

# Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants, Creating Clean Energy Jobs, Improving Americans' Health, and Curbing Climate Change

**O**n the night he was re-elected, President Obama told the nation that he wants "our children to live in an America...that isn't threatened by the destructive power of a warming planet." In his first post-election press conference the President defined how by saying, **"we can shape an agenda that says we can create jobs, advance growth and make a serious dent in climate change and be an international leader."**

We agree. Climate and energy experts at the Natural Resources Defense Council have crafted a groundbreaking proposal to do just that.

This administration can create jobs, grow the economy, and curb climate change by going after the country's largest source of climate-changing pollution—emissions from the hundreds of existing power plants. NRDC's proposal shows how the Environmental Protection Agency, in partnership with the states, can set new carbon pollution standards under existing authority in the Clean Air Act that will cut existing power plant emissions 26 percent by 2020 (relative to peak emissions in 2005). The approach includes an innovative provision that will drive investment in cost-effective energy efficiency, substantially lowering the cost of compliance, lowering electricity bills, and creating thousands of jobs across the country. Further, NRDC's analysis shows that the benefits—in saved lives, reduced illnesses and climate change avoided—far outweigh the costs, by as much as 15 times.

Having endured a year when climate change contributed to damaging floods, widespread wildfires, record drought and superstorm Sandy, which cost Americans hundreds of lives and hundreds of billions of dollars, we can't afford to wait any longer to act. For the health and welfare of Americans, for the nation's economy, and for the stability of the planet, now is the time to reduce pollution from America's power plants, dramatically increase the energy efficiency of our economy and reduce the threat of climate change.

We know where the pollution is; now we just have to go get it.

## THE IMPERATIVE TO CUT CARBON POLLUTION

Unless heat-trapping carbon pollution is sharply reduced, negative impacts on the health of our families, communities, economy and our planet will only grow.

Already, climate change is increasing the numbers of record heat waves, droughts, and floods—and these extreme weather events will become even more powerful and frequent, threatening both lives and the global economy. In the wake of superstorm Sandy, which devastated swaths of the U.S. coastline, states and cities must rebuild for this new reality. But simply preparing for more extreme weather is not an answer by itself. Future storms will be stronger and do even worse damage unless we act now to curb the carbon pollution that is driving dangerous climate change.

To this end, nothing is more important than reducing carbon dioxide (CO<sub>2</sub>) emissions from the largest industrial source of pollution: electricity-generating power plants. In the United States these plants emit about 2.4 billion tons of CO<sub>2</sub> each year, roughly 40 percent of the nation's total emissions.

To be sure, the EPA has taken important first steps by setting standards that will cut the carbon pollution from automobiles and trucks nearly in half by 2025 and by proposing standards to limit the carbon pollution from new power plants. But the EPA has yet to tackle the CO<sub>2</sub> pollution from hundreds of *existing* fossil-fueled power plants in the United States.

The EPA has both the authority and responsibility to reduce pollution from these plants under the Clean Air Act, the nation's bedrock air pollution law adopted in 1970. NRDC has crafted an effective and flexible approach to cut carbon pollution from existing power plants that:

- Uses the legal authority under the Clean Air Act.
- Recognizes differences in the starting points among states.
- Charts a path to affordable and effective emissions reductions by tapping into the ingenuity of the states and the private sector.
- Provides multiple compliance options, including cleaning up existing power plants, shifting power generation to plants with lower emissions or none at all, and improving the efficiency of electricity use.

Using the same sophisticated integrated planning model used by the industry and the EPA, NRDC calculated the pollution reductions that would result from the proposed approach—and the costs and benefits of achieving those reductions.

The plan would cut CO<sub>2</sub> pollution from America's power plants by 26 percent from 2005 levels by 2020 and 34 percent by 2025. The price tag: about \$4 billion in 2020. But the benefits—in saved lives, reduced illnesses, and climate change avoided—would be \$25 billion to 60 billion, 6 to 15 times greater than the costs. For Americans' health and welfare, for the nation's economy, and for the health of the planet, we can't afford *not* to curb the carbon pollution from existing power plants.

## EPA HAS THE LEGAL AUTHORITY AND OBLIGATION TO REDUCE CARBON POLLUTION

The Clean Air Act has been remarkably successful over its 40-year history. Most Americans now breathe much cleaner air, our cities are no longer enveloped in smoke and smog, the nation's lakes and rivers are recovering from acid rain, and the ozone layer that shields us from dangerous ultraviolet radiation is healing after the phase-out of CFCs and other ozone-destroying chemicals.

The Clean Air Act can also help stem the threat of climate change by reducing carbon pollution. In 2007, in *Massachusetts v. EPA*, the U.S. Supreme Court ruled that the EPA has the authority and responsibility to curb heat-trapping pollutants under the Clean Air Act, rejecting the Bush Administration's claim that greenhouse gases are not pollutants under that law. In that case, the nation's highest court ruled that if the science shows CO<sub>2</sub> and other heat-trapping pollutants endanger public health and welfare, then the EPA must set standards to reduce their emissions from new cars and trucks.

In President Obama's first term, the EPA responded to the Supreme Court decision by presenting overwhelming scientific evidence that CO<sub>2</sub> and the other heat-trapping pollutants do indeed endanger public health and welfare. The administration then set new standards in 2010 and 2012 to dramatically cut the carbon pollution from new cars and SUVs and from heavy trucks and buses.

In a second Supreme Court decision in 2011, *American Electric Power v. Connecticut*, the high court ruled that it is also the EPA's responsibility to curb the carbon pollution from the nation's power plants. The legal authority for power plant standards comes from Section 111 of the Clean Air Act, which directs the EPA to set "standards of performance" (typically a maximum emissions rate) for stationary sources like power plants that emit harmful air pollutants. Section 111(b) covers new facilities, while Section 111(d) gives the EPA and states shared responsibility for curbing pollution from existing facilities. Under Section 111(d), the EPA issues guidelines on "the best system of emission reduction," and then each state is required to adopt and submit a plan for setting and meeting emissions standards.

In April 2012, the agency took the first step toward addressing power plant pollution by proposing the "Carbon Pollution Standard for New Power Plants" under Section 111(b). The standard would require that new plants emit no more than 1000 pounds of CO<sub>2</sub> per megawatt-hour (lbs/MWh). To put that in context, coal power plants typically produce about 2100 lbs/MWh, while natural gas-fired plants emit 1000/MWh or less. Power companies building new facilities could thus meet the standard with existing natural gas power plant technologies, zero-emitting renewables, or with efficient coal plants equipped with systems to capture and sequester carbon dioxide.

The EPA's assessment, widely shared in the private sector, is that even without the proposed carbon pollution standard new power supply needs will be met by a combination of natural gas, renewables, energy efficiency, and other resources because the construction of new conventional coal-fired power plants is uneconomic. The new source standard is expected to be finalized in the next few months.

EPA, however, still hasn't addressed the largest source of carbon pollution, *existing* power plants. NRDC's approach addresses the challenge of creating equitable regulations for these sources under Section 111(d), recognizing that the type and mix of power plants varies among the states. If all existing power plants were limited to 1000 lbs of CO<sub>2</sub>/MWh, for instance, states with a high percentage of coal-fired plants would face a much larger task compared to those with lots of natural gas plants or renewables. The flexible approach NRDC proposes will help reduce the carbon pollution from existing power plants in a fair, affordable, and achievable manner.

## STATE-SPECIFIC STANDARDS AND FLEXIBLE COMPLIANCE OPTIONS

The NRDC plan has two key elements:

(1) EPA would set state-specific emissions rates, reflecting the diversity of the nation's electricity sector, as well as the state-by-state structure of Section 111(d).

(2) Power plant owners and states would have broad flexibility to meet standards in the most cost-effective way, through a range of technologies and measures.

Here's how it would work: the EPA would first tally up the share of electricity generated by coal and gas-fired plants in each state during the baseline years (2008-2010 was used for this analysis). Then the agency would set a target emission rate for each state for 2020, based on the state's baseline share of coal and gas generation. The state standards proposed and analyzed in this report were calculated by applying a rate of 1500 lbs of CO<sub>2</sub>/MWh for the baseline coal generation share and 1000 lbs of CO<sub>2</sub>/MWh for the baseline gas-fired generation share.

For example, a state that now gets 90 percent of its fossil-fueled electricity from coal and 10 percent from gas would be required to reduce its 2020 emissions rate to 1450 lbs/MWh [(90 percent x 1500) + (10 percent x 1000)]. In contrast, a state with 90 percent gas-fired generation would have a target of 1050 lbs/MWh [(10 percent x 1500) + (90 percent x 1000)]. A state starting with a 50:50 ratio of coal and gas generation would have a target of 1250 lbs/MWh. The allowable emissions rate would drop further in 2025.

The emissions standard for each state would be an overall emission rate average of all fossil fuel plants in the state. An individual plant could emit at a higher or lower rate.

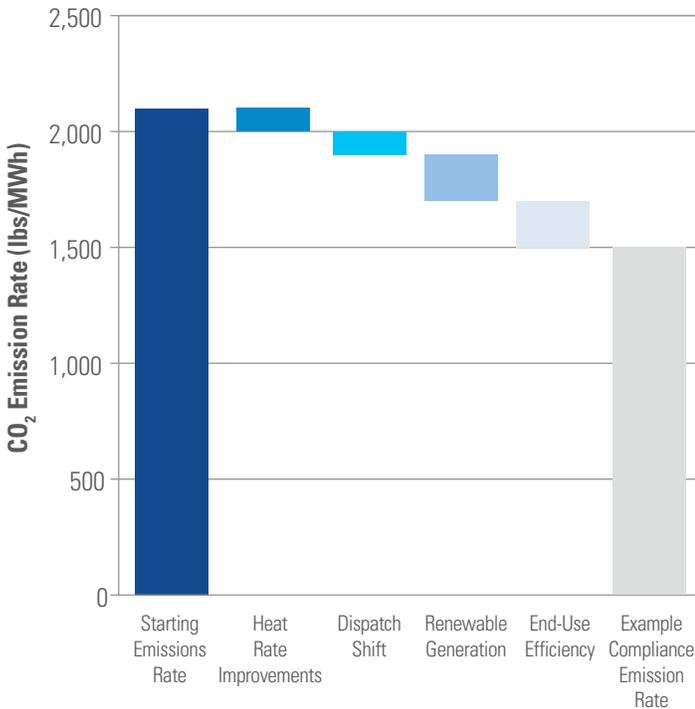
Each covered plant with an emission rate above the state standard could meet the standard by using one or more compliance options: First, a plant could reduce its own CO<sub>2</sub> emission rate by retrofitting a more efficient boiler or installing CO<sub>2</sub> capture systems, for instance, or it could burn a mixture of coal and cleaner fuels, such as gas or certain types of biomass.

Second, the owners of multiple power plants could average the emissions rates of their plants, meeting the required emission rate on average by running coal plants less often, and ramping up generation from natural gas plants or renewable sources instead. They could retire coal plants and build new natural gas and renewable capacity, if needed, creating a cleaner overall electricity-generating fleet. Low- or zero-emitting sources, such as wind and solar, would earn credits that generators could use to lower their average emissions rate. The plan also allows trading of credits between companies within a state, and across state lines among states that choose to allow it, further lowering the overall costs of compliance.

An innovative feature of the proposal is the inclusion of energy efficiency. State-regulated energy efficiency programs could earn credits for avoided power generation, and avoided pollution. Generators could purchase and use those credits towards their emissions compliance obligations, effectively lowering their calculated average emissions rate. Energy efficiency is one of the lowest cost energy resources and emission reduction options. States could use this provision to slash emissions without costly and lengthy power plant retrofits or new construction, reducing the overall cost of the regulations.



**Figure 1: Generator Compliance: Illustrative Example**



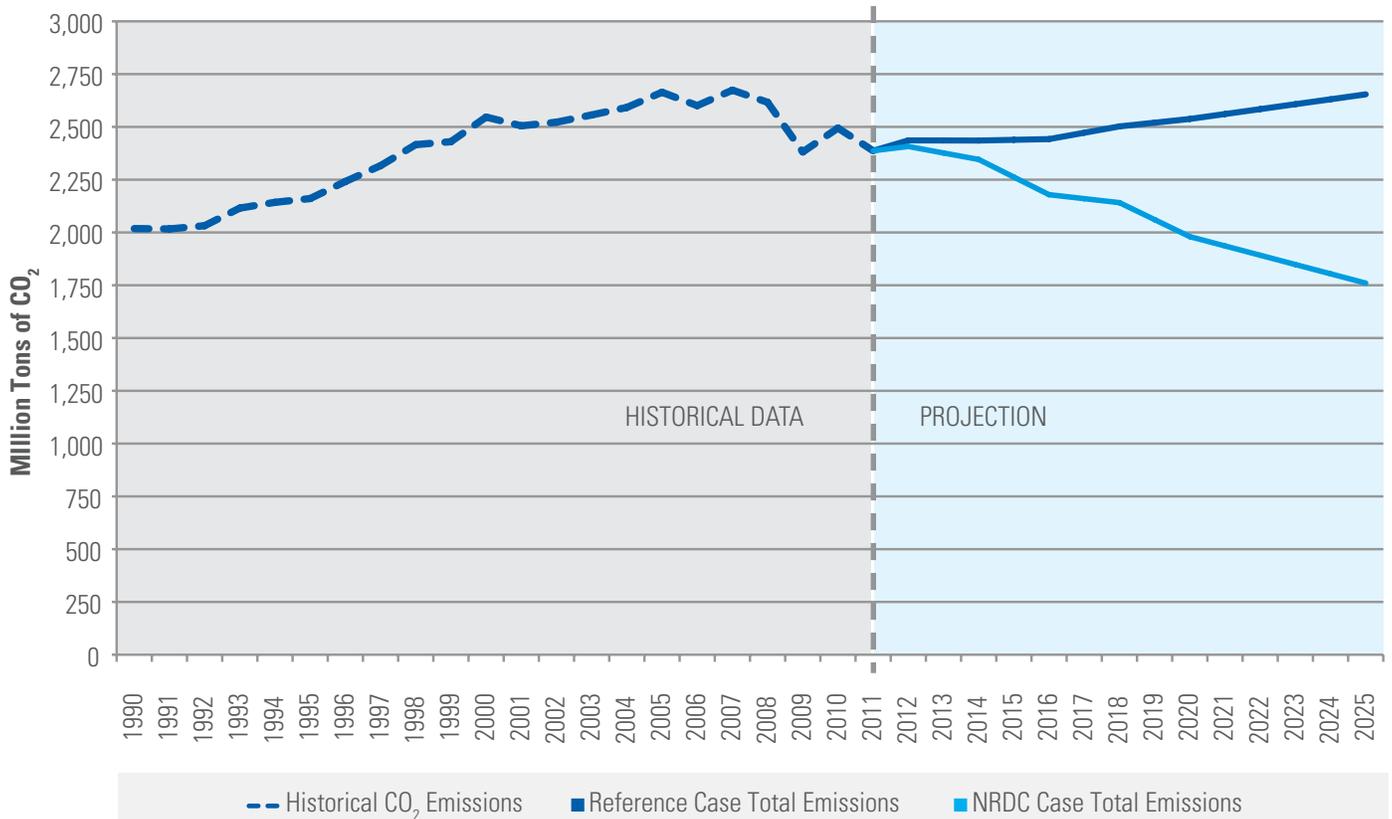
Improving energy efficiency also cuts costs to consumers and businesses. Switching to more efficient light bulbs, adding weather-stripping or insulation in buildings, or installing more efficient appliances and equipment, for example, can save a typical household more than \$700 per year—about one-third of the \$2,200 average annual utility bill.

Energy efficiency programs should include rigorous requirements to ensure that credited reductions in electricity use are real and verifiable. These requirements are addressed in the proposal.

The range of compliance options enables a 26 percent reduction in emissions of climate-change-causing CO<sub>2</sub> emissions from existing power plants by 2020 compared to 2005 levels (or equivalently, a 17 percent reduction compared to 2011 levels; see Figure 1: Generator Compliance: Illustrative Example; and Figure 2: Power Sector CO<sub>2</sub> Emissions Projections (Million Short Tons)).

States would have additional options. They could follow the EPA model program. They also would have the freedom to adopt alternative approaches—such as those already implemented in California and the Northeast States (through the Regional Greenhouse Gas Initiative)—as long as the states demonstrate those approaches will achieve equal or lower emissions.

**Figure 2: Power Sector CO<sub>2</sub> Emissions Projections (Million Short Tons)**



## THE BENEFITS OF IMPLEMENTING THE PROPOSAL

NRDC asked ICF International to analyze the proposed approach using the company's proprietary Integrated Planning Model (IPM®). Used routinely by both the utility industry and regulators to determine cost-effective ways of meeting the nation's electricity needs and to assess the effects of regulations, the IPM® models the entire electric power sector. It integrates extensive information on power generation, fuel mix, transmission, energy demand, prices of electricity and fuel, environmental policies, and other factors.

For this analysis, NRDC made a series of conservative assumptions about fuel prices, energy demand, and policies to plug into the IPM®—and also assumed that new EPA rules limiting emissions of mercury, air toxics and further reducing sulfur dioxide and nitrogen oxides would be implemented.

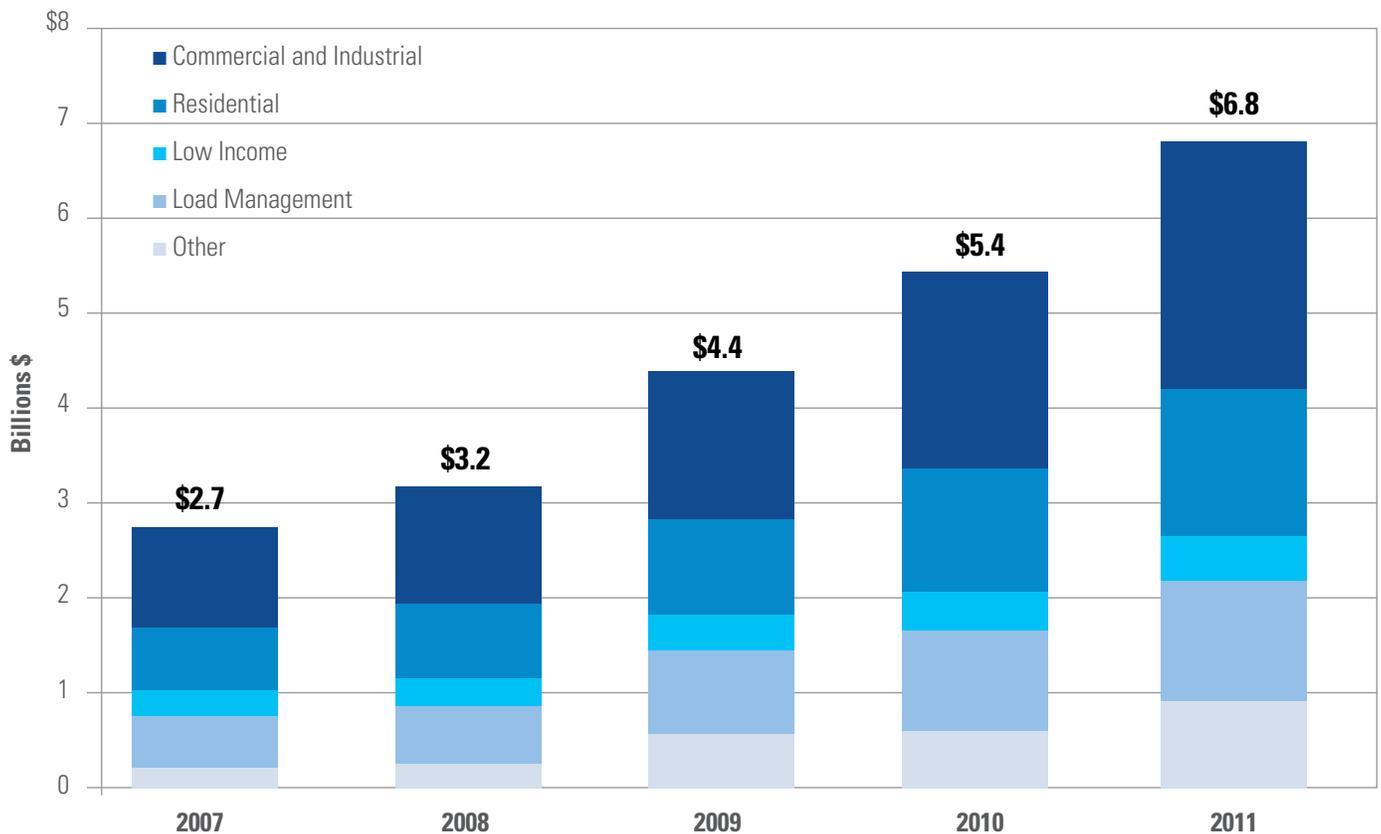
### Modernizing the Electricity Sector

The results from the model show that the proposed approach would begin to modernize and clean up America's electricity sector while modestly *reducing* the nation's electricity bill. This is because energy efficiency programs adopted in response to the incentives created by the approach would cause overall demand to decline by 4 percent, rather than

increase by 7 percent. Meanwhile, coal-fired generation would drop 21 percent from 2012 to 2020 instead of increasing by 5 percent without the proposed carbon standard. Natural gas generation would rise by 14 percent, while renewables rise by about 30 percent (assuming no new state or federal policies to expedite an increase in market share for renewables).

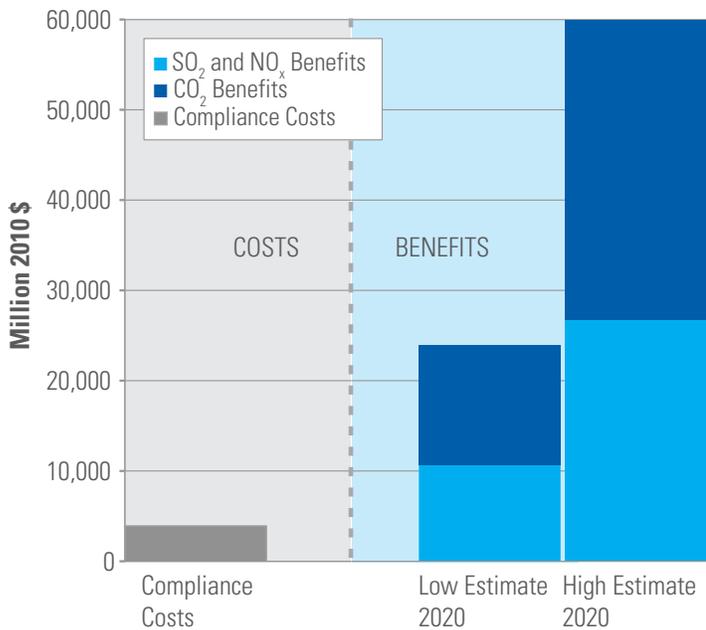
Investments in energy efficiency and demand response are the lowest cost compliance pathway—much cheaper than building new power plants or installing pollution control equipment—so including this flexibility significantly reduces overall costs. Energy efficiency consistently delivers over three dollars in savings for every dollar invested, which is one of the many reasons utilities have scaled up annual investment from \$2.7 billion in 2007 to nearly \$7 billion in 2011, with a corresponding increase in energy savings. See Figure 3: U.S. Electric Efficiency Program Investments, 2007-2011. Efficiency investments reduce the need to build additional power plants and infrastructure, reduce wholesale power prices, and deliver significant bill savings to individuals and businesses. Because substantial reductions in CO<sub>2</sub> can be achieved through energy efficiency without building many new power plants or installing lots of expensive pollution control equipment, the total costs of compliance would be low—netting out at \$4 billion in 2020.

**Figure 3: U.S. Electric Efficiency Program Investments, 2007-2011**



Source: CEE, 2011 State of the Efficiency Program Industry.

**Figure 4: Estimated Costs and Benefits From Reductions in SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> (2020)**



### Health and Environmental Benefits

The benefits of the proposal far outweigh the costs. Carbon dioxide from power plants contributes to the severity of heat waves, droughts, floods and rising sea levels, all of which bring an enormous toll in human lives, devastation and economic disruption. The value of reducing carbon pollution is estimated at \$25 to \$59 per ton, or more.

The proposal also brings cuts in emissions of traditional pollutants like sulfur and nitrogen oxides spewing from power plants beyond what current regulations would achieve. The emissions reductions delivered by implementing the proposal would prevent more than 23,000 asthma attacks, avoid more than 2,300 emergency room visits and hospital admissions per year and prevent thousands of premature deaths.

The benefits of reducing CO<sub>2</sub> and the traditional pollutants are both substantial, and add up to \$25 to \$60 billion. That's 6 to 15 times higher than the costs of complying with the proposal (see Figure 4: Estimated Costs and Benefits From Reductions in SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> (2020)).

What's more, this approach would stimulate investments of more than \$90 billion in energy efficiency and renewables between now and 2020, boosting local and state economies. Establishing such CO<sub>2</sub> emission standards now will give the power industry the investment certainty it needs to avoid billions of dollars of stranded investment in obsolete power plants.



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