Committee on Assessing Approaches to Updating the Social Cost of Carbon

Sponsors’ Interests and Goals for the Study

Presentation on Behalf of the Interagency Working Group on the Social Cost of Carbon

Council of Economic Advisers

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Introduction

- Rigorous evaluation of the benefits and costs of policies has been a core tenet of the Federal rulemaking process for decades.
  - Executive Orders 12866 and 13563 direct agencies to use the best available scientific, technical, economic, and other information to quantify the costs and benefits of rules.
  - “In applying these principles, each agency is directed to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible.” (EO 13536)
  - By definition, the Social Cost of Carbon quantifies the present and future benefits of reducing carbon dioxide emissions.
Estimates of the Social Cost of Carbon (SCC) have been published in the academic literature for many years.
- There were even meta-reviews of estimates as early as 2002: Clarkson and Deyes (2002)

In 2007, the United States Court of Appeals for the Ninth Circuit ruled that DOT must include an estimate of the benefits of reducing CO$_2$ emissions as part of a fuel economy rulemaking.
- The court stated, “[w]hile the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero.”

In 2008, different agencies began using different estimates of the SCC to monetize carbon reduction benefits in rulemakings.
For consistency in the SCC values used across agencies, the Administration launched an interagency working group in 2009.

- Led by CEA and OMB, the working group had active participation from CEQ, NEC, OECC, OSTP, DOC, DOE, DOT, EPA, Treasury, USDA.
- In 2009 “interim” SCC estimates were issued, based on a literature review.
- Updated SCC estimates were issued in 2010.
- The SCC estimates underwent a further technical update in May 2013.
  - This update did not change the methodology; it simply updated the analysis to reflect the latest versions of the models used in the peer-reviewed literature.
  - Minor technical corrections were issued in November 2013 and July 2015.

The SCC has been used in over 40 regulatory actions published in the Federal Register to date.

- Used across the U.S. government.
Extensive Opportunities for Public Input

• Extensive opportunities for public input in the process:
  ▪ Public comment process in each agency rulemaking using the SCC.
  ▪ An OMB comment period on the 2013 Technical Support Document.
  ▪ GAO 2014 review of the processes of the working group:
    ➢ “According to several participants and the Technical Support Document, the working group’s processes and methods took steps to disclose limitations and incorporate new information by considering public comments and revising the estimates as updated economic and scientific research became available.”
  ▪ Commenters offered a wide range of perspectives.
    ➢ Stakeholder comments offered in the public comment periods discussed the process of developing the estimate, all aspects of the methodology, and the estimates themselves; and provided diverse suggestions for improvements for future updates.

• We are seeking your independent expert advice on how to approach future updates. Broadly, we are interested in having you:
  ▪ Review the latest research on modeling the economic impacts of climate change.
  ▪ Provide recommendations on the technical merits of different approaches.
  ▪ Highlight research priorities moving forward.
To inform updates to the SCC estimates, we requested a two-part study:

1. Technical merits and challenges of a near-term update to the SCC estimates.

2. Technical approaches, merits, and challenges of a more comprehensive update to the SCC estimates.

The goal is to ensure that the SCC estimates continue to reflect the best available science and evidence.
Part 1: Technical Merits and Challenges of a Near-term Update to the SCC Estimates

Is there sufficient benefit to investing limited resources in a near-term update to the SCC estimates?

Questions to consider:

1. Update the probability density function (pdf) for the equilibrium climate sensitivity (ECS) to reflect the IPCC AR5 consensus?
2. Recalibrate the pdf using studies besides Roe and Baker (2007)?
3. Enhance the qualitative characterization of uncertainty in the current SCC estimates to increase transparency for use in regulatory impact analyses?
What are the potential merits and challenges of alternative approaches to updating the SCC estimates, while ensuring that they continue to reflect the best available science and evidence?

Possibilities to consider fall into the following categories:

1. Choice of integrated assessment models (IAMs) and damage functions.
2. Climate science modeling.
3. Socio-economic and emissions scenarios.
4. Presentation of uncertainty.
5. Discounting.
Possible Questions to Inform Discussions around the Part 2 Charge

1. Choice of integrated assessment models and damage functions.
   - Merits and challenges of relying on externally developed IAMs?
   - Are there other IAMs that can be used? What criteria should be used for inclusion?
   - Merits and challenges of using multi-model ensembles?
   - Merits and challenges of developing a new in-house modeling framework? Or a new modeling framework in addition to external IAMs?
   - How to assess the accuracy and scientific defensibility of damage function assumptions in the external IAMs being used?
   - Merits and challenges of updating damage functions in the IAMs?
   - Merits and challenges of using an aggregate or disaggregate damage function?
2. Climate science modeling.
   - Merits and challenges of relying on the default climate and physical systems components in the IAMs used?
   - Are other climate models available that can be included in an IAM that would provide improvements to the modeling of the physical systems?
   - Approaches to incorporating scientific assessments of potential extreme events, positive climate feedbacks, and abrupt climate change into IAMs?
   - Potential criteria that could be used to guide the process of updating the climate modeling in IAMs over time?
Possible Questions to Inform Discussions around the Part 2 Charge

3. Socio-economic and emissions scenarios.
   - Merits and challenges of using harmonized exogenous socio-economic and emissions scenarios across multiple IAMs to estimate the SCC?
   - Potential sources for updated exogenous scenarios and criteria for including these scenarios in the analysis? Extrapolating these scenarios?
   - Potential approaches for including a more formal treatment of uncertainty in future socio-economic and emissions pathways? Merits and challenges of these approaches?
   - Merits and challenges of including scenarios that incorporate possible future changes in policies?
4. Presentation of uncertainty.

- Additional information that could be reported to more effectively convey uncertainty, while still providing a range of robust estimates for practical use in policy?
- Technical criteria that can be used to select a central SCC estimate from a distribution? Technical criteria when selecting a range or confidence interval?
- Merits and challenges of approaches to weighting results from sets of input assumptions (e.g., multiple models, multiple scenarios, multiple discount rates)?
5. Discounting.
   - Unique considerations of the SCC that warrant discounting in a different way than other long-term regulatory analyses?
Further Considerations and Final Thoughts

• Research priorities.
  ▪ Most critical research needs for improving SCC analysis?

We recognize that the charge covers a broad range of considerations. We leave it to the committee to prioritize among them to provide the most useful guidance.