

## COUNTING THE BENEFITS OF CUTTING CARBON POLLUTION

### QUESTIONS AND ANSWERS ON THE “SOCIAL COST OF CARBON”

Climate-change deniers have a new bogeyman: the “social cost of carbon.” It’s their latest gambit for trying to block the President’s Climate Change Action Plan.

They and their fossil-fuel allies will do or say anything to stand in the way of the president’s plan to protect us, and our children and grandchildren, from the dangers of carbon pollution.

The “social cost of carbon” is the Obama administration’s estimate of the economic costs of the damages caused by carbon pollution – of the dollar value of reducing that pollution.

House Republicans are outraged. They don’t want us to know the costs carbon pollution imposes on our families and the economy. They’ve already passed a bill to block agencies from considering the “social cost of carbon” when setting clean air and energy efficiency standards. Senate Republicans are threatening to offer a similar bill.

If these bills passed, EPA and other agencies would be forced to treat the benefits of any new carbon pollution or energy efficiency standards as “zero.” But as one federal court has found, “the value of carbon emissions reduction is certainly not zero.”

These bills are just another way for Republican legislators to deny the science. That makes no sense. The costs of climate change are real. And the benefits of curbing carbon pollution are real.

The costs of carbon pollution, and the benefits of standards to curb that pollution, cannot be denied any longer.

*Sticking your head in the sand is dangerous, especially when sea levels are rising.*



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## HERE ARE QUESTIONS AND ANSWERS ON THE SOCIAL COST OF CARBON

### WHAT IS THE “SOCIAL COST OF CARBON”?

Carbon pollution drives climate changes that hurt public health, fuel extreme weather, punish agriculture, eat away our coastlines, and more.

The “social cost of carbon” is economists’ best estimate of how much it’s worth to reduce each ton of carbon dioxide emissions – of how much economic benefit society gains from preventing each ton of carbon pollution.

Using the best peer-reviewed science, economists work to put price tags on these damages. They can put dollar values on some – but not all – of these impacts. And on some – but not all – of the benefits we reap by avoiding these harms.

The economists publish their estimates in peer-reviewed studies in the open economics literature.

When EPA and other agencies set clean air standards or energy efficiency standards, it’s important to know how much benefit we’re getting, and how that compares to the cost of those standards.

So a panel of government economists from 12 federal agencies drew from the peer-reviewed economics studies and compiled an estimate of the dollar value of curbing carbon pollution.<sup>1</sup>

This is the official figure called the “social cost of carbon.” It really should be called “the benefits of curbing carbon pollution.”

### OK, WHAT IS THE CURRENT ESTIMATE OF THE SOCIAL COST OF CARBON?

The government’s official estimate is that each ton of CO<sub>2</sub> pollution avoided in 2010 brought us \$33 in benefits – in health, environmental, and economic damages we’ll avoid.

And because climate change damages are getting worse, scientists and economists tell us the benefits of curbing carbon pollution go up over time. The government’s official estimate is that avoiding a ton of CO<sub>2</sub> emissions in 2015 will be worth \$38. In 2020, it’ll be worth \$43. In 2025, \$48. And so forth, so that in 2050, it’ll be worth \$71.

## WHAT IS A TON OF CARBON POLLUTION?

To give an idea, it's the amount of CO<sub>2</sub> a typical family car emits in about two-and-a-half months. Our power plants emit 2.2 *billion* tons across the U.S. each year.

## WHY CALCULATE BENEFITS ANYWAY?

Every president since Richard Nixon has sought information on the costs and benefits of federal standards and regulations.

Presidential Executive Orders since 1981 have required that, where it's allowed by law, each agency proposing a federal standard or regulation must estimate the measure's costs and benefits – how much it will cost to comply with, and how much it will benefit the public. These cost-benefit analyses are reviewed by the White House Office of Management and Budget.

Economists will be the first to admit that they can't quantify all the important impacts on health or the environment, and that they can't put a dollar value on everything that's important.

But even incomplete benefits assessments often show that health and environmental standards yield far more in benefits than they cost. Clean Air Act standards, for example, can yield benefit-cost ratios of up to 30-to-1.

## IS THE BENEFITS ESTIMATE COMPLETE?

No. As noted above, it covers only *some* of the impacts of climate change, and even for these the dollar values are incomplete.

It *includes* estimates of some impacts on human health, property damages from increased flood risk, net energy costs (e.g., higher air conditioning or lower heating bills), ecosystem services lost due to climate change, and net agricultural productivity.<sup>2</sup> Many of these categories of damages are only partially represented.

It *excludes* broad categories of climate change impacts, e.g., forest fires, drought, effects of temperature extremes on crops, increasing food prices, effects of drought on energy and water supplies, the possibility of conflict (including war) over water shortages and food scarcity, the consequences of total ecosystem losses, the impacts of air pollution from enhanced smog, as well as catastrophic events (e.g. 20-foot sea level rise from a major ice sheet collapse). Economists may not yet have put dollar values on these categories of impacts, but that does not make them any less real.

As a result, these estimates of the benefits of curbing carbon pollution err substantially on the low side.

## WHAT ABOUT THE DISCOUNT RATE?

Each ton of carbon pollution released into the air stays there for centuries. It traps heat and fuels climate change year after year, affecting not only our lives now, but also our children's and grandchildren's.

Economists have a tough time accounting for damages imposed on future generations. Normally they *discount* harms that take place in the future, because we all tend (at least in our own lives) to put greater weight on good things or bad things that occur today over the same good things or bad things taking place a few years from now. To reflect our preference for today, economists typically use a *discount rate* of 3% or more – meaning that the benefit of avoiding \$100 in damage years from now is treated as a much smaller benefit today.

Profound ethical problems arise when the harms from our pollution fall not on us, but on the next generations. Carry discounting far enough into the future, and huge harms occurring then are worth only a pittance today.

That's led some economists to argue against discounting the future benefits of curbing today's carbon pollution – or at least for using a much smaller discount rate.

The discount rate chosen really matters. Emitting carbon pollution today that imposes \$100 of future damages on your kids 50 years from now counts as only \$23 today when discounted at 3 percent. The same damages discounted at 1 percent count as \$61 today – nearly three times as much.

Carry these calculations out 100 years, when our grandchildren will be still in their prime, and the same \$100 in damages counts as only \$5 today if discounted at 3 percent, or as \$37 if discounted at 1 percent.

The values from the interagency panel report quoted above – e.g., \$33/ton in 2010 – reflect discounting at 3 percent. Discounted at 1 percent, that would jump to hundreds of dollars per ton, and call for even stronger action now.

In the end, the discounting question comes down to whether we really want to leave our children and grandchildren holding the bag? Or whether we are willing to curb carbon pollution now to protect them, as well as ourselves?

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## SO, WHAT ABOUT THE CRITICS' CHARGES?

### **WAS THE GOVERNMENT'S ESTIMATE OF CARBON CONTROL BENEFITS DEVELOPED IN SECRET?**

Just the opposite. Let's review how we got here.

In 2006, the Bush administration's Transportation Department acknowledged that new fuel economy standards would cut millions of tons of CO<sub>2</sub> and would reduce climate change impacts. But DOT said the economic benefits of those reductions were too uncertain to estimate. So the agency pegged the dollar value of these carbon reductions at *zero*.

A U.S. Court of Appeals reversed, saying "while the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero."<sup>3</sup>

When DOT and EPA set new fuel

economy and clean car standards in 2010, the Obama administration put together a 12-agency task force to take a fresh look at the economic benefits of curbing carbon pollution.

The task force published its report in 2010, and put it into the public docket at DOT and EPA. The public had a full opportunity to comment on the methodology, the underlying studies, and the results. Many comments were filed and DOT and EPA responded to each one.

Though many parties challenged the vehicle standards in court, *no one* raised any question about the "social cost of carbon." The court upheld the standards in 2012.<sup>4</sup>

### **WHAT ABOUT THE UPDATED "SOCIAL COST OF CARBON"? WASN'T THAT DONE IN SECRET?**

The task force promised to update its analysis in response to new studies and developments. In 2013, the task force published its first update, with the dollar values cited above.

The task force did not change its methodology. It simply took into account recent peer-reviewed studies by economists who have incorporated updated peer-reviewed scientific findings, such as new information on damages to agriculture from droughts and floods, and to coastal regions from sea level rise.

Based on new information, the task force raised its estimates of the benefits of curbing carbon pollution.

It's these new, higher estimates that have set off the howls of protest.

The task force made its updated report public and put it in the public record of the Department of Energy's new energy efficiency standards for microwave ovens.

It is true that the updated report became public after the comment period closed on the microwave standard. But it is also true that the "social cost of carbon" estimate – whether the old one or the new one – played no role in DOE's choice of the microwave standard. It would have been set at the same level – one that saves money for consumers of new microwaves – either way.

The public will have a full opportunity to comment

before the updated estimate is used in setting future standards for carbon pollution and energy efficiency. In

other words, everyone concerned will have a chance to pour over its methodology, its studies, and its results before the update makes a difference.

### **AREN'T THERE ECONOMISTS WHO CALL THESE BENEFIT ESTIMATES "CLOSE TO USELESS?"**

Some critics are seizing on comments by MIT economist Robert Pindyck, who has written that the government's models "have crucial flaws that make them close to useless as tools for policy analysis."

Pindyck himself says he's being misinterpreted by critics of the social cost of carbon.<sup>5</sup> His concern is that the current benefit values – e.g., \$33 per ton in 2010 – are *underestimates*. "If anything," he told the *Wall Street Journal*, "the cost of carbon could be higher" than the administration's estimates.<sup>6</sup>

Why? Because they don't take into account the possibility of very high damages from *catastrophic* climate changes.

Including the benefits of avoiding possible catastrophic outcomes – in other words, thinking about this like an insurance policy – would push the "social cost of carbon" estimates up a lot higher, and justify far stronger action against climate change.

### **WHY ARE THE ECONOMISTS LOOKING AT IMPACTS AND BENEFITS ABROAD, NOT JUST IN AMERICA?**

They are following an economists' version of the Golden Rule. Carbon pollution doesn't stay within one

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***U.S. Court of Appeals***

country's borders. It spreads around the world and hurts us all. We want to hold other countries – whether China, India, or Europe – accountable for the effects of their carbon pollution on us. So it is only right for us to consider the effects of our carbon pollution on others.

And many climate change impacts abroad have clear impacts on America. When millions of people are displaced by drought or storms, Americans shoulder greater costs for humanitarian assistance. Climate impacts can force millions of people to cross borders in search of safety. And our military recognizes that climate-driven water scarcity can trigger social unrest and war in places like the Middle East and Africa.

So it only makes sense to look at the costs of climate change, and the benefits of curbing carbon pollution, wherever they fall.

### **ISN'T THIS A "BACK-DOOR CARBON TAX"?**

Some critics are calling the government's benefit estimate a "carbon tax." Supposedly, the hidden agenda is to charge Americans more money.

This is upside-down and backwards. Economists are estimating what carbon pollution is *costing* us. And they are calculating what we will *save* – in better health, in lower food costs, in less storm damage, in less property lost to encroaching seas – if we have less carbon pollution.

The critics include some of the loudest advocates of cost-benefit analysis. But here they want to put their heads in the sand and ignore all the damages from carbon pollution, and all the benefits of curbing that pollution.

***In the end, the question comes down to whether we really want to leave our children and grandchildren holding the bag? Or whether we are willing to curb carbon pollution now to protect them, as well as ourselves?***

### **For more information, contact:**

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<sup>1</sup> Interagency Working Group on Social Cost of Carbon, United States Government, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, (Feb. 2010), <http://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf>. The interagency working group published an update this year. *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866* (May 2013), [http://www.whitehouse.gov/sites/default/files/omb/inforeg/social\\_cost\\_of\\_carbon\\_for\\_ria\\_2013\\_update.pdf](http://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf).

The agencies included the Council of Economic Advisors, Council on Environmental Quality, National Economic Council, Office of Management and Budget, Office of Science and Technology Policy, Office of Energy and Climate Change, the Environmental Protection Agency, and the Departments of Agriculture, Commerce, Energy, Transportation and Treasury.

<sup>2</sup> Testimony of Howard Shelanski, Administrator of the OMB Office of Information and Regulatory Affairs, before the House Oversight Subcommittee on Energy (July 18, 2013), available at <http://oversight.house.gov/wp-content/uploads/2013/07/Shelanski-OIRA-Testimony-SCC-7-18.pdf>.

<sup>3</sup> *Center for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1200 (9<sup>th</sup> Cir. 2008).

<sup>4</sup> *Coalition for Responsible Regulation v. EPA*, 684 F.3d 102 (D.C. Cir. 2012).

<sup>5</sup> Laurie Johnson, Robert S. Pindyck in his own words (and yes, he read and agreed with this blog), [http://switchboard.nrdc.org/blogs/ljohnson/robert\\_s\\_pindyck\\_in\\_his\\_own\\_wo.html](http://switchboard.nrdc.org/blogs/ljohnson/robert_s_pindyck_in_his_own_wo.html).

<sup>6</sup> Keith Johnson, *Greenhouse-Gas Fight Escalates*, Wall Street Journal (Sept. 2, 2103), <http://online.wsj.com/article/SB10001424127887324324404579040950076712782.html>.