

CLIMATE AND ENVIRONMENT

Scientists have a new way to calculate what global warming costs. Trump's team isn't going to like it.

By [Chelsea Harvey](#)

January 12, 2017 at 7:00 a.m. EST

How we view the costs of future climate change, and more importantly how we quantify them, may soon be changing. A much-anticipated [new report](#), just released by the National Academy of Sciences, recommends major updates to a federal metric known as the “social cost of carbon” — and its suggestions could help address a growing scientific concern that we’re underestimating the damages global warming will cause.

The social cost of carbon is an Obama-era metric first addressed by a federal working group in 2009. The basic premise is simple: Scientists agree that climate change will have all kinds of impacts on human societies, including natural disasters and effects on human health, productivity and agricultural output, all of which have economic consequences.

The social cost of carbon, then, refers to the monetary cost of emitting a single ton of carbon dioxide into the atmosphere, given that these emissions will further contribute to global warming. The value has been used to aid in cost-benefit analyses for a variety of federal environmental rules. Currently, it’s set at about \$36 per ton of carbon dioxide.

But the new NAS report, requested by the federal Interagency Working Group on the Social Cost of Carbon, suggests the methodology used to arrive at this value is in need of updating, both to make it more transparent and more scientifically sound. It makes a number of recommendations for future estimates aimed at helping the process “draw more readily on expertise from the wide range of scientific disciplines relevant to [the social cost of carbon] estimation.”

“I think the report has laid out an important blueprint for how to update the most important number that you’ve never heard of,” said [Michael Greenstone](#), an economist at the University of Chicago and former chief economist for President Obama’s Council of Economic Advisers. Greenstone helped convene the first federal working group to estimate the social cost of carbon and served as a reviewer on the new NAS report. “Social and economic understanding of climate change has advanced greatly in the last six years, since the original social cost of carbon was released, and the report identifies important ways to take advantage of those improvements in our understanding.”

The method developed by the original federal working group relies on a set of three models which translate current carbon emissions into future temperature increases, factor in the damages that may be caused by the resulting climatic changes in the future and then translate these damages into dollars. The method also applies a discount rate to account for the fact that these damages will occur in the future, rather than right away — the discount rate can be thought of as a kind of interest rate addressing how much the future generation is willing to pay now to avoid climate consequences in the future.

The new report recommends a new framework that unbundles the various steps of the calculation process and addresses them in separate modules, all of which feed into and inform each other. The report suggests that, over the next two-to-three years, these modules be shaped to rely on the most relevant and up-to-date science in each area — and it also suggests that estimates of the social cost of carbon be updated every five years.

These recommendations address a growing concern in the scientific community that our increasing scientific understanding of the consequences of climate change isn’t adequately represented in the current methodology. In fact, climate scientists and economists alike have begun to argue that the current models may actually be underestimating the social cost of carbon.

A [2015 survey](#), for instance, conducted by researchers from the New York University School of Law’s Institute for Policy Integrity, found that more than half the respondents thought the current estimate of the social cost of carbon was too low, while only eight percent thought it was too high. In addition, multiple recent studies have attempted to improve our understanding of the way climate change will affect human societies in the future — and what these effects will cost.

Despite these concerns from the scientific community, recent documents suggest that the incoming Trump administration may [seek to reconsider](#) — or even do away with — the metric. A memo penned in November by Energy Department transition leader Thomas Pyle suggested the incoming administration should review the social cost of carbon and said that if the metric “were subjected to the latest science, it would certainly be much lower than what the Obama administration has been using.”

But the opposite effect could occur if the academy’s recommendations are applied. There are several major ways the new report’s recommendations could cause this to happen, said [Richard Revesz](#), a law professor and dean emeritus of the New York University School of Law, who also served as a reviewer on the new report. For one thing, accounting for certain climate damages that were omitted in the older models could drive the value up, he said.

A second factor involves the report’s approach to the use of discounting. When calculating the social cost of carbon, applying a higher discount rate causes the cost to decrease, and vice versa. Critics who favor a lower social cost of carbon have sometimes argued that the current discount rate used by the federal government — 3 percent, in most cases — is too low.

“The report endorses the use of declining discount values, where the declining rates respond to uncertainty around a number of factors,” Revesz said. “As for negative impacts that happen far into the future, those models would lead to substantially lower discount rates, and lower discount rates would lead to higher values for the social cost of carbon.”

Revesz added that the current estimate of the social cost of carbon is a global estimate — that is, it applies to the entire world, not just the United States. Some critics have argued for a U.S.-specific estimate in the future, which would be a smaller value than the global estimate. This argument is also addressed in the new report, which recognizes the many uncertainties and difficulties that would be associated with making such an estimate.

“The impacts of carbon dioxide are felt globally, regardless of where the emissions occur,” noted [Richard Newell](#), president and chief executive of Resources for the Future and co-chair of the committee that authored the report, at a Wednesday press conference to present the new report. “In addition, climate impacts in other countries may affect the U.S. in a more indirect fashion.”

The committee did not speculate on how the report’s recommendations would affect the metric’s values, and the new report isn’t binding — it’s simply a set of recommendations. This means the incoming Trump administration isn’t legally obligated to use them once in office.

But Revesz added that the report’s release could place pressure on the Trump administration in a different way, making it more difficult for the administration to make any arbitrary or unscientific changes to the social cost of carbon estimate to lower its value once in office.

“If the metric is revised, then the incoming administration would have an obligation to explain why it’s departing from the current approach,” Revesz said. Any changes made without adequate scientific justification would likely be struck down in court. And given that the new academy report is likely to be recognized as the “gold standard for scientific evaluation of the social cost of carbon,” he said, it would be difficult to justify any changes that dramatically depart from its recommendations.

Still, despite the transition team’s criticism of the current metric, how the new administration will choose to approach it once in office remains to be seen.

“This report is a blueprint of actions that should be taken in the near term and actions that should be taken in the longer term,” Revesz said, adding that the most responsible action would be to “follow the prescription of the report.”

Read more:

[On the eve of Trump, Energy Department announces new policy to protect scientists](#)

[Antarctica is about to lose an enormous piece of ice. The question is what happens after that.](#)

[America’s first ‘clean coal’ plant is now operational — and another one is on the way](#)

For more, you can sign up for our weekly newsletter [here](#) and follow us on Twitter [here](#).