does not incorporate GHGs to one that does, such as “grandfathering” provisions or similar approaches that would exempt previously issued permits or pending applications from having to incorporate requirements for GHGs. We nonetheless received several public comments that addressed a variety of transitional issues. One group of comments addresses situations prior to permit issuance where a PSD or title V application is either administratively complete or more generally being processed prior to the trigger date for GHG permitting (“in process” applications). Another group of comments addresses situations where a PSD or title V permit is issued prior to the GHG trigger date and the commenters request that the application and/or permit be exempt from any requirements for updates related to GHGs after permit issuance.

With respect to PSD, many commenters requested that we adopt a “grandfathering” approach to applicability to exempt projects that have administratively complete PSD or minor NSR permit applications pending when the GHG permitting requirements go into effect. Several commenters urged us to promulgate transition provisions (without specifically using the term “grandfathering”), pointing out that we have provided transition periods for revising pending PSD permits, in the past, when new PSD rules were issued (e.g., in late 1970s and 1980). These commenters assert that GHG requirements will cause more disruption than those previous rule changes. Several commenters asked that PSD applications be evaluated on the basis of the PSD requirements effective when the application is submitted and if submitted prior to the trigger date,

the portions of the 2002 and 1992 NSR rules that pertained to pollution control projects, among other provisions. In response to this Court action, on June 5, 2007, EPA removed these provisions from the NSR regulations. (See 72 FR 32526). These provisions were added as part of EPA’s NSR improvement rule that was issued on December 31, 2002.

then the application and permit would not need to address GHGs. Several commenters also asked that PSD sources with a valid permit that commences construction within 18 months of the trigger date not be required to seek a revised PSD permit for GHGs. Similarly, several commenters asked that PSD permits issued prior to the GHG trigger date not be required to be reopened only for the purpose of addressing GHG emissions. Additional commenters asked that we clarify that sources or projects not be required to obtain PSD permits if they obtained a determination that PSD did not apply (a “non-applicability” determination) prior to the GHG trigger date. Finally, many commenters also requested “grandfathering” for title V so that existing title V applications and permits do not need to be amended, revised, or resubmitted to address GHGs after they become “subject to regulation.” Other commenters asked that transition provisions for title V be provided in the final action that would be similar to those requested for PSD.

We partially addressed transitional issues for PSD permitting in our April 2, 2010 final action on reconsideration of the Interpretive Memo. 75 FR 17021. This action addressed the applicability of PSD permitting requirements for GHGs to pending PSD permit applications that were (or will be) submitted prior to January 2, 2011 based on emissions of pollutants other than GHGs. However, we have not yet addressed the questions raised by public comments concerning sources that obtain PSD permits, minor NSR permits, or determinations that no such permits are needed prior to the Step 1 period set forth in this rule. We have also not yet addressed questions about the applicability of PSD permitting requirements for sources that are not currently required to submit an application for a PSD permit but that could be required to do so in Step 2 of the phase-in established in this action. In addition, our April 2, 2010 action did not address transitional issues concerning the application of the title V provisions to GHGs.

a. Transition for PSD Permit Applications Pending When Step 1 Begins

In our action on April 2, 2010, EPA explained that the Agency did not see grounds to establish a transition provision for pending PSD permit applications because we had determined that PSD permitting requirements would not apply for GHGs for another 9 months. We explained that permit applications submitted prior to

April 2, 2010 should in most cases be issued prior to January 2, 2011 and, thus, effectively have a transition period of 9 months to complete processing before PSD requirements become applicable to GHGs. We also observed that, in the case of any PSD permit application review that cannot otherwise be completed within the next 9 months based on the requirements for pollutants other than GHGs, it should be feasible for permitting authorities to begin incorporating GHG considerations into permit reviews in parallel with the completion of work on other pollutants without adding delay to permit processing. Additional discussion of EPA’s reasons for not developing transition provisions for PSD permit applications that are pending on January 2, 2011 are provided in the April 2, 2010 notice. 75 FR 17021–22.

For these same reasons, we continue to feel that a transition period is not warranted to incorporate GHG requirements into any PSD permit applications that are pending when Step 1 of the permitting phase-in begins for those sources that would otherwise need to obtain a PSD permit based on emissions of pollutants other than GHGs. Thus, this action makes no change to the position we expressed on this particular issue in the April 2, 2010 notice. In this final rule on tailoring the PSD program to address GHGs, we have determined that the additional burden of incorporating GHG requirements into PSD permits for the sources already required to obtain such permits is manageable in the Step 1 period. Thus, this rule has added no additional requirements or limitations that would justify deferring the establishment of pollution controls for this category of GHG sources once PSD permitting requirements are initially triggered for GHGs.

While we do not provide for grandfathering of PSD applications, we do note that there are more than 7 months left before GHG BACT requirements will be triggered at anyway sources for projects that increase GHG emissions by more than 75,000 tpy CO₂e and more than a year before the requirements would be triggered at sources solely because of emissions of GHGs (more than 100,000 tpy of CO₂e). We intend to work constructively and affirmatively with permitting authorities to use this time to ensure expeditious processing of pending permits and to further assure that the triggering of BACT requirements at such sources will not result in adverse impacts on pending projects. We have separately described our plans to expeditiously issue GHG

BACT guidance, but we understand that for pending projects that will be permitted soon after January 2, 2011, an opportunity for earlier engagement with EPA on BACT issues would be beneficial for permitting authorities to issue these permits without delay.

Therefore, following the issuance of this rule, we will contact permitting authorities that have pending PSD permit applications to identify those applications with a reasonable likelihood that final issuance will occur after January 2, 2011, and therefore will be required to contain GHG BACT limits. We will then work closely with those permit agencies to provide technical, legal, or policy assistance to help prepare BACT analysis and provide additional support as necessary to expedite permitting for those pending applications. Similarly, when EPA is the permitting authority, we will provide assistance to applicants with pending permits to ensure that GHG permitting decisions are made promptly, and that administrative processes move forward expeditiously.

b. PSD Permits Issued Prior to Step 1

EPA has not historically required PSD permits to be updated or reopened after they are issued in the absence of an action by the applicant to change the physical or operational characteristics of the source described in the permit application. EPA's PSD permitting regulations contain no provisions that address the modification or amendment of a PSD permit or require a PSD permit to be reopened or modified on the basis of new PSD permitting requirements that take effect after the final permit is issued. Since PSD permits are construction permits, EPA has not required updates to PSD permits in the same manner as is typically required for operating permits that incorporate a variety of applicable requirements (such as title V permits and National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act). In addition, unlike operating permits, PSD permits are not required to be renewed. However, if construction under a PSD permit is not commenced in a timely manner or is discontinued for an extended period, a PSD permit may expire if an extension is not requested or justified. See 40 CFR 52.21(r)(2); 40 CFR 124.5(g).

With respect to the application of PSD permitting requirements for GHGs beginning on January 2, 2011, we do not see any cause to deviate from our historical practice of not requiring PSD permits to be reopened or amended to incorporate requirements that take effect after the permit is issued. Thus, we are

not promulgating any new rules or requirements pertaining to PSD permits issued prior to Step 1 of the phase-in described in this rule. There is no mandatory requirement to reopen a previously issued PSD permit to incorporate GHG requirements that were not applicable at the time the permit was issued.

A major source that obtains a PSD permit prior to January 2, 2011 will not be required under EPA regulations to reopen or revise the PSD permit to address GHGs in order for such a source to begin or continue construction authorized under the permit. Our current PSD permitting regulations provide that "[n]o new major stationary source or major modification to which the requirements of paragraphs (j) through (r)(5) of this section apply shall begin actual construction without a permit that states the major stationary source or major modification will meet those requirements." 40 CFR 51.166(a)(7)(iii); 40 CFR 52.21(a)(2)(iii). The term "begin actual construction" generally means "initiation of physical onsite construction activities on an emissions unit which are of a permanent nature" and includes activities such as "installation of building supports and foundations, laying underground pipework and construction of permanent storage structures." 40 CFR 51.166(b)(11); 40 CFR 52.21(b)(11). A source that begins actual construction authorized under a PSD permit prior to January 2, 2011 will not be in violation of the prohibition described previously if it continues construction after that date. This portion of the regulation precludes only beginning construction without the appropriate preconstruction permit and does not require a permit to be updated to continue actual construction that has already begun.

Furthermore, a source that is authorized to construct under a PSD permit but has not yet begun actual construction on January 2, 2011 may still begin actual construction after that date without having to amend the previously-issued PSD permit to incorporate GHG requirements. Sections 51.166(a)(7)(iii) and 52.21(a)(2)(iii) require "a permit that states that the major stationary source or major modification will meet those requirements," which refers to the "requirements in paragraphs (j) through (r)(5)" referenced earlier in those provisions. EPA construes this language to describe a permit that meets the requirements of paragraph (j) through (r)(5) that are in effect at the time the permit is issued. Permitting and licensing decisions of regulatory

agencies must generally reflect the law in effect at the time the agency makes a final determination on a pending application. See *Ziffrin v. United States*, 318 U.S. 73, 78 (1943); *State of Alabama v. EPA*, 557 F.2d 1101, 1110 (5th Cir. 1977); *In re: Dominion Energy Brayton Point, LLC*, 12 E.A.D. 490, 614–616 (EAB 2006); *In re Phelps Dodge Corp.*, 10 E.A.D. 460, 478 n. 10 (EAB 2002).

Thus, a source may begin actual construction on or after January 2, 2011 under a PSD permit that authorized construction to begin prior to January 2, 2011 because such a permit states that the source will meet the requirements of paragraphs (j) through (r)(5) of these regulations (or state equivalents) that were in effect at the time the permit was issued. However, this would not be the case if the permit has expired because the applicant has discontinued construction or failed to commence construction by the necessary date. See 40 CFR 52.21(r)(2).

This approach is consistent with EPA's practice when the preconstruction permitting requirements change by virtue of the designation of an area as a nonattainment area after a PSD permit is issued. In transitional guidance issued by EPA in 1991, EPA explained that "the area designation in effect on the date of permit issuance by the reviewing agency determines which regulations (part C or D) apply to that permit." Memorandum from John S. Seitz, Director OAQPS, New Source Review (NSR) Program Transitional Guidance, page 6 (March 11, 1991). This memorandum explained further that "where a source receives a PSD or other permit prior to the date the area is designated as nonattainment, the permit remains in effect" as long as the source meets the conditions necessary to prevent the permit from expiring. *Id.* at 6.

This approach does not apply if the source engages in a major modification after January 2, 2011 that is not authorized by the previously issued permit. Once Step 1 of the phase-in begins, if the PSD requirements for GHGs are applicable to a previously-permitted source that engages in a major modification not covered by the permit, such a source will need to obtain a new PSD permit to authorize the modification and that permit may need to include GHG requirements depending on the level of increase in GHGs that results from the modification.

c. Additional Sources for Which PSD Applies in Step 2

In light of the terms of existing PSD regulations and the lead time provided in this action for sources that will first

become subject to PSD permitting in Step 2, we do not believe there is presently a need to establish transition provisions for sources that will be required to obtain PSD permits for the first time in Step 2 of the phase-in. As described previously, under our current PSD permitting regulations, a new major stationary source or major modification may not begin actual construction without a PSD permit that meets the applicable preconstruction permitting requirements. 40 CFR 51.166(a)(7)(iii); 40 CFR 52.21(a)(2)(iii).

Since a permit must be obtained before a major source may begin actual construction, the major source preconstruction permitting requirements in 40 CFR 51.166 and 52.21 of the regulation do not generally apply to a source that begins actual construction at a time when it was not a major source required to obtain a PSD permit. One exception, however, is the unique circumstance when a source becomes a major source solely by virtue of the relaxation of an enforceable limitation on the source's PTE. 40 CFR 51.166(r)(2); 40 CFR 52.21(r)(4). But absent these circumstances, PSD preconstruction permitting requirements do not generally preclude a source from continuing actual construction that began before the source was a source required to obtain a PSD permit. Thus, a source that began actual construction under the authorization of any previously required minor source or state construction permit is not required to meet any PSD preconstruction permitting requirement that becomes applicable after actual construction begins unless the source engages in a major modification after PSD permitting requirements are applicable. Likewise, a PSD permit is not required after a source begins actual construction based on a valid determination (by the source or the permitting authority) that the source need not obtain either a major PSD permitting requirements or and minor NSR permit. Based on these provisions in existing regulations, EPA will not require any sources to which PSD permitting requirements begin to apply in Step 2 to obtain a PSD permit to continue construction that actually begins before Step 2 begins.

However, we will expect Step 2 sources that begin actual construction in Step 2 (*i.e.*, beginning July 1, 2011) to do so only after obtaining a PSD permit in accordance with 40 CFR 52.21 or 51.166, or any applicable state regulation that meets the requirements of 40 CFR 51.166. We recognize the potential for the triggering of Step 2 to result in a change in status where a

project may legally have begun actual construction before Step 2 but did not do so and would then need a PSD permit. However we also note that we are providing over a year of lead time before PSD permitting requirements become applicable to Step 2 sources. If projects would be adversely affected by this change in status, this lead time affords an opportunity for sources planning such projects to secure appropriate minor NSR permits (which generally take less than a year to issue), non-applicability determinations, etc. in time to avoid such a change in status. If a new or modified source that would become newly subject to PSD in Step 2 plans to begin actual construction before Step 2, it has more than a year to obtain the applicable preconstruction approvals and begin actual construction. Likewise, a Step 2 source that does not anticipate the ability to begin actual construction before Step 2 begins should have enough lead time to submit a PSD permit application and obtain the necessary permit without significantly delaying the project further. Therefore, we do not think it is necessary or appropriate to promulgate a transition provision that would exempt Step 2 sources from PSD permitting requirements that will apply based on construction that begins after Step 2 takes effect.

This approach for Step 2 sources that have obtained a minor source construction permit or non-applicability determination differs from the approach described previously for source that obtained a PSD permit prior to Step 1. As described previously, a Step 1 source that is authorized to begin actual construction before January 2, 2011 under a previously-issued PSD permit may begin actual construction under that permit after January 2, 2011 without modifying the PSD permit to address GHGs. However, a Step 2 source that was not required to obtain a PSD permit before Step 2 begins would need to obtain a PSD permit addressing GHGs if it has not yet begun actual construction prior to Step 2, even if the source had obtained any preconstruction approvals that were necessary to authorize construction prior to Step 2. This is because such a Step 2 source that begins actual construction after Step 2 would likely be doing so without having any permit meeting the requirements of paragraphs (j) through (r)(5) of 40 CFR 52.21 or 51.166, or a state equivalent. A source that has obtained only a minor source permit prior to Step 2 but that begins actual construction after July 1, 2011 would violate the requirements of 40

CFR 52.21(a)(2)(iii) or 51.166(a)(7)(iii), or a state equivalent, unless the source took care to ensure that it was authorized to construct under a PSD permit or could demonstrate that the source's minor source construction permit makes clear that requirement of paragraphs (j) through (r)(5) of 40 CFR 52.21 or 51.166, or a state equivalent, would be met by the source even though such a permit was not nominally a PSD permit. This difference in approach for non-PSD sources is driven by the terms of 40 CFR 52.21(a)(2)(iii) and 51.166(a)(7)(iii). Since we have not provided any prior notice that we might be considering revisions to 40 CFR 52.21 and 51.166 to address this topic, we are unable to revise the regulations in this action to achieve the same result for non-PSD sources as for PSD sources. Furthermore, at the present time, we see no indication that this difference in approach is unreasonable since non-PSD sources will not trigger permitting for GHG until Step 2 (only anyway PSD source trigger in Step 1). Thus sources will have until July 1, 2011, an additional 6 months of lead time (for a total of more than 14 months), to prepare for the transition described here. Nevertheless, we recognize that the transition to the increased coverage of new sources and modifications that occurs in July will represent an unusual occurrence that may have unanticipated impacts. For this reason it is important to note that nothing in this rule forecloses our ability to further address such impacts, as necessary, by adopting rule changes or using other available tools.

EPA has previously promulgated exemptions that have authorized some sources that were not previously subject to the PSD regulations to commence construction on the basis of minor source permits after the date new PSD requirements have took effect in 1978 and 1980. *See, e.g.*, 40 CFR 52.21(i)(1)(iv)–(v). There is a notable distinction between these provisions, which use the term “commence construction,” and the terms of 40 CFR 52.21(a)(2)(iii) and 51.166(a)(7)(iii), which use the term “begin actual construction.” “Commence construction” is defined more broadly than “begin actual construction” to include obtaining all necessarily preconstruction approvals and either beginning actual on-site construction or entering into binding contracts to undertake a program of actual construction. 40 CFR 52.21(b)(9); 40 CFR 51.166(b)(9). The term “commence construction” is also defined in the CAA. 42 U.S.C. 7479(2)(A). Among

other purposes, the term “commence construction” is generally used in the Act and EPA regulations to distinguish construction activities that are exempt from new PSD permitting requirements from those that are not. *See, e.g.*, 42 U.S.C. 7475(a); 40 CFR 52.21(i)(1)(i)–(v). In the absence of an explicit exemption in the CAA or the PSD regulations that uses the term “commence construction,” we do not believe we can use the date a source “commences construction” under a minor source construction permit approval as a demarcation point for Step 2 sources that may continue ongoing construction activities without having to obtain a PSD permit based on emissions of GHGs. Since we did not provide prior notice of an intention to adopt transition provisions applicable to this situation, we are unable to adopt such an exemption in this action that applies the term commence construction in this context. Consequently, the approach described previously applies the term “begin actual construction” based on the language in 40 CFR 52.21(a)(2)(iii) and 51.166(a)(7)(iii).

d. Transitional Issues for Title V Permitting

Since the title V permitting regulations already include a robust set of provisions to address the incorporation of new applicable requirements and other transitional considerations, we do not see grounds to establish unique transition or grandfathering provisions for GHGs in this action. Furthermore, since the purpose of title V is to collect all regulatory requirements applicable to a source and ensure compliance, we do not believe special exemptions for GHG requirements are likely to be justified. The existing title V rules do not provide any exemptions that relieve the obligation to incorporate all applicable requirements into a title V permit. However, the title V regulations contain numerous provisions that allow a reasonable period of time for incorporating new applicable requirements or applying for a title V permit that was not previously required. Transitional issues for incorporation of GHG requirements into title V permitting generally involve questions in the following categories: (1) Permit application requirements for sources not previously subject to title V that will become subject to title V requirements in Step 2 of the phase-in; (2) the need for updates or amendments to title V permit applications that are pending when GHGs become subject to regulation in Step 1 of the phase-in; and (3) the incorporation of new applicable

requirements for GHGs into existing permits for sources currently subject to title V.

With respect to the first category, a title V source applying for the first time must submit its permit application within 12 months after the source “becomes subject to the [operating] permit program” or such earlier time that the permitting authority may require (*see* 40 CFR 70.5(a)(1)). Sources not otherwise subject to title V can become major sources subject to title V due to emissions of GHG no sooner than July 1, 2011. If a source becomes “subject to the [operating] permit program” on July 1, 2011, then its permit application under the title V operating permit program would typically have to be submitted no later than July 1, 2012.

There are also existing regulations relevant for the second category of GHG transition issues, where sources currently subject to title V have title V permit applications pending with a permitting authority as of January 2, 2011. Where additional applicable requirements become applicable to a source after it submits its application, but prior to release of a draft permit, the source is obligated to supplement its permit application. *See* 40 CFR 70.5(b); 71.5(b). Furthermore, title V permits are generally required to contain provisions to assure compliance with all applicable requirements at the time of permit issuance. *See* CAA section 504(a); 40 CFR 70.6(a)(1) and 71.6(a)(1). If a permitting authority determines that additional information is necessary to evaluate or take final action on an application (*e.g.*, because of uncertainty over whether a draft permit assures compliance with all applicable requirements), it may, and should, request additional information from the source in writing and set a reasonable deadline for a response. *See* 40 CFR 70.5(a)(2); 71.5(a)(2).

Likewise, the existing title V regulations provide sufficient transition for the third category of issues, where a source has additional GHG-related applicable requirements (such as the terms of a PSD permit) that must be incorporated into its existing title V permit. Where a source is required to obtain a PSD permit, the source must apply for a title V permit or permit revision within 12 months of commencing operation or on or before such earlier date as the permitting authority may establish (or prior to commencing operation if an existing title V permit would prohibit the construction or change in operation). *See* 40 CFR 70.5(a)(1)(ii); 71.5(a)(1)(ii); *see also* 40 CFR 70.7(d) and (e); 71.7(d)

and (e) (permit modifications). In addition, where a source becomes subject to additional applicable requirements, the permitting authority is required to reopen the permit to add those applicable requirements if the permit term has three or more years remaining and the applicable requirements will be in effect prior to the date the permit is due to expire. *See* 40 CFR 70.7(f)(1)(i); 71.7(f)(1)(i).

Finally, EPA notes that the existing title V regulations require sources to furnish permitting authorities, within a reasonable time, any information the permitting authority may request in writing to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, and for other reasons, and further provide that permitting authorities shall reopen and revise permits if EPA or the permitting authority determine that the permit must be revised or revoked to assure compliance with applicable requirements. *See* 40 CFR 70.6(a)(6)(v); 71.6(a)(6)(v) and 70.7(f)(1)(iv); 71.7(f)(1)(iv).

Thus, EPA believes that the existing title V regulations provide an adequate regulatory framework for managing the transition to incorporating GHG requirements in title V permits and additional specific exemptions or transition rules for title V are not currently warranted.

VI. What are the economic impacts of the final rule?

This section of the preamble examines the economic impacts of the final rule including the expected benefits and costs for affected sources and permitting authorities. The final rule uses a phased-in approach for requiring sources of GHG emissions to comply with title V operating permit and PSD statutory requirements, essentially lifting this burden for the phase-in period for a large number of smaller sources of GHG. Thus, this rule provides regulatory relief rather than regulatory requirements for these smaller GHG sources. For larger sources of GHGs that will be required to obtain title V permits and/or comply on PSD requirements, there are no direct economic burdens or costs as a result of this final rule, because these requirements are not imposed as a result of this rulemaking. Statutory requirements to obtain a title V operating permit or to adhere to PSD requirements are already mandated by the CAA and by existing rules, not by this rule. Similarly, this rule will impose costs to society in the form of foregone environmental benefits resulting from GHG emission reductions that, absent this rule, might otherwise

have occurred at sources deferred from permitting during the phase-in period.

The RIA conducted for this final rule provides details of the benefits or regulatory relief that smaller GHG sources will experience in terms of costs avoided as a result of this final rule and the potential for social costs in terms of foregone environmental benefits during this 6-year period. Complete details of the RIA conducted for this final rule may be found in the document "Regulatory Impact Analysis for the Final Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule," in the docket for this rulemaking.

This rulemaking provides permitting thresholds for sources of GHG that exceed levels contained in the CAA, and these levels are phased-in steps based upon application of the "administrative necessity" and "absurd results" doctrines as explained in section V.B. For Step 1, which is effective from January 2, 2011, through June 30, 2011, only sources required to undergo title V or PSD permitting based upon non-GHG air pollutants are required to obtain an operating permit or PSD permit to include GHG emissions (referred to as the "anyway" threshold). Step 2, effective from July 1, 2011, until such time as EPA acts on a rule to amend it (which for reasons described previously, we assume is June 30, 2013, for the purposes of this analysis), will phase in title V permit requirements for larger sources emitting GHG above 100,000 tpy CO₂e (if they do not already have one) and phase in for such sources, PSD requirements when they are newly constructed or modify in a way that increases emissions by more than a 75,000 tpy CO₂e significance level. Step 2 is referred to as the 100,000 tpy CO₂e threshold. Thereafter, EPA makes an enforceable commitment to consider a possible Step 3 to further lower thresholds below 100,000 tpy CO₂e and/or permanently exclude some sources from the program(s), but only after a regulatory process is conducted addressing "administrative necessity" and "absurd results" considerations based upon the actual permitting experiences in the first two steps of the phase-in. In addition, EPA provides a deferral of permitting until we take required action in April 2016 for sources and modifications that emit below 50,000 tpy CO₂e. The deferral will end when a required study is conducted of the permitting process for sources of GHG and EPA acts, based on the study, to promulgate a rule that describes the additional GHG permitting requirements beyond 2016. In the 6 years following promulgation of this

rule, the EPA estimates that compared to baseline estimates that do not include the effects of this rule, over six million sources of GHG emissions in total will be allowed to continue to operate without a title V operating permit. During this period, tens of thousands of new sources or modifying sources each year will not be subject to PSD requirements for GHG. For this large number of smaller sources, this rule alleviates the regulatory burden associated with obtaining an operating or PSD permit or complying with NSR BACT requirements. Therefore, this final action may be considered beneficial to these small sources because it provides relief from regulation that would otherwise be required.

This decision does potentially have environmental consequences in the form of higher emissions during the 6-year period of time (generally because emissions increases would have been lower if BACT were applied). These consequences are limited due to the fact that sources between 100/250 and 100,000 tpy CO₂e account for an estimated 11 percent of the six directly emitted GHG nationally from industrial, commercial, and residential source categories, while representing over 95 percent of the total number of sources potentially requiring an operating or PSD permit for GHG under current permitting thresholds in the CAA. Moreover, requiring such a large number of small sources to obtain permits for the first time would overtax the permitting authorities' abilities to process new permits and would therefore interfere with any such benefits actually being achieved. Moreover, reductions from these small sources will still be occurring, notwithstanding the fact that permitting requirements would not apply to them. These smaller sources of GHGs will be the focus of voluntary emission reduction programs and energy efficiency measures that lead to reductions in GHGs. We will also reevaluate this decision after a 6-year period and complete a study of the implications for those sources and permitting authorities of permitting smaller GHG sources beyond 2016.

In reaching the preceding decisions for this final rule, we carefully considered comments received on the Tailoring Rule proposal. We received several comments specifically on our description of the impacts of this rule. Most of these comments disagreed with our assertion that the rule is a "relief" rule. Others assert that we should have prepared a more comprehensive RIA than prepared for the rule proposal.

Those commenting contend: (1) We understated the burdens of the rule while overstating its relief at proposal; (2) we erroneously omitted the impacts for "larger sources" of GHGs from the proposal RIA and should have recognized the burden to "larger sources" due to other GHG actions; (3) the economic impacts the rule will have on industry and the U.S. economy and society in general will be burdensome, especially given the current state of the economy; and (4) we need to propose a full RIA or a complete estimation of impacts to comply with CAA section 307(d) and the APA.

EPA has carefully considered the comments addressing the issue of whether the Tailoring Rule is a regulatory "relief rule," and we are not persuaded that we erred in concluding that the effect of the Tailoring Rule is to provide regulatory relief to a large number of sources of GHG for a period of up to 6 years. This final rule will provide relief from title V permitting to over 6 million sources of GHG in this country. Likewise tens of thousands of sources potentially subject to PSD permitting requirements annually for GHG will have regulation postponed for a period of up to 6 years under this rule, followed by an additional required rule addressing the period beyond 6 years. While larger sources of GHG may be required to obtain title V permits or modify existing permits and to comply with PSD requirements, these burdens result not from the Tailoring Rule but rather from the CAA requirements to apply PSD and title V to each pollutant subject to regulation, which are triggered when the LDVR takes effect. To clearly illustrate this, consider what would occur if EPA did not complete the Tailoring Rule. Sources would not be relieved of the requirement to obtain permits addressing each pollutant subject to regulation when they construct or modify, nor would they be relieved of their obligation to obtain title V permits. Instead, these requirements would simply apply to a much larger population of sources and modifications, and would lead to the absurd results and severe impairment to program implementation that this rule is designed to address.

In response to comments asserting that the RIA completed for proposal of this rulemaking: (1) Understated the burdens of the rule and overstated the benefits, (2) did not fully recognize the rule will be burdensome, especially given the current state of the economy; and (3) does not consider a complete estimation of impacts to comply with the APA and CAA section 307(d) and needs to correct flawed or erroneous

assumptions, EPA did make improvements and modifications to the RIA completed for this final rule. Based upon comments, EPA modified estimates of the number of sources affected at various threshold levels upward. EPA also improved the burden estimates associated with obtaining permits for sources and permitting authorities.

After consideration of the burden imposed by the proposed rule with these improved estimates for affected sources, the EPA modified the steps of the phase-in period to include two initial steps, described in section V, that are higher, and therefore cover fewer sources and are less burdensome than the proposal threshold of 25,000 tpy CO₂e emissions. EPA also increased the threshold below which permitting would not apply for 6 years from 25,000 to 50,000 tpy CO₂e. After the initial two step period, EPA has committed to consider lower thresholds but only down to 50,000 tpy CO₂e, and only after a regulatory process that uses information gathered on actual permitting activity during the first two steps of the phase-in period. The RIA conducted for the final rule also incorporates improvements in our estimates of the number of sources affected at alternative thresholds and improved estimates of the costs of obtaining permits by sources and processing permits by permitting

authorities. The EPA acknowledges that the regulatory relief associated with the control costs due to BACT requirements for PSD new and modifying sources is not included in the RIA for the final rule due to the lack of sufficient data about the nature of those requirements. However, it is the case that, as it relates to burden, those estimates would simply increase the amount of regulatory relief associated with this final rule.

Finally, with regard to comments that the RIA should have been a more comprehensive analysis to include the larger sources of GHG that will be required to obtain permits when GHG are regulated, the EPA maintains as previously explained that there are no direct economic burdens or costs as a result of this rule for these sources. Requirements for larger GHG sources to obtain title V or PSD permits are already mandated by the Act and by existing rules and are not imposed as a result of the Tailoring Rule. Thus the economic impacts for larger sources of GHG do not occur because of this Tailoring Rule. To include these larger sources in the RIA would actually be an inaccurate assessment of how this rule affects sources and would ignore the fact that this rule provides regulatory relief.

A. What entities are affected by this final rule?

As previously stated, this final rule does not itself result in the application

of permitting requirements to any industrial, commercial, or residential entities. Entities affected by this rule are those who experience regulatory relief due to the higher thresholds and deferred applicability set forth in this rule. This action increases the threshold to obtain a title V and PSD permitting from statutory CAA levels using a phased-in step process as previously discussed. As Table VI–1 shows, this action lifts permitting requirements for over six million potential title V sources in total and tens of thousands of potential PSD new sources annually that would be otherwise required by the CAA to obtain permits. Under Step 1, over six million title V sources in total and approximately 20 thousand new PSD sources per year will not be required to obtain permits. Under Step 2, requiring sources over a 100,000 tpy CO₂e to obtain a permit, over six million title V sources in total and approximately 19.9 thousand new PSD sources per year will obtain regulatory relief. While the threshold approach differs for Steps 1 and 2 of the phase-in plan, the estimated number of sources affected does not differ greatly as shown in Table VI–1. Sectors experiencing this regulatory relief include electricity, industrial, energy, waste treatment, agriculture, commercial and residential.

TABLE VI–1—ESTIMATED NUMBER OF AFFECTED SOURCES EXPERIENCING REGULATORY RELIEF^{1, 2}

Sector	Number of sources experiencing regulatory relief			
	Step 1 <i>Anyway</i>		Step 2 <i>100,000 tpy</i>	
	Title V	New PSD	Title V	New PSD
Electricity	285	93	285	33
Industrial	170,910	604	170,654	599
Energy	2,588	48	2,536	44
Waste Treatment	3,358	2	3,165	1
Agriculture	37,351	299	37,351	299
Commercial	1,355,921	12,041	1,355,870	12,039
Residential	4,535,500	6,915	4,535,500	6,915
Totals	6,105,913	20,002	6,105,361	19,930
% Emissions Covered ³	13%		11%	

Notes: (1) Number of sources is determined on a PTE basis. Estimates for title V are the total number of sources expected to experience regulatory relief. PSD sources are annual estimates of newly constructed facilities and do not include modifications at existing facilities that may also be subject to PSD requirements. (2) See appendices to “Regulatory Impact Analysis of the Final Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule” for more details of how thresholds and sources affected are developed. (3) Percentage of emissions covered represent estimated actual emissions from sources expected to experience regulatory relief as a percentage of total stationary source GHG emissions.

B. What are the estimated annual benefits to sources due to regulatory relief from the statutory requirements?

EPA estimated the annual benefits (avoided costs) to sources of GHG emissions and permitting authorities

anticipated from this final rule. In addition, an accounting of the benefits from this action as measured by avoided permit processing costs for state, local, and tribal permitting authorities is provided. These benefits or avoided

costs relate specifically to permit burden costs postponed for smaller sources of GHG emissions otherwise required to obtain an operating permit under title V or required to modify an existing permit to address GHG

emissions. Avoided costs shown also include permit burdens for additional PSD permits postponed for new or modifying smaller sources of GHG, as well as the avoided costs to state, local and tribal permitting authorities. We are providing an illustrative monetary estimate of statutory permitting requirements to show the magnitude of the savings that hypothetically result from this rulemaking. While we believe it is impossible to implement these permit requirements by January 2, 2011, for the reasons laid out in this preamble, it is useful to understand the scale of what the burden may have been. For sake of simplicity, we refer to this illustrative monetary estimate as the monetized benefits of the regulatory relief presented by this rulemaking or regulatory relief benefits for brevity.

These benefit estimates do not consider avoided emission control costs associated with PSD requirements for potential BACT requirements. Estimates for BACT are unavailable at this time because of the difficulty predicting the results of the BACT process as it would be applied to new pollutants and classes

of sources for which there is no previous BACT experience on which to rely.

1. What are annual estimated benefits or avoided burden costs for title V permits?

Table VI-2 shows that the estimated annual title V benefits to sources and to permitting authorities in terms of avoided information collection cost resulting from this final action to be approximately \$70,535 million under Step 1 of the phase-in. These avoided costs become \$70,520 million annually under Step 2 of the phase-in, where permitting is required for sources at or above the 100,000 tpy CO₂e threshold. Under the anyway threshold Step 1, approximately \$49,457 million in regulatory relief will accrue to sources and approximately \$21,078 million to permitting authorities annually in the form of avoided permit processing costs. With the 100,000 tpy CO₂e threshold for phase-in Step 2, these annual regulatory relief benefits are expected to be quite similar at \$49,447 million for sources of GHG emissions and \$21,072 million for permitting authorities. Industrial

sources permitting costs are estimated to be \$46.4 thousand per permit for a new permit and \$1.7 thousand for a permit revision. The EPA estimates that over tens of thousands of industrial sources per year will avoid incurring these permitting costs under Steps 1 and 2 of the phase-in period. The cost for a permit for new commercial and residential sources is estimated to be \$23.2 thousand per permit with approximately 2 million of these permits avoided annually.

State, local, and tribal permitting authorities will also benefit in terms of avoided permitting administrative costs of over \$21 billion as a result of the decisions final in this action. For industrial sources, the cost for permitting authorities to process a new industrial title V permit is approximately \$19.7 thousand per permit and \$1.8 thousand for a permit revision. Similarly, permitting authority avoided permit processing costs are approximately \$9.8 thousand per permit for a new commercial or residential title V permit. All estimates are stated in 2007 dollars.

TABLE VI-2—ANNUAL TITLE V REGULATORY RELIEF FOR SOURCES AND PERMITTING AUTHORITIES^{1, 2}

Activity	Cost per permit (2007\$)	Step one anyway		Step two 100,000 tpy CO ₂ e	
		Number of permits	Avoided costs (millions 2007\$)	Number of permits	Avoided costs (millions 2007\$)
Sources:					
New Industrial	\$46,350	71,829	\$3,329	71,657	\$3,321
New Commercial/Residential	23,175	1,985,948	46,024	1,985,930	46,024
Permit revisions due to GHG	1,677	61,836	104	60,921	102
Source Total		2,119,613	49,457	2,118,508	49,447
Permitting Authority:					
New Industrial	19,688	71,829	1,414	71,657	1,410
New Commercial/Residential	9,844	1,985,948	19,550	1,985,930	19,550
Permit revisions due to GHG	1,840	61,836	114	60,921	112
Permitting Authority Total		2,119,613	21,078	2,118,508	21,072
Total Title V Regulatory Relief ...			70,535		70,520

Notes: Sums may not add due to rounding.

¹ Annual title V avoided costs estimates represent information collection costs for one third of the total number of title V sources obtaining regulatory relief shown in Table VI-1 potentially requiring permits or permit revisions for GHG.

² More details on these estimated regulatory relief benefits are available in the appendices to the "Regulatory Impact Analysis for the Final Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule."

2. What are annual benefits or avoided costs associated with NSR permitting regulatory relief?

Table VI-3 summarizes the estimated annual permit burden costs avoided by sources and permitting authorities for PSD permitting due to this Tailoring Rule. The benefits associated with avoided cost of compliance for BACT for these sources is not included in these estimates due to a lack of available data. The estimated avoided burden or

reporting and recordkeeping cost that would occur absent this rule for new industrial sources to obtain permits is estimated to be \$84.5 thousand for a modifying PSD industrial source and \$59.2 thousand for a modifying commercial or multi-family residential source. New PSD sources will also be required to obtain a title V permit increasing these costs to \$130.9 thousand per permit for new industrial sources and to \$82.3 thousand per

permit for new commercial or multi-family residential sources. (Note the title V costs for these new PSD sources have been included in title V estimates shown in Table VI-2.) New and modifying sources avoid approximately \$5.5 billion annually in PSD permitting costs with this rule under the phase-in Step 1 threshold. Under the phase-in Step 2, 100,000 tpy CO₂e threshold and 75,000 tpy CO₂e significance level, this avoided PSD permitting cost estimate

becomes \$5.4 billion annually. State, local, and tribal permitting authorities are expected to avoid about \$1.51

billion annually in administrative expenditures associated with postponing PSD program requirements

for these GHG sources under Step 1 and \$1.49 billion under Step 2. All estimates are shown in 2007 dollars.

TABLE VI-3—ANNUAL PSD REGULATORY RELIEF FOR SOURCES AND PERMITTING AUTHORITIES^{1, 2}

Activity	Cost per permit (2007\$)	Step one anyway		Step two 100,000 tpy threshold, 75,000 significance level	
		Number of permits	Avoided costs (millions 2007\$)	Number of permits	Avoided costs (millions 2007\$)
Sources:					
New Industrial	\$84,530	26,089	\$2,205	25,174	\$2,128
New Commercial/Residential	59,152	55,509	3,283	55,505	3,283
Source Total		81,598	5,489	80,679	5,411
Permitting Authority:					
New Industrial	23,243	26,089	606	25,174	585
New Commercial/Residential	16,216	55,509	900	55,505	900
Permitting Authority Total		81,598	1,506	80,679	1,485
Total Title V Regulatory Relief ...			6,995		6,896

Notes: Sums may not add due to rounding.

¹ All estimates are based upon PTE. Regulatory relief shown represents annual estimates of PSD permitting costs avoided under Steps 1 and 2 of the phase-in period.

² More details on these estimated regulatory relief benefits are available in the appendices to the “Regulatory Impact Analysis for the Final Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule.”

C. What are the economic impacts of this rulemaking?

This final rulemaking does not impose economic burdens or costs on any sources or permitting authorities, but should be viewed as regulatory relief for smaller GHG emission sources and for permitting authorities. Although sources above the thresholds set in this rule will become subject to permitting on January 2, 2011, those impacts are not attributable to the present rulemaking. Rather they are mandated by the CAA and existing regulations and automatically take effect independent of this action.

In addition to considering the regulatory relief expected for affected entities as a result of this final rule, the EPA considered the impact of this rulemaking to small entities (small businesses, governments and non-profit organizations) as required by the *Regulatory Flexibility Act* (RFA) and the *Small Business Regulatory Enforcement Fairness Act* (SBREFA). For informational purposes, the RIA includes the SBA definition of small entities by industry categories for stationary sources of GHG and potential regulatory relief from title V and NSR permitting programs for small sources of GHG. Since this rule does not impose regulatory requirements but rather lessens the regulatory burden of the CAA requirements to smaller sources of GHG, no economic costs are imposed upon small sources of GHG as a result

of this final rule. Rather this action provides regulatory relief for small sources. These avoided costs or benefits accrue because small sources of GHG are not required to obtain a title V permit and new or modifying small sources of GHG are not required to meet PSD requirements. Some of the small sources benefitting from this action are small entities, and these entities will benefit from the regulatory relief finalized by this rule. For discussion of comments received and EPA responses regarding small entities impacts, see section VII of this preamble.

D. What are the costs of the final rule for society?

EPA examined the social costs of this final rule. These social costs represent the foregone environmental benefits that will occur as a result of the regulatory relief offered to sources of GHG emissions. This action is one of regulatory relief since it increases the emissions thresholds for the title V and PSD programs, as they apply to sources of GHG emissions, to levels above those in the CAA. In this preamble section, the benefits or avoided regulatory costs of such relief are discussed, but there is also a social cost imposed by such relief, because this rule may forego some of the possible benefits associated with title V and PSD programs for sources of GHG emissions below the permitting thresholds established. These benefits are those attributed to title V and PSD permitting programs in general. These

benefits are based upon the relevance of these programs to policymaking, transparency issues, and market efficiency, and therefore are very difficult to quantify and monetize. For title V, they include the benefits of improved compliance with CAA requirements that stem from (1) Improved clarity regarding applicability of requirements, (2) discovery and required correction of noncompliance prior to receiving a permit, (3) improving monitoring, recordkeeping, and reporting concerning compliance status, (4) self-certification of compliance with applicable requirements initially and annually, and prompt reporting of deviations from permit requirements, (5) enhanced opportunity for the public to understand and monitor sources' compliance obligations, and (6) improved ability of EPA, permitting authorities, and the public to enforce CAA requirements. However, it is important to remember that a title V permit generally does not add new requirements for pollution control itself, but rather collects all of a facility's applicable requirements under the CAA in one permitting mechanism. Therefore, the compliance benefits above are less when title V permits contains few or no CAA applicable requirements. During the initial steps of the phase-in plan established under this action, we expect that the vast majority of sources excluded from title V would be sources that have no CAA applicable

requirements for GHG emissions and few or no requirements for other pollutants because their emissions of those pollutants are so small. For this reason, while it is extremely difficult to measure the degree of improved compliance, if any, that would be foregone, or to quantify the social costs that would be imposed, we expect that they would be small. We will be evaluating this issue further during subsequent phases.

For PSD, the primary social cost imposed by the Tailoring Rule stems from the foregone benefit of applying BACT to the tens of thousands of small new sources and modifications that will be below our final thresholds during the first steps of the phase-in. This social cost potentially weighs against the cost savings described previously that stem (in part) from avoiding the administrative and control costs of applying BACT to these sources. The BACT requirement assures that new and modified sources, when they increase their emissions are using state-of-the-art emission controls and affords the public an opportunity to comment on the control decision. It does not prohibit increases but it assures that such controls are applied. Delaying the BACT requirement for numerous small sources during the first steps of the phase-in for this final rule could allow increases from these smaller sources that are greater than they would be if BACT were applied. A detailed analysis of this difference is beyond the scope of this rule, because we do not have detailed information on the universe of these tens of thousands of small PSD actions, the candidate BACT technologies for each of them, how permitting authorities would make the BACT decisions, and how the BACT limit would compare to what would otherwise be installed absent BACT.

It is not possible at this time to quantify the social costs of avoided BACT. However, we note that the universe of possible emissions that would be regulated by sources excluded under the Tailoring Rule is small compared to those that would remain subject to PSD. The sources excluded in

these first two steps of the phase-in plan of this action comprise only 11 percent of total stationary source GHG emissions, while 67 percent remain subject to regulation. Furthermore, we expect the emissions differences due to BACT controls for such sources to be relatively small due to the lack of available capture and control technologies for GHG at such sources that are akin to those that exist for conventional pollutants and sources, as well as the likelihood that even in the absence of BACT such sources would already be installing relatively efficient GHG technologies to save on fuel costs. Thus, while potential benefits would be foregone by excluding smaller sources from the permitting programs, these benefits are likely to be small. Under the Tailoring Rule, we will be working during the 6-year period to greatly improve our understanding of both the administrative costs of regulating and the social costs of not regulating smaller sources under PSD and title V, and we will be relying on that information to support our future threshold analyses called for under the action.

In reaching the decisions for this Tailoring Rule, the EPA recognizes that GHG emissions can remain in the atmosphere for decades to centuries, meaning that their concentrations become well-mixed throughout the global atmosphere regardless of emission origin, and their effects on climate are long lasting and significant. A detailed explanation of climate change and its impact on health, society, and the environment is included in EPA's TSD for the endangerment finding action (Docket ID No. EPA-HQ-OAR-2009-0171). The EPA recognizes the importance of reducing climate change emissions for all sources of GHG emissions including those sources afforded regulatory relief in this rule and plans to address potential emission reductions from these small sources using voluntary and energy efficiency approaches. Elsewhere, we have discussed EPA's interest in continuing to use regulatory and/or non-regulatory tools for reducing emissions from smaller GHG sources

because we believe that these tools will likely result in more efficient and cost-effective regulation than would case-by-case permitting.

E. What are the net benefits of this final rule?

The net benefits of this GHG tailoring rule represent the difference between the benefits and costs of this rule to society. As discussed in this preamble, this rule is one of regulatory relief and the benefits to society are estimates the regulatory relief (avoided permit burden costs) to sources and permitting authorities for Steps 1 and 2 of the phase-in period. The social costs of the rule are the foregone environmental benefits in the form of potential GHG emission reductions that could occur during the phase-in period and are discussed qualitatively.

This rulemaking provides regulatory relief for a phase-in period to smaller sources of GHG by phasing in the statutory permitting threshold at levels above statutory requirements. This final rule establishes thresholds and PSD significance levels for Steps 1 and 2 of the phase-in period (the 2.5 year period between January 2, 2011 and July 1, 2013), commits to considering a further Step 3, and indicates floor title V and PSD threshold levels from July 1, 2013 through April 30, 2016. The net benefits of the final rule for Steps 1 and 2 are $\$193,598+B-C$ million for the 2 and one-half year period where *B* denotes the unquantified benefits and *C* the quantified costs of this final rule. These unquantified benefits of this rule include the avoided PSD BACT costs for new and modifying sources. The unquantified costs previously discussed relate to the foregone environment benefits or GHG emission reductions that might be possible during the 2.5 year Step 1 and 2 phase-in period. These estimates are subject to significant uncertainties that are discussed at length in the Regulatory Impact Analysis for the Prevention of Significant Deterioration and Title V GHG Tailoring Rule contained in the docket to this final rule. All dollar estimates shown are based upon 2007\$.

TABLE VI-4—NET BENEFITS OF THE RULE FOR STEPS 1 AND 2 OF THE PHASE-IN PERIOD

	Final rule amounts (millions of 2007\$)
<i>Benefits—Regulatory Relief:</i>	
Sources	
Title V ¹	\$123,624
PSD ²	\$13,567
Total Source Regulatory Relief	\$137,190
Permitting Authority:	

TABLE VI-4—NET BENEFITS OF THE RULE FOR STEPS 1 AND 2 OF THE PHASE-IN PERIOD—Continued

	Final rule amounts (millions of 2007\$)
Title V ¹	\$52,684
PSD ²	\$3,724
Total Permitting Authority	\$56,407
Total Regulatory Relief	\$193,598+B
Costs—Foregone GHG Emission Reductions	
Title V & PSD	C
Net Benefits ³	\$193,598+B-C

Benefits represent regulatory relief for sources with the annual potential to emit below the thresholds shown.

B—Unquantified benefits of the rule include regulatory relief from BACT requirements for PSD sources.

C—Unquantified social costs of tailoring rule represents economic value of foregone environmental benefits (potential GHG emission reductions) during Step 1 and 2 of the phase-in period. Foregone GHG emission reductions are not known at this time.

¹ Reflects estimates of regulatory relief or avoided permit burden costs for title V GHG sources and permitting authorities.

² Shows estimates of regulatory relief or avoided permit burden costs for GHG PSD sources and permitting authorities.

³ Includes one-half year of Step 1 (anyway threshold), 2 years of Step 2 (100,000 threshold).

VII. Comments on Statutory and Executive Order Reviews

In this section, we provide responses to comments we received for various Executive Orders.

A. Comments on Executive Order 12866—Regulatory Planning and Review

At proposal, EPA prepared an analysis of the potential costs and benefits associated with EPA's Tailoring Rule proposal in an RIA. Several commenters state that EPA's failure to estimate the full costs of the effects of its interpretation of PSD applicability in the proposed Tailoring Rule violates Executive Order 12866. Some of these commenters maintain that Executive Order 12866 directs EPA to submit to the Office of Management and Budget (OMB) new significant regulations under consideration by the EPA. These commenters assert that, in the section 202 rule, EPA failed to analyze the effect on stationary sources in the cost benefit analysis and there is no indication that EPA included these impacts in its submission to OMB. According to the commenters, in EPA's proposal for this rulemaking, EPA has similarly failed to analyze the costs and benefits of triggering PSD for stationary sources. The commenters assert that without this key information, OMB could not fully review the impacts of the proposed rule. The commenters believe that EPA's failure to account for known costs that will occur as a direct result of the promulgation of the proposed rule in conjunction with the section 202 rule violates several applicable requirements of Executive Order 12866, including sections 6(B)(ii) and 6(C)(iii), which require assessments of the potential costs and benefits of the regulatory action and "reasonably feasible alternatives to the planned regulation,

identified by the Agencies or the public * * *" thereby violating both the APA and CAA section 307(d) because they deprive businesses and permitting authorities alike of a meaningful opportunity to comment on the rule.

The EPA has prepared a revised RIA assessing the benefits and costs of the final Tailoring Rule to support this rulemaking in accordance with Executive Order 12866, as was done with the proposal for this rulemaking. Similarly, the RIA completed for this action is subject to review by an Inter-agency review panel that includes OMB, as was the case with the proposal RIA. Further, the RIA completed for this final rule fully assesses the known benefits and costs associated with the Tailoring Rule. This final rule is one of regulatory relief from statutory requirements in which a large number of sources of GHGs will be relieved of the burden of title V and PSD permitting for a period of at least 6 years. This final rule will provide relief from title V permitting to over 6 million sources of GHG in this country. Likewise tens of thousands of sources potentially subject to PSD permitting requirements for GHGs will have regulation postponed for a period of at least 6 years. While larger sources of GHG may still be required to obtain title V permits or modify existing permits and to comply with PSD requirements, these burdens result from existing statutory requirements, not from this final Tailoring Rule.

B. Comments on the Paperwork Reduction Act

At proposal, we stated in the preamble that we did not believe that the proposal would impose any new information collection burden. We concluded that the proposed action would reduce costs incurred by sources and permitting authorities relative to the costs that would be incurred if EPA did

not revise the rule and provided estimates of those reduced costs. Further, we stated that, despite our estimated burden reductions, it was unnecessary for us to submit a new ICR to the OMB because the ICR contained in the existing regulations for PSD (*see, e.g.*, 40 CFR 52.21) and title V (*see* 40 CFR parts 70 and 71) had already been approved under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* and was assigned OMB control number 2060-0003 and OMB control number 2060-0336, respectively.

However, several commenters disagree that it was unnecessary for us to submit a new ICR for the proposed action. These commenters believe that (1) prior approval of an ICR for the PSD and title V programs ignores the fact that there would be an increase in the paperwork burden as a result of applying PSD and title V permitting requirements; and (2) unless EPA resubmits the information collection approval request to OMB with a proper and fully-inclusive analysis, EPA will lack authority to collect information from stationary sources for PSD and title V GHG emissions permitting.

As we stated in the proposal, this is a burden relief rule and as such it does not impose any new requirements for the NSR or title V programs that are not currently required. For that reason, we concluded that for purposes of this rule it was unnecessary for us to submit a new ICR to the OMB and that the ICR contained in the existing regulations for PSD (*see, e.g.*, 40 CFR 52.21) and title V (*see* 40 CFR parts 70 and 71) that had already been approved under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* and was assigned OMB control number 2060-0003 and OMB control number 2060-0336, respectively, still applies.

Nevertheless, we understand that once GHGs are regulated under the PSD and title V programs, there might be an increase in the overall paperwork burden for these programs. EPA will have to assess this possible burden during the normal course of 3-year renewal ICR process.

C. Comments on the RFA

At proposal, EPA certified that the proposed rule would not have a significant impact on a substantial number of small entities and therefore we are not obligated to convene a formal Small Business Advocacy Review (SBAR) panel. This certification was based upon the fact that the proposed action would relieve the regulatory burden associated with the major PSD and title V operating permits programs for new or modified major sources that emit GHGs, including small businesses. Nevertheless, EPA was aware at proposal that many small entities would be interested in the various GHG rulemakings currently under development and might have concerns about the potential impacts of the statutory imposition of PSD requirements that may occur as a result of the group of EPA actions, notwithstanding the relief provided to small businesses by the Tailoring Rule. For these reasons, and in collaboration with the SBA, EPA conducted an outreach meeting designed to exchange information with small entities that may be interested in these regulations. The outreach effort was organized and led by representatives from EPA's Office of Air Quality Planning and Standards within the Office of Air and Radiation, EPA's Office of Policy Economics and Innovation, the Office of Information and Regulatory Affairs within OMB, and the Office of Advocacy of the SBA. This meeting was conducted on November 17, 2009 in Arlington, VA, and documentation of this meeting, which includes a summary of the advice and recommendations received from the small entity representatives identified for the purposes of this process, can be obtained in the docket for this rulemaking. (See Docket No. EPA-HQ-OAR-2009-0517-19130.)

During the comment period, several commenters alleged that EPA inappropriately limited its RIA and RFA/SBREA analysis, and that had we done a comprehensive analysis, we would not have been able to certify that any of the proposed rules will not have a significant economic impact on a "substantial number of small entities." Thus they conclude that EPA failed to prepare and publicize an initial regulatory flexibility analysis (IRFA).

Additional commenters stated that EPA's failure to conduct an IRFA to assess the full costs of the effects of its interpretation of PSD applicability in the proposed Tailoring Rule violates a host of statutes and Executive Orders requiring analysis and public review of regulatory burdens. These commenters conclude that EPA should have convened one or more SBAR Panels.

We are not persuaded that we should have taken into account effects beyond those caused by the Tailoring Rule when we made our certification of no significant economic impact on a substantial number of small entities for this rule. No permitting requirements are imposed by this final Tailoring Rule. Instead, this final Tailoring Rule offers regulatory relief to over an estimated six million sources of GHG emissions that would otherwise be required to obtain a title V permit and tens of thousands of sources of GHG emissions subject to PSD permitting requirements that would otherwise be required statutorily to obtain permit. The RFA does not require that an agency complete a regulatory flexibility analysis or conduct an SBAR panel where the rule does not have any negative impact on small entities. For more discussion of RFA issues, please see the RTC document.

D. Comments on the Unfunded Mandates Reform Act

At proposal, EPA asserted that the Tailoring Rule does not impose unfunded mandates on any entities including sources and permitting authorities. Since the proposed Tailoring Rule is one of regulatory relief, it alleviates the burden of adhering to statutorily required permitting thresholds and does not impose regulatory requirements.

Some commenters on the proposed rule assert that EPA has failed to comply with the requirements of the Unfunded Mandates Reform Act (UMRA), pursuant to which EPA must assess the effects of the proposed rule on state, local, and tribal governments and the private sector. Specifically, these commenters state that section 202 of the UMRA requires EPA to prepare a written statement, including a cost-benefit analysis, for proposed rules with "federal mandates" that may result in expenditures to state, local, and tribal governments, in the aggregate, or to the private sector, of \$100 million or more in any 1 year. According to the commenters, in concluding that "the revisions would ultimately reduce the PSD and title V program administrative burden that would otherwise occur in the absence of this rulemaking," EPA did not account for the billions of

dollars that permitting authorities and stationary sources will soon be required to spend once PSD is triggered for GHGs. Additionally, a few commenters contend that the EPA underestimated the impacts to public utilities which are owned/operated by local governments and also to state regulatory agencies.

The EPA has carefully considered the comments on unfunded mandates expressed by commenters to the proposed rule. The EPA did complete a RIA for the final rule assessing the benefits and costs of the Tailoring Rule, including any unfunded mandates. As previously discussed, the Tailoring Rule is one of regulatory relief because it increases the GHG emissions threshold for NSR and title V permitting substantially above otherwise statutory requirements. As such, the EPA has determined that this Tailoring Rule does not impose unfunded mandates on any entities. This RIA of the final rule incorporates the extensive changes made in this final rule, including increased threshold levels for title V and PSD above those contained in the proposed rule. While we also incorporated improved estimates of the costs for sources to obtain permits and for permitting authorities to process permits, they do not change our conclusion that this final rule does not impose unfunded mandates on any entities.

E. Comments on Executive Order 13132—Federalism

Some comments received on the proposed rule assert that federalism concerns were ignored, in violation of Executive Order 13132. According to the commenters, EPA cannot maintain that the Tailoring Rule "will not have a substantial direct effect on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities between various levels of government," such that Executive Order 13132 does not apply. Some of these commenters assert that the proposed rulemaking would require radical changes in state laws, interjects GHGs into permit programs never once conceived for that purpose (any more than was EPA's), requires massive staff hiring at state agencies, and rewrites SIPs in place for years or even decades.

As we stated previously, this is a burden relief rule and as such it does not impose any requirements for the NSR or title V programs that are not currently required. In addition, this action does not interject GHGs into the permit programs, nor does it change state laws or SIPs to impose any new permitting requirements. Instead, this

action will significantly reduce the burden and costs incurred by sources and permitting authorities relative to the burden and costs that would be incurred if EPA did not revise the permitting provisions to account for higher applicability thresholds for GHG emissions.

However, since this rule finalizes burden reducing thresholds that will not otherwise apply to the PSD and title V programs, we are aware that a few states may have to amend their SIPs to incorporate these new thresholds if they do not incorporate federal rules by reference and cannot adopt our approach through interpretation. Executive Order 13132 is still not implicated by this rule because it finalizes burden reducing thresholds that would not otherwise apply to the PSD and title V programs.

F. Comments on Executive Order 13175—Consultation and Coordination With Indian Tribal Governments

The National Tribal Air Association (NTAA) supports EPA's proposed rule but requests that tribal air grant funding be increased to reflect the air quality-related needs of tribes across the nation, and to allow these tribes the opportunity to implement the CAA's PSD and title V programs. The NTAA states that, not only are tribes eligible for section 103 grant funding to conduct air quality monitoring, emissions inventories, and other studies and assessments, but they may also obtain section 105 grant funding to implement CAA regulatory programs. According to the NTAA, tribes are facing many of the same air-related issues that neighboring state and local jurisdictions are facing, but are significantly underfunded to address such issues.

The Agency is aware and concerned about the resource needs for the tribal air program and we are working to see how grant funding might be increased in the future. Nevertheless and for the purpose of the permitting programs, we want to clarify that tribes that develop Tribal Implementation Plans (TIPs) can charge for permits and tribes with delegation or authorization would develop permit fee programs under their authority (e.g., Navajo's permit fee program for their delegated title V permit program) to fund both the NSR and title V programs. For these reasons, there are a number of ways we would like to work with tribes to address the funding concern, including encouraging delegation or authorization of permitting programs and having model codes available for tribes that want to do TIPs for NSR and title V permitting.

G. Comments on Executive Order 13211—Actions That Significantly Affect Energy Supply, Distribution, or Use

Other commenters assert that EPA's analysis under Executive Order 13211 is insufficient because it addresses only smaller sources. These commenters contend that EPA has not meaningfully examined the energy implications of its proposed actions and interpretations of the CAA. The commenters disagree with EPA's conclusion that the imposition of costly PSD obligations on power plants would have no impact on power supply, distribution, or use, when those plants will have had no time to prepare for compliance and no idea what BACT may be for GHG emissions. Other commenters opine that the adoption of BACT for some industries newly-subject to PSD permitting requirements for GHGs could involve fuel-switching, and increased energy costs (due to the need for a source to convert from coal to natural gas to meet BACT).

Again, this action is a burden relief rule and as such it does not create any new requirements for sources in the energy supply, distribution, or use sectors. For the purpose of the BACT determinations for GHGs, the long-standing top-down BACT selection process still applies. Under the CAA and EPA's implementing regulations, BACT is still an emission limitation based on the maximum degree of emission reduction achievable through application of production processes and available methods, systems, and techniques that considers energy, environmental, and economic impacts. In other words, BACT determinations for GHGs will still have to consider energy, environmental and economic feasibility for the various control technologies under consideration before selecting a particular technology as BACT for a specific source. For that reason, what BACT may be for GHG emissions will vary by source, and the technology that is ultimately selected has to be one that is feasible based on the current energy, environmental and economic impacts that the planned technology might have. Thus, we do not believe that this action is likely to have a significant adverse effect on the supply, distribution, or use of energy.

VIII. Statutory and Executive Order Reviews

A. Executive Order 12866—Regulatory Planning and Review

Under section 3(f)(1) of Executive Order 12866 (58 FR 51735, October 4, 1993), this action is an "economically significant regulatory action" because it

is likely to have an annual effect on the economy of \$100 million or more. Accordingly, EPA submitted this action to the OMB for review under Executive Order 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

In addition, EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is contained in the RIA for this final rule. A copy of the analysis is available in the docket for this action and the analysis is briefly summarized in section VII of this preamble.

This rule uses a phased-in approach for requiring larger sources of GHG emissions to comply with title V operating permit and PSD statutory requirements, essentially lifting this burden for a period of at least 6 years for a large number of sources of GHG. Thus, this rule provides regulatory relief rather than regulatory requirements for these GHG sources. For sources of GHG that will be required to obtain title V permits and/or comply with PSD requirements, there are no direct economic burdens or costs as a result of this final rule, because these requirements are not imposed as a result of this rulemaking. Statutory requirements to obtain a title V operating permit or to adhere to PSD requirements are already mandated by the CAA and by existing rules, not by this rule. As a result, this Tailoring Rule annual effect on the economy will be positive because it will result in billions of dollars of regulatory relief during the phase-in period.

B. Paperwork Reduction Act

This action does not impose any new information collection burden. Instead, this action will significantly reduce costs incurred by sources and permitting authorities relative to the costs that would be incurred if EPA did not revise the rule. Based on our revised GHG threshold data analysis, we estimate that over 80,000 new and modified facilities per year would be subject to PSD review based on applying a GHG emissions threshold of 100/250 tpy using a CO₂e metric. This is compared to 280 PSD permits currently issued per year, which is an increase of more than 280-fold. Similarly, for title V, we estimate that over six million new sources would be affected at the 100-tpy threshold for GHGs using the CO₂e metric. By increasing the volume of permits by over 400 times, the administrative burden would be unmanageable without this rule.

However, OMB has previously approved the information collection

requirements contained in the existing regulations for PSD (*see, e.g.*, 40 CFR 52.21) and title V (*see* 40 CFR parts 70 and 71) under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2060-0003 and OMB control number 2060-0336. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the APA or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this final action on small entities, small entity is defined as: (1) A small business that is a small industrial entity as defined in the U.S. SBA size standards (*see* 13 CFR 121.201); (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; or (3) a small organization that is any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this final rule on small entities, I certify that this final action will not have a significant economic impact on a substantial number of small entities. In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant *adverse* economic impact on small entities, since the primary purpose of the regulatory flexibility analyses is to identify and address regulatory alternatives "which minimize any significant economic impact of the rule on small entities." 5 U.S.C. 603 and 604. Thus, an agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule.

We have therefore concluded that this final rule will relieve the regulatory burden for most affected small entities associated with the major PSD and title V operating permits programs for new or modified major sources that emit GHGs, including small businesses. This is because this rule raises the major source applicability thresholds for these

programs for the sources that emit GHGs. As a result, the program changes provided in this rule are not expected to result in a significant economic impact on a substantial number of small entities.

D. Unfunded Mandates Reform Act

This rule does not contain a federal mandate that may result in expenditures of \$100 million or more for state, local, and tribal governments, in the aggregate, or the private sector in any 1 year. Only those few states whose permitting authorities do not implement the federal PSD and title V rules by reference in their SIPs will have a small increase in burden. These states will have to amend their corresponding SIPs to incorporate the new applicability thresholds, since the burden reducing thresholds that we are finalizing with this rule will not otherwise apply to the PSD and title V programs. Thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. As discussed earlier, this rule is expected to result in cost savings and an administrative burden reduction for all permitting authorities and permittees, including small governments.

E. Executive Order 13132—Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. These final amendments will ultimately simplify and reduce the burden on state and local agencies associated with implementing the PSD and title V operating permits programs, by providing that a source whose GHG emissions are below the proposed levels will not have to obtain a PSD permit or title V permit. Thus, Executive Order 13132 does not apply to this action.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and state and local governments, EPA specifically solicited comment on the proposed rule from state and local officials.

F. Executive Order 13175—Consultation and Coordination With Indian Tribal Governments

Subject to the Executive Order 13175 (65 FR 67249, November 9, 2000) EPA may not issue a regulation that has tribal implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the federal government provides the funds necessary to pay the direct compliance costs incurred by tribal governments, or EPA consults with tribal officials early in the process of developing the proposed regulation and develops a tribal summary impact statement.

EPA has concluded that this action may have tribal implications. However, it will neither impose substantial direct compliance costs on tribal governments, nor preempt tribal law. There are no tribal authorities, currently issuing major NSR permits; however, this may change in the future.

EPA consulted with tribal officials early in the process of developing this regulation to allow them to have meaningful and timely input into its development by publishing an ANPR that included GHG tailoring options for regulating GHGs under the CAA. (73 FR 44354, July 30, 2008) As a result of the ANPR, EPA received several comments from tribal officials on differing GHG tailoring options presented in the ANPR which were considered in the proposal and this final rule. Additionally, we also specifically solicited comment from tribal officials on the proposed rule (74 FR 55292, October 27, 2009).

G. Executive Order 13045—Protection of Children From Environmental Health and Safety Risks

EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the Executive Order has the potential to influence the regulation. This action is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211—Actions That Significantly Affect Energy Supply, Distribution, or Use

This action is not a "significant energy action" as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, we have concluded that this rule is not likely to have any adverse energy effects

because this action would not create any new requirements for sources in the energy supply, distribution, or use sectors.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (“NTTAA”), Public Law No. 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This action does not involve technical standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

J. Executive Order 12898—Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has concluded that it is not practicable to determine whether there would be disproportionately high and adverse human health or environmental effects on minority and/or low income populations from this rule. This rule is necessary in order to allow for the continued implementation of permitting requirements established in the statute. Specifically, without this rule, the CAA permitting programs (PSD and title V) would become overwhelmed and unmanageable by the millions of GHG sources that would become newly subject to them. This would result in severe impairment of the functioning of these programs with potentially adverse human health and environmental effects nationwide. Under this rule and the legal doctrines of “absurd results,”

administrative necessity, and one-step-at-a-time, EPA is ensuring that the CAA permitting programs continue to operate by limiting their applicability to the maximum number of sources the programs can possibly handle. This approach is consistent with congressional intent as it allows PSD applicability to at least the largest sources initially, at least to as many more sources as possible, and as promptly as possible over time. By doing so, this rule allows for the maximum degree of environmental protection possible while providing regulatory relief for the unmanageable burden that would otherwise exist. Therefore, we believe it is not practicable to identify and address disproportionately high and adverse human health or environmental effects on minority populations and low income populations in the United States under this final rule.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by SBREFA, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is a “major rule” as defined by 5 U.S.C. 804(2). This rule will be effective August 2, 2010.

L. Judicial Review

Under section 307(b)(1) of the Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the District of Columbia Circuit by August 2, 2010. Any such judicial review is limited to only those objections that are raised with reasonable specificity in timely comments. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. Under section 307(b)(2) of the Act, the requirements of this final action may not be challenged later in civil or criminal proceedings brought by us to enforce these requirements. Pursuant to

section 307(d)(1)(V) of the Act, the Administrator determines that this action is subject to the provisions of section 307(d). Section 307(d)(1)(V) provides that the provisions of section 307(d) apply to “such other actions as the Administrator may determine.” This action finalizes some, but not all, elements of a previous proposed action—the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule Proposed Rule (74 FR 55292, October 27, 2009).

IX. Statutory Authority

The statutory authority for this action is provided by sections 307(d)(7)(B), 101, 111, 114, 116, and 301 of the CAA as amended (42 U.S.C. 7401, 7411, 7414, 7416, and 7601). This action is also subject to section 307(d) of the CAA (42 U.S.C. 7407(d)).

List of Subjects

40 CFR Part 51

Environmental protection, Administrative practice and procedure, Air pollution control, Carbon dioxide, Carbon dioxide equivalents, Greenhouse gases, Hydrofluorocarbons, Intergovernmental relations, Methane, Nitrous oxide, Perfluorocarbons, Reporting and recordkeeping requirements, Sulfur hexafluoride.

40 CFR Part 52

Environmental protection, Administrative practice and procedure, Air pollution control, Carbon dioxide, Carbon dioxide equivalents, Greenhouse gases, Hydrofluorocarbons, Intergovernmental relations, Methane, Nitrous oxide, Perfluorocarbons, Reporting and recordkeeping requirements, Sulfur hexafluoride.

40 CFR Part 70

Environmental protection, Administrative practice and procedure, Air pollution control, Carbon dioxide, Carbon dioxide equivalents, Greenhouse gases, Hydrofluorocarbons, Intergovernmental relations, Methane, Nitrous oxide, Perfluorocarbons, Reporting and recordkeeping requirements, Sulfur hexafluoride.

40 CFR Part 71

Environmental protection, Administrative practice and procedure, Air pollution control, Carbon dioxide, Carbon dioxide equivalents, Greenhouse gases, Hydrofluorocarbons, Methane, Nitrous oxide, Perfluorocarbons, Reporting and recordkeeping requirements, Sulfur hexafluoride.

Dated: May 13, 2010.

Lisa P. Jackson,
Administrator.

■ For reasons stated in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as set forth below.

PART 51—[AMENDED]

■ 1. The authority citation for part 51 continues to read as follows:

Authority: 23 U.S.C. 101; 42 U.S.C. 7401–7671q.

Subpart I—[Amended]

■ 2. Section 51.166 is amended:

- a. By adding paragraph (b)(48);
- b. By revising paragraph (b)(49)(iv); and
- c. By adding paragraph (b)(49)(v).

The revisions and additions read as follows:

§ 51.166 Prevention of significant deterioration of air quality.

* * * * *

(b) * * *

(48) *Subject to regulation* means, for any air pollutant, that the pollutant is subject to either a provision in the Clean Air Act, or a nationally-applicable regulation codified by the Administrator in subchapter C of this chapter, that requires actual control of the quantity of emissions of that pollutant, and that such a control requirement has taken effect and is operative to control, limit or restrict the quantity of emissions of that pollutant released from the regulated activity. Except that:

(i) *Greenhouse gases (GHGs)*, the air pollutant defined in § 86.1818–12(a) of this chapter as the aggregate group of six greenhouse gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, shall not be subject to regulation except as provided in paragraphs (b)(48)(iv) through (v) of this section.

(ii) For purposes of paragraphs (b)(48)(iii) through (v) of this section, the term *tpy CO₂ equivalent emissions (CO₂e)* shall represent an amount of GHGs emitted, and shall be computed as follows:

(a) Multiplying the mass amount of emissions (tpy), for each of the six greenhouse gases in the pollutant GHGs, by the gas's associated global warming potential published at Table A–1 to subpart A of part 98 of this chapter—Global Warming Potentials.

(b) Sum the resultant value from paragraph (b)(48)(ii)(a) of this section for each gas to compute a tpy CO₂e.

(iii) The term *emissions increase* as used in paragraphs (b)(48)(iv) through

(v) of this section shall mean that both a significant emissions increase (as calculated using the procedures in (a)(7)(iv) of this section) and a significant net emissions increase (as defined in paragraphs (b)(3) and (b)(23) of this section) occur. For the pollutant GHGs, an emissions increase shall be based on tpy CO₂e, and shall be calculated assuming the pollutant GHGs is a regulated NSR pollutant, and “significant” is defined as 75,000 tpy CO₂e instead of applying the value in paragraph (b)(23)(ii) of this section.

(iv) Beginning January 2, 2011, the pollutant GHGs is subject to regulation if:

(a) The stationary source is a new major stationary source for a regulated NSR pollutant that is not GHGs, and also will emit or will have the potential to emit 75,000 tpy CO₂e or more; or

(b) The stationary source is an existing major stationary source for a regulated NSR pollutant that is not GHGs, and also will have an emissions increase of a regulated NSR pollutant, and an emissions increase of 75,000 tpy CO₂e or more; and,

(v) Beginning July 1, 2011, in addition to the provisions in paragraph (b)(48)(iv) of this section, the pollutant GHGs shall also be subject to regulation:

(a) At a new stationary source that will emit or have the potential to emit 100,000 tpy CO₂e; or

(b) At an existing stationary source that emits or has the potential to emit 100,000 tpy CO₂e, when such stationary source undertakes a physical change or change in the method of operation that will result in an emissions increase of 75,000 tpy CO₂e or more.

(49) * * *

(iv) Any pollutant that otherwise is subject to regulation under the Act as defined in paragraph (b)(48) of this section.

(v) Notwithstanding paragraphs (b)(49)(i) through (iv) of this section, the term *regulated NSR pollutant* shall not include any or all hazardous air pollutants either listed in section 112 of the Act, or added to the list pursuant to section 112(b)(2) of the Act, and which have not been delisted pursuant to section 112(b)(3) of the Act, unless the listed hazardous air pollutant is also regulated as a constituent or precursor of a general pollutant listed under section 108 of the Act.

* * * * *

PART 52—[AMENDED]

■ 3. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart A—[Amended]

■ 4. Section 52.21 is amended:

- a. By adding paragraph (b)(49);
- b. By revising paragraph (b)(50)(iv); and

■ c. By adding paragraph (b)(50)(v).

The revisions and additions read as follows:

§ 52.21 Prevention of significant deterioration of air quality.

* * * * *

(b) * * *

(49) *Subject to regulation* means, for any air pollutant, that the pollutant is subject to either a provision in the Clean Air Act, or a nationally-applicable regulation codified by the Administrator in subchapter C of this chapter, that requires actual control of the quantity of emissions of that pollutant, and that such a control requirement has taken effect and is operative to control, limit or restrict the quantity of emissions of that pollutant released from the regulated activity. Except that:

(i) *Greenhouse gases (GHGs)*, the air pollutant defined in § 86.1818–12(a) of this chapter as the aggregate group of six greenhouse gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, shall not be subject to regulation except as provided in paragraphs (b)(49)(iv) through (v) of this section.

(ii) For purposes of paragraphs (b)(49)(iii) through (v) of this section, the term *tpy CO₂ equivalent emissions (CO₂e)* shall represent an amount of GHGs emitted, and shall be computed as follows:

(a) Multiplying the mass amount of emissions (tpy), for each of the six greenhouse gases in the pollutant GHGs, by the gas's associated global warming potential published at Table A–1 to subpart A of part 98 of this chapter—Global Warming Potentials.

(b) Sum the resultant value from paragraph (b)(49)(ii)(a) of this section for each gas to compute a tpy CO₂e.

(iii) The term *emissions increase* as used in paragraphs (b)(49)(iv) through (v) of this section shall mean that both a significant emissions increase (as calculated using the procedures in paragraph (a)(2)(iv) of this section) and a significant net emissions increase (as defined in paragraphs (b)(3) and (b)(23) of this section) occur. For the pollutant GHGs, an emissions increase shall be based on tpy CO₂e, and shall be calculated assuming the pollutant GHGs is a regulated NSR pollutant, and “significant” is defined as 75,000 tpy CO₂e instead of applying the value in paragraph (b)(23)(ii) of this section.

(iv) Beginning January 2, 2011, the pollutant GHGs is subject to regulation if:

(a) The stationary source is a new major stationary source for a regulated NSR pollutant that is not GHGs, and also will emit or will have the potential to emit 75,000 tpy CO₂e or more; or

(b) The stationary source is an existing major stationary source for a regulated NSR pollutant that is not GHGs, and also will have an emissions increase of a regulated NSR pollutant, and an emissions increase of 75,000 tpy CO₂e or more; and,

(v) Beginning July 1, 2011, in addition to the provisions in paragraph (b)(49)(iv) of this section, the pollutant GHGs shall also be subject to regulation

(a) At a new stationary source that will emit or have the potential to emit 100,000 tpy CO₂e; or

(b) At an existing stationary source that emits or has the potential to emit 100,000 tpy CO₂e, when such stationary source undertakes a physical change or change in the method of operation that will result in an emissions increase of 75,000 tpy CO₂e or more.

(50) * * *

(iv) Any pollutant that otherwise is subject to regulation under the Act as defined in paragraph (b)(49) of this section.

(v) Notwithstanding paragraphs (b)(50)(i) through (iv) of this section, the term *regulated NSR pollutant* shall not include any or all hazardous air pollutants either listed in section 112 of the Act, or added to the list pursuant to section 112(b)(2) of the Act, and which have not been delisted pursuant to section 112(b)(3) of the Act, unless the listed hazardous air pollutant is also regulated as a constituent or precursor of a general pollutant listed under section 108 of the Act.

* * * * *

■ 5. A new § 52.22 is added to read as follows:

§ 52.22 Enforceable commitments for further actions addressing the pollutant greenhouse gases (GHGs).

(a) Definitions.

(1) *Greenhouse Gases (GHGs)* means the air pollutant as defined in § 86.1818–12(a) of this chapter as the aggregate group of six greenhouse gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

(2) All other terms used in this section shall have the meaning given in § 52.21.

(b) *Further action to regulate GHGs under the PSD program.*

(1) *Near term action on GHGs.* The Administrator shall solicit comment,

under section 307(b) of the Act, on promulgating lower GHGs thresholds for PSD applicability. Such action shall be finalized by July 1, 2012 and become effective July 1, 2013.

(2) *Further study and action on GHGs.*

(i) No later than April 30, 2015 the Administrator shall complete a study projecting the administrative burdens that remain with respect to stationary sources for which GHGs do not constitute a regulated NSR pollutant. Such study shall account, among other things, for permitting authorities ability to secure resources, hire and train staff; experiences associated with GHG permitting for new types of sources and technologies; and, the success of streamlining measures developed by EPA (and adopted by the states) for reducing the permitting burden associated with such stationary sources.

(ii) Based on the results of the study described in paragraph (b)(2)(i) of this section, the Administrator shall propose a rule addressing the permitting obligations of such stationary sources under § 52.21 and § 51.166 of this chapter. The Administrator shall take final action on such a rule no later than April 30, 2016.

(iii) Before completing the rule described in paragraph (b)(2)(ii) of this section, the Administrator shall take no action to make the pollutant GHGs subject to regulation at stationary sources that emit or have the potential to emit less than 50,000 tpy CO₂e, or for physical changes or changes in the method of operations at stationary sources that result in an emissions increase of less than 50,000 tpy CO₂e (as determined using the methodology described in § 52.21(b)(49)(ii).)

PART 70—[AMENDED]

■ 6. The authority citation for part 70 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

■ 7. Section 70.2 is amended:

■ a. By revising the introductory text of paragraph (2) of the definition for “major source”; and

■ b. By adding a definition for “Subject to regulation” in alphabetical order.

The revision and addition read as follows:

§ 70.2 Definitions.

* * * * *

Major source * * *

(2) A major stationary source of air pollutants, as defined in section 302 of the Act, that directly emits, or has the potential to emit, 100 tpy or more of any air pollutant subject to regulation (including any major source of fugitive emissions of any such pollutant, as

determined by rule by the Administrator). The fugitive emissions of a stationary source shall not be considered in determining whether it is a major stationary source for the purposes of section 302(j) of the Act, unless the source belongs to one of the following categories of stationary source:

* * * * *

Subject to regulation means, for any air pollutant, that the pollutant is subject to either a provision in the Clean Air Act, or a nationally-applicable regulation codified by the Administrator in subchapter C of this chapter, that requires actual control of the quantity of emissions of that pollutant, and that such a control requirement has taken effect and is operative to control, limit or restrict the quantity of emissions of that pollutant released from the regulated activity. Except that:

(1) *Greenhouse gases (GHGs)*, the air pollutant defined in § 86.1818–12(a) of this chapter as the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, shall not be subject to regulation unless, as of July 1, 2011, the GHG emissions are at a stationary source emitting or having the potential to emit 100,000 tpy CO₂ equivalent emissions.

(2) The term *tpy CO₂ equivalent emissions (CO₂e)* shall represent an amount of GHGs emitted, and shall be computed by multiplying the mass amount of emissions (tpy), for each of the six greenhouse gases in the pollutant GHGs, by the gas’s associated global warming potential published at Table A–1 to subpart A of part 98 of this chapter—Global Warming Potentials, and summing the resultant value for each to compute a tpy CO₂e.

* * * * *

■ 8. A new § 70.12 is added to read as follows:

§ 70.12 Enforceable commitments for further actions addressing greenhouse gases (GHGs).

(a) Definitions.

(1) *Greenhouse Gases (GHGs)* means the air pollutant as defined in § 86.1818–12(a) of this chapter as the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

(2) All other terms used in this section shall have the meaning given in § 70.2.

(b) *Further action to regulate GHGs under the title V program.*

(1) *Near term action on GHGs.* The Administrator shall solicit comment,

under section 307(b) of the Act, on promulgating lower GHGs thresholds for applicability under § 70.2. Such action shall be finalized by July 1, 2012 and become effective July 1, 2013.

(2) *Further study and action on GHGs.*

(i) No later than April 30, 2015 the Administrator shall complete a study projecting the administrative burdens that remain with respect to stationary sources for which GHGs do not constitute a pollutant subject to regulation. Such study shall account, among other things, for permitting authorities ability to secure resources, hire and train staff; experiences associated with GHG permitting for new types of sources and technologies; and, the success of streamlining measures developed by EPA (and adopted by the states) for reducing the permitting burden associated with such stationary sources.

(ii) Based on the results of the study described in paragraph (b)(2)(i) of this section, the Administrator shall propose a rule addressing the permitting obligations of such stationary sources under § 70.2. The Administrator shall take final action on such a rule no later than April 30, 2016.

(iii) Before completing the rule described in paragraph (b)(2)(ii) of this section, the Administrator shall take no action to make the pollutant GHGs subject to regulation at stationary sources that emit or have the potential to emit less than 50,000 tpy CO₂e (as determined using the methodology described in § 70.2.)

PART 71—[AMENDED]

■ 9. The authority citation for part 71 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart A—[AMENDED]

■ 10. Section 71.2 is amended:

■ a. By revising the introductory text of paragraph (2) of the definition for “major source”; and

■ b. By adding a definition for “Subject to regulation” in alphabetical order.

The revision and addition read as follows:

§ 71.2 Definitions.

* * * * *

Major source * * *

(2) A major stationary source of air pollutants, as defined in section 302 of the Act, that directly emits or has the potential to emit, 100 tpy or more of any air pollutant subject to regulation (including any major source of fugitive emissions of any such pollutant, as determined by rule by the Administrator). The fugitive emissions of a stationary source shall not be considered in determining whether it is a major stationary source for the purposes of section 302(j) of the Act, unless the source belongs to one of the following categories of stationary source:

* * * * *

Subject to regulation means, for any air pollutant, that the pollutant is subject to either a provision in the Clean Air Act, or a nationally-applicable regulation codified by the Administrator in subchapter C of this chapter, that requires actual control of the quantity of emissions of that pollutant, and that such a control requirement has taken effect and is operative to control, limit or restrict the quantity of emissions of that pollutant released from the regulated activity. Except that:

(1) *Greenhouse gases (GHGs)*, the air pollutant defined in § 86.1818–12(a) of this chapter as the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, shall not be subject to regulation unless, as of July 1, 2011, the GHG emissions are at a stationary source emitting or having the potential to emit 100,000 tpy CO₂ equivalent emissions.

(2) The term *tpy CO₂ equivalent emissions (CO₂e)* shall represent an amount of GHGs emitted, and shall be computed by multiplying the mass amount of emissions (tpy), for each of the six greenhouse gases in the pollutant GHGs, by the gas's associated global warming potential published at Table A–1 to subpart A of part 98 of this chapter—Global Warming Potentials, and summing the resultant value for each to compute a tpy CO₂e.

■ 11. A new § 71.13 is added to subpart A to read as follows:

§ 71.13 Enforceable commitments for further actions addressing Greenhouse Gases (GHGs)

(a) *Definitions.*

(1) *Greenhouse Gases (GHGs)* means the air pollutant as defined in § 86.1818–12(a) of this chapter as the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

(2) All other terms used in this section shall have the meaning given in § 71.2.

(b) *Further action to regulate GHGs under the title V program.*

(1) *Near term action on GHGs.* The Administrator shall solicit comment, under section 307(b) of the Act, on promulgating lower GHGs thresholds for applicability under § 71.2. Such action shall be finalized by July 1, 2012 and become effective July 1, 2013.

(2) *Further study and action on GHGs.*

(i) No later than April 30, 2015, the Administrator shall complete a study projecting the administrative burdens that remain with respect to stationary sources for which GHGs do not constitute a pollutant subject to regulation. Such study shall account, among other things, for permitting authorities ability to secure resources, hire and train staff; experiences associated with GHG permitting for new types of sources and technologies; and, the success of streamlining measures developed by EPA (and adopted by the states) for reducing the permitting burden associated with such stationary sources.

(ii) Based on the results of the study described in paragraph (b)(2)(i) of this section, the Administrator shall propose a rule addressing the permitting obligations of such stationary sources under § 71.2. The Administrator shall take final action on such a rule no later than April 30, 2016.

(iii) Before completing the rule described in paragraph (b)(2)(ii) of this section, the Administrator shall take no action to make the pollutant GHGs subject to regulation at stationary sources that emit or have the potential to emit less than 50,000 tpy CO₂e, (as determined using the methodology described in § 71.2.)

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