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Via Regulations.gov

Dominic J. Mancini
Deputy Administrator
Office of Information and Regulatory Affairs
Office of Management and Budget
New Executive Office Building
725 17th Street NW
Washington, D.C. 20503

Re: The American Petroleum Institute's Comments in Response to the Office of Management and Budget's Notice of Availability and Request for Comments on the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates Under Executive Order 13990." (86 Fed. Reg. 24,669) (May 7, 2021).

Dear Deputy Administrator Mancini:

This letter provides comments from the American Petroleum Institute ("API") in response to the Office of Management and Budget's ("OMB's") Notice of Availability and Request for Comments on the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates Under Executive Order 13990" ("Interim TSD").¹ We appreciate and support OMB's decision to solicit comments on the federal government's interim estimates of the social costs of carbon, methane, and nitrous oxide (collectively, "the SC-GHG estimates") and the process through which the Interagency Working Group ("IWG") will incorporate and consider new information in developing finalizing new SC-GHG estimates.

API shares this administration's goal of reducing emissions across the economy and, specifically, those from energy production, transportation and use by society in order to build a lower emissions future. Our industry also understands that achieving meaningful GHG emissions will take a combination of policies, innovation, voluntary initiatives and a partnership between government and the private sectors. The need for this combination of actions, initiatives, and partnerships informed API's recently released Climate Action Framework that discusses, in part, the need to adopt economy-wide, market-based solutions to tackle the climate challenge.² Indeed, API has called for sensible action to price carbon economy-wide while avoiding regulatory duplication.

We are concerned, however, that the administration's solicitation of these comments on an Interim TSD that was published two months prior, without clarity about the broader steps that

¹ 86 Fed. Reg. 24,669 (May 7, 2021).

² See API Climate Action Framework at <https://www.api.org/-/media/Files/EHS/climate-change/2021/api-climate-action-framework.pdf?la=en&hash=E6BB3FA3013B52153E10D3E66C52616E00411D20>.

will be taken prior to proposing and finalizing revised values, does not reflect a commitment to developing SC-GHG estimates through a transparent and collaborative process.

As President Biden noted in Executive Order 13990 (“E.O. 13990”) on his first day in office, “[a]n accurate social cost is essential for agencies to accurately determine the social benefits of reducing greenhouse gas emissions when conducting cost-benefit analyses . . .”³ To that end, E.O. 13990 further instructs that, in undertaking actions such as developing SC-GHG estimates, “the Federal Government must be guided by the best science and be protected by processes that ensure the integrity of Federal decision-making.”⁴ Consistent with that mandate, President Biden also issued a Presidential Memorandum to all heads of executive departments and agencies reaffirming the Biden Administration’s commitment to the principles outlined in President Clinton’s Executive Order 12866 (“E.O. 12866”)⁵, which established the basic foundation for executive branch review of regulations, and President Obama’s Executive Order 13563 (“E.O. 13563”)⁶ which “took important steps toward modernizing the regulatory review process.”⁷

Thus, through the Regulatory Review Memorandum, President Biden reaffirmed his administration’s commitment to “allow for public participation and an open exchange of ideas;”⁸ using “best available techniques to quantify anticipated present and future benefits and costs as accurately as possible;”⁹ and ensuring “the objectivity of any scientific and technological information and processes used to support . . . regulatory actions.”¹⁰

One week later, President Biden reiterated to his executive departments and agency heads that “[i]t is the policy of my Administration to make evidence-based decisions guided by the best available science and data.”¹¹ According to the President Biden’s Scientific Integrity Memorandum, “[w]hen scientific or technological information is considered in policy decisions, it should be subjected to well-established scientific processes, including peer review where feasible and appropriate. . .”¹²

While API supports the principles President Biden outlined in these Executive Orders and presidential memoranda, we question whether they are appropriately reflected in the E.O. 13990 requirement that a hastily reestablished IWG publish interim SC-GHG estimates within 30 days.¹³ Development of the SC-GHG estimates within such short timeframe and without the

³ E.O. 13990 at Sec. 5.

⁴ E.O. 13990 at Sec. 1.

⁵ Signed Sept. 30, 1993.

⁶ Signed Jan. 18, 2011.

⁷ Memorandum for the Heads of Executive Departments and Agencies regarding “Modernizing Regulatory Review” (Jan. 20, 2021) (“Regulatory Review Memorandum”).

⁸ E.O. 13563 at Sec. 1(a).

⁹ E.O. 13563 at Sec. 1(c).

¹⁰ E.O. 13563 at Sec. 5.

¹¹ “Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking” Memorandum From President Biden to the Heads of Executive Departments and Agencies (Jan. 27, 2021) (“Scientific Integrity Memorandum”). *See also* Executive Order 14007, which establishes the President’s Council of Advisors on Science and Technology. (Jan. 27, 2021) (“E.O. 14007”).

¹² Scientific Integrity Memorandum preamble.

¹³ E.O. 13990 at Sec. 5(b)(ii)(A).

benefit of public comment or other expert review did not allow for an open exchange of ideas and impeded the IWG's ability to identify and consider the best available data. And as previously noted, this administration's stated interest in "public participation and an open exchange of ideas" is particularly difficult to square with OMB's decision to begin taking comment on the Interim SC-GHG estimates nearly two months after they were published for use by federal agencies.¹⁴

Therefore, while API supports the principles President Biden outlined in these Executive Orders and presidential memoranda, the IWG's approach to developing the interim SC-GHG estimates makes it critical that OMB and the IWG clarify the steps that will be undertaken to ensure adequate time for public comment and other expert review and that will allow for an open exchange of ideas, ultimately enabling the IWG to identify and consider the best available data.

The National Academies of Sciences, Engineering, and Medicine ("NASEM") issued a report in 2017 recommending that the IWG draw on internal and external technical expertise and incorporate scientific peer review.¹⁵ In particular, NASEM 2017 stated that draft revisions to the SC-GHG methods and estimates should be subject to public notice and comment, allowing input and review from a broader set of stakeholders, the scientific community, and the public. The NASEM also recommended that the government's approach to estimating the SC-GHG be regularly reviewed by an independent scientific assessment panel to identify improvements for potential future updates and research needs.¹⁶ Therefore any revised estimates should be subject to notice-and-comment prior to finalization, and concurrently, those estimates should be reviewed by an independent scientific review panel charged specifically with evaluating their applicability to regulatory decision-making. The NASEM also recommended that the government's approach to estimating the SC-GHG be regularly reviewed by an independent scientific assessment panel to identify improvements for potential future updates and research needs. (NASEM 2017 at 10).

Notwithstanding our concerns about the interim SC-GHG estimation process and the implications of that process on the IWG's forthcoming development of revised SC-GHG values, API is herein submitting its recommendations for improving the SC-GHG estimates and the process through which they are developed. As you will note, we are not recommending any approach that would impede this Administration's development of revised SC-GHG estimates. Rather, we are providing constructive and actionable recommendations that the IWG can use to improve the accuracy, rationality, defensibility, and thus, durability of its estimates of the SC-GHG.

¹⁴ See 86 Fed. Reg. at 24,669, published on May 7, 2021 requesting comment Interim TSD released on February 26, 2021.

¹⁵ See National Academies of Sciences, Engineering, and Medicine 2017. *Valuing Climate Damages. Updating Estimates of the Social Cost of Carbon Dioxide*. Washington, DC: The National Academies Press ("NASEM 2017") at 10. The NASEM also recommended that the government's approach to estimating the SC-GHG be regularly reviewed by an independent scientific assessment panel to identify improvements for potential future updates and research needs. (NASEM 2017 at 10).

¹⁶ NASEM 2017 at 10.

More specifically, in Section II, we identify our concerns with the transparency of the processes the IWG employs in developing the SC-GHG estimates, and we recommend process improvements that are consistent with the Administration’s scientific integrity standards, academic scholarship, prior stakeholder comments, and the NASEM’s 2017 recommendations. Adopting a more structured, open, and collaborative SC-GHG estimation process need not unduly delay the IWG’s efforts to develop a final SC-GHG estimate, and would likely improve the reliability, credibility, and legal defensibility of the values ultimately published by the IWG. To that end, we are specifically recommending that the IWG publish a proposal for, and accept public comment on, its anticipated September 1, 2021¹⁷ recommendations regarding potential applications for the SC-GHG.

Indeed, in Section III, we discuss why the inherent limitations of the SC-GHG estimates and their limited utility in rulemaking should guide the IWG as it considers changes to the SC-GHG development process. We also discuss some of the IWG’s analytical framing decisions and provide recommendations on how the IWG can more fully characterize and potentially reduce the uncertainty or bias inherent in these model inputs and assumptions.

As with all aspects of this comment letter, each of our technical recommendations is supported by detailed analysis and ample citation to relevant papers and regulatory/analytical requirements. We hope that OMB and the IWG will view our concerns and recommendations in accord with the constructive and collaborative spirit with which we have offered them. While we recognize that OMB and the IWG may not agree with all of the insights we are providing, we hope that OMB and the IWG will at least consider our views and provide a reasonably detailed response describing how our recommendations were considered. More broadly, and recognizing the constraint of the short window of opportunity to provide comment, we hope that the concerns and recommendations described herein can lead to a more meaningful dialogue between OMB/IWG and stakeholders, including API.

I. BACKGROUND

As noted in the Interim TSD, the SC-GHG represents the IWG’s estimate of the “monetary value of the net harm to society associated with adding a small amount of GHG to the atmosphere in a given year.”¹⁸ This metric, which originally attempted to estimate the social cost of only CO₂ emissions, “was explicitly designed for agency use pursuant to E.O. 12866. . .”¹⁹ Since it was signed by President Clinton in 1993, E.O. 12866 has directed agencies to “propose or adopt a

¹⁷ See 86 Fed. Reg. at 24,670.

¹⁸ Interim TSD at 2.

¹⁹ Palenik Z. (2020). The Social Cost of Carbon in the Courts: 2013-2019. *New York University Environmental Law Journal*, 28(3), 393-428. Per E.O. 12866 Sec. 1(a): “Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. . . . Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.”

regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs.”²⁰

Initially, the federal government’s consideration of CO₂ emissions in RIAs was sporadic.²¹ The government’s consideration of CO₂ emissions became more frequent and consistent, however, after a 2008 Ninth Circuit decision remanded a fuel economy rule for failing to consider the potential benefit of CO₂ emission reductions, stating that “while the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero.”²² Subsequent court decisions on the necessity and method of considering CO₂ emissions for federal agency actions have been mixed.

In response to the Ninth Circuit’s remand and to help federal agencies comply with E.O. 12866, President Obama in 2009 established the IWG. The IWG was tasked with developing “a transparent and defensible method, specifically designed for the rulemaking process, to quantify avoided climate change damages from reduced CO₂ emissions.”²³ As such, from the beginning, the IWG’s SC-GHG estimates were exclusively intended to assist agencies in the development of RIA for “significant regulatory actions” involving GHG emissions. Notably, [t]his does not apply to many routine agency actions that will produce GHG emissions.”²⁴

The IWG’s November 2013 TSD represented the first time OMB accepted comment on the SC-CO₂ estimates.²⁵ Although OMB had finally agreed to accept comments, it did not provide any materials other than the most recent TSDs. Thus, comments submitted by API and others urged the IWG to select its IAM model parameters through a highly transparent, collaborative, and

²⁰ E.O. 12866 at Sec. 1(a). When the proposed action is deemed a “significant federal action,” E.O. 12866 required agencies to coordinate with OMB’s Office of Information and Regulatory Affairs (“OIRA”) in the development of a formal cost-benefit analysis called a Regulatory Impact Analysis (“RIA”). (E.O. 12866 at Sec. 6(a)(3)(C)). A “Significant regulatory action” is “any regulatory action that is likely to result in a rule that may: (1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in [E.O. 12866]” (Sec. 3(f)).

²¹ Palenik Z. (2020). The Social Cost of Carbon in the Courts: 2013-2019. *New York University Environmental Law Journal*, 28(3), 393-428. (noting that when agencies did consider CO₂ emissions, they utilized a variety of different methodologies that resulted in a wide range of estimates, each with different ranges of uncertainty). The government was consistent, however, in limiting use of these early estimates to RIAs, and in providing separate values for “domestic” and “global” impacts. (See 2010 TSD, note 1, at 3).

²² *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1200 (9th Cir. 2008).

²³ 2010 TSD at 5.

²⁴ Palenik Z. (2020). The Social Cost of Carbon in the Courts: 2013-2019. *New York University Environmental Law Journal*, 28(3), 393-428.

²⁵ OMB’s first-ever solicitation of public comment on the SC-CO₂ estimates was likely in response to a September 4, 2013 multi-association Petition for Correction filed under the Information Quality Act (“IQA”) and numerous demands from Congress and other stakeholders for increasing the transparency of the SC-CO₂ estimation process.

data-driven process because modest changes to just a few model inputs drastically changes the output of the IAMs and therefore the SC-CO₂ estimate.²⁶

The IWG updated its estimates of the SC-CO₂ again in August of 2016²⁷, and while API and others continued to have concerns with the transparency and rigor with which the IWG selected its model inputs, the TSD for the 2016 SC-CO₂ reflected some improvement to the characterization of uncertainty that was consistent with the NASEM Phase 1 Report,²⁸ as well as API's prior comments. Notably, in an addendum to the 2016 TSD, the IWG adapted its SC-CO₂ methodology to estimate social costs for methane and nitrous oxide for the first time.²⁹

President Trump disbanded the IWG months later,³⁰ but his administration continued to use the same IAMs and the IWG's same overall methodology for estimating the SC-GHGs. As the U.S. Department of Justice explained in its June 4, 2021 brief in opposition to several states' motion to preliminarily enjoin Section 5 of E.O. 13990, and the interim SC-GHG values published under E.O. 13990:

Although the Trump Administration's policy approach to climate issues differed in many ways from that of the preceding administration, it continued to use standardized estimates of the social costs of greenhouse gases. Pursuant to E.O. 13783, EPA developed interim SC-CO₂ estimates by making two (*and only two*) changes to the Working Group's 2016 estimates: First, it began reporting estimates that attempted to capture only the domestic impacts of climate change, and second, it applied 3% and 7% discount rates. . . . Accordingly, although the Working Group had been disbanded, and although the estimates of the social costs of greenhouse gas estimates were now lower (because of higher discount rates and an exclusive focus on U.S.-domestic damages), agencies continued to

²⁶ See multi-association comments filed February 26, 2014 (OMB-2013-0007-0140). OMB's July 2015 Response to Comments did not provide the key information sought by API and others, and resisted recommendations that the IWG select these parameters through a transparent process subject to peer review. (See July 2015 Response to Comments: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866.) To its credit, however, OMB requested feedback from the NASEM on the IWG's process for updating the estimates of the SC-CO₂. (See NASEM 2017 at 1).

²⁷ 2016a TSD.

²⁸ National Academies of Sciences, Engineering, and Medicine 2016. *Valuing Climate Damages. Assessment of Approaches to Updating the Social Cost of Carbon: Phase 1 Report on Near-Term Update*. Washington, DC: The National Academies Press ("NASEM 2016").

²⁹ Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social cost of Methane and the Social Cost of Nitrous Oxide ("2016b TSD"). OMB did not request or receive the NASEM's feedback on the new estimates of the social costs of methane and nitrous oxide, nor were they subject to notice and comment, or peer reviewed. Rather, they were premised entirely on a U.S. Environmental Protection Agency ("EPA") employee's 2015 paper, which at that point had not been reviewed or published. (See Martin, A.L., Kopits, E.A., Griffiths, C.W., Newbold, S.C., and A Wolverton. 2015. Incremental CH₄ and N₂O Mitigation Benefits Consistent with the U.S. Government's SC-CO₂ Estimates. *Climate Policy* 15(2): 272-298).

³⁰ See Executive Order 13783 (March 28, 2017) ("E.O. 13783").³⁰

estimate the social costs of greenhouse gases in their cost-benefit analyses, as ordered by the President, just as they had done in prior administrations.³¹

While these two changes³² were seemingly modest, their impact on the SC-GHG estimates, was anything but small. When the Obama Administration conducted its RIA for the Clean Power Plan (“CPP”) in 2015, it estimated social costs of \$12, \$40, \$60, and \$120 per short ton of CO₂ emissions for the 5%, 3%, 2.5%, and 95th percentile of the 3% discount rates for the year 2020 in 2011 dollars.³³ When the Trump Administration conducted its RIA for the review of the CPP in 2017, it estimated the SC-CO₂ to be \$6 per metric ton in 2020 (also in 2011 dollars) at the 3% discount rate, and \$1 at the 7% rate.³⁴

Thus, in the span of just two years, the same government agency, utilizing the ‘best available science’ put forth estimates for the same metric that had changed by so many orders of magnitude as to be farcical. This was the case even though the Trump and Obama analyses utilized the same underlying models.³⁵

Now, just a few years later, the IWG has republished the prior 2016 SC-GHG values as the new Interim SC-GHG estimates, and as instructed by E.O. 13990, these estimates “tak[e] global damages into account” and utilize discount rates that the IWG believes “reflect the interests of future generations in avoiding threats posed by climate change.”³⁶ As a result, the Trump Administration’s estimated SC-CO₂ values of \$1 and \$6 per metric ton in 2020 (in 2011 dollars)³⁷ have increased to \$14, \$51, \$76, and \$152 per metric ton of CO₂ emissions for the 5%, 3%, 2.5%, and 95th percentile of the 3% discount rates for the year 2020 (in 2020 dollars).³⁸

This whipsawing of SC-GHG estimates is not based on any objective errors or omissions. Indeed, the IWG and Trump Administration can both point to academic scholarship and regulatory guidance in support of their selections of discount rates and geographic scales. Rather, these divergent estimates demonstrate the extent to which any given estimate of the SC-

³¹ *Missouri v. Biden*, 4:41-cv-00287 (E.D. MO 2021) (Page 11 of Defendants’ June 4, 2021 Combined Memorandum of Law in Support of Motion to Dismiss and in Opposition to Plaintiffs’ Motion for a Preliminary Injunction) (emphasis added).

³² These changes flowed from E.O. 13783 (“when monetizing the value of changes in greenhouse gas emissions resulting from regulations, including with respect to the consideration of domestic versus international impacts and the consideration of appropriate agencies shall ensure, to the extent permitted by law, that any such estimates are consistent with the guidance contained in OMB Circular A-4.”)

³³ U.S. EPA, EPA-452/R-15-03 Regulatory Impact Analysis for the Clean Power Plan (2015) at 4-2. (The four SC-CO₂ estimates differ based on use of discount rates of 5%, 3%, 2.5%, and the ninety-fifth percentile distribution at the 3% discount rate. (See 4-6, 4-7).

³⁴ U.S. EPA, Regulatory Impact Analysis for the Review of the Clean Power Plan: Proposal (2017) at 44. The conversion factor for metric ton to short ton is approximately 0.91, such that these estimates were actually about 9% lower when compared to the Obama-era estimates (2017 CPP RIA at 44).

³⁵ Taylor, A. (2018). Why the social cost of carbon is red herring. *Tulane Environmental Law Journal*, 31(2), 345-372 at 347.

³⁶ E.O. 13990 at Sec. 5(a) and 5(b)(iii).

³⁷ Using discount rates of 7% and 3%.

³⁸ Interim TSD at Table ES-1 (using discount rates of 5%, 3%, 2.5%, and the 95th percentile of the 3% discount rate)

GHG differs based on one or two subjective judgements. The output of the IAMs is dependent on subjective framing decisions. As such, API is not herein declaring that the IWG’s interim SC-GHG estimates are correct or incorrect, inasmuch as we are urging OMB to recognize that these estimates “reflect ideology as much as they reflect the actual, long-term externality cost of climate change.”³⁹ The fact that some decisions are subjective and not purely scientific emphasizes the need for robust stakeholder and public engagement.

Indeed, as API’s 2014 comments have foretold and recent history has confirmed, this administration and any subsequent administration can use the IWG’s SC-GHG estimation process to produce whatever estimate is necessary to support their policy goals. This inherent malleability raises serious questions of the SC-GHG estimates’ reliability or importance in rulemaking and policy analysis. It also illustrates the profound importance of adopting analytical framing decisions through a process that is open, transparent, structured, and data-driven.

II. THE PROCESS BY WHICH THE IWG ESTIMATES THE SOCIAL COSTS OF GHG EMISSIONS SHOULD BE FUNDAMENTALLY REFORMED

API enthusiastically supports President Biden’s recognition that “the Federal Government must be guided by the best science and be protected by processes that ensure the integrity of Federal decision-making.”⁴⁰ We are concerned, however, that these fundamental guiding principles were not regarded by the IWG in its rush to publish an interim update to its SC-GHG estimates. As the IWG now turns its efforts to developing revised SC-GHG estimates,⁴¹ we urge OMB to direct the IWG to adopt alternative procedures to ensure these estimates will be derived through a structured process that is transparent, collaborative, and data-driven.

a. OMB should require the IWG to develop transparent and evidence-based outputs guided by the best available science and data

Multiple statutes and guidelines require evidence-based decisions guided by the best available science and data. And when the federal government tasks itself with developing the scientific and technical analysis necessary to support its regulatory objectives, its obligation to utilize scientifically rigorous and transparent processes is at its apex.

We therefore urge OMB and the IWG to be guided by the Information Quality Act (“IQA”), which requires federal agencies to take steps to maximize the quality, objectivity, and integrity of the information they disseminate, and to provide a mode of redress to correct flawed or incomplete information.⁴² Consistent with its directive to other agencies and entities, OMB developed its own guidelines (“IQA Guidelines”) that require that the information it disseminates

³⁹ Taylor, A. (2018). Why the Social Cost of Carbon is Red Herring. *Tulane Environmental Law Journal*, 31(2), 345-372, 370. [T]hose who would consider inclusion of IAM-generated estimates, particularly high-dollar ones, of the SCC to be an unmitigated success should nonetheless pay heed to the crow on the shoulder: a high degree of arbitrariness is currently baked into these estimates and it is quite difficult to know the degree to which they may be relied upon for accuracy or manipulated by agencies across different administrations.

⁴⁰ E.O. 13990 at Sec. 1.

⁴¹ E.O. 13990 at Sec. 5(b)(ii)(B).

⁴² P.L. 106-554, §515, 144 Stat. 2763 (2001).

meets standards for objectivity, utility, and integrity.⁴³ The “objectivity standard” focuses on whether the information is “accurate, reliable, and unbiased and whether the information is presented in an accurate, clear, complete, and unbiased manner.”⁴⁴ The “integrity standard” refers to information security, such as protection of information from unauthorized access or revision, while the “utility standard” refers to the usefulness of the information for the intended audience’s anticipated purposes.⁴⁵

OMB’s IQA Guidelines require it to maximize the quality of information that it classifies as influential. “Influential information” generally refers to information that “will have a clear and substantial impact on important public policies or important private sector decisions.”⁴⁶ The SC-GHG estimates, upon which numerous agencies may base billions, if not trillions of dollars in regulatory costs, are obviously “influential information” that have had and will have a clear and substantial impact on important public policies and important private sector decisions.⁴⁷

Further, under OMB’s IQA Guidelines, such influential information must meet a higher level of “transparency.”⁴⁸ According to OMB, transparency requires that its findings be reproducible, within an acceptable range of imprecision, by third parties.⁴⁹ Influential information must also be transparent with respect to: (1) the source of the utilized data; (2) the various assumptions employed; (3) the analytic methods applied; and (4) the statistical assumptions employed.⁵⁰ All these transparency elements are important considerations in any objective, third-party review and analysis of agency information.

OMB imposes these guidelines on itself as well as on the information on which it relies. It requires OMB staff, and the working groups it oversees, to compile relevant information by acceptable and unbiased methods.⁵¹ Further, information collected must generally display indicia of reliability such as being subjected to peer review or being founded on transparent and reproducible methods.

OMB’s obligations under the IQA are significant, requiring OMB to issue government-wide guidelines that “provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies.”⁵² These obligations were put in place by

⁴³ Office of Management and Budget, *Information Quality Guidelines* (Oct. 1, 2002).

⁴⁴ IQA Guidelines at 8.

⁴⁵ IQA Guidelines at 1.

⁴⁶ IQA Guidelines at 8.

⁴⁷ IQA Guidelines at 8.

⁴⁸ IQA Guidelines at 2.

⁴⁹ IQA Guidelines at 2.

⁵⁰ 67 Fed. Reg. 369, 374 (Jan. 3, 2002).

⁵¹ 67 Fed. Reg. 373.

⁵² P.L. 106-554, §515, 144 Stat. 2763 (2001).

Congress and are supported by President Biden’s administration-wide commitment to “make evidence-based decisions guided by the best available science and data.”⁵³

President Biden’s Scientific Integrity Memorandum goes on to direct Executive Department and agency heads to take concrete steps to utilize well-established scientific processes, utilize peer review, avoid political interference, and “prevent the suppression or distortion of scientific or technological finding, data, information, conclusions, or technical results.”⁵⁴ Importantly, the Scientific Integrity Memorandum also “reaffirms” President Obama’s March 9, 2009 presidential memorandum on scientific integrity as well as the December 17, 2010 memorandum from the Director of the White House Office of Science and Technology Policy, which instructed agencies on the implementation of President Obama’s policies on scientific integrity.⁵⁵

As relevant to the SC-GHG estimates and the IWG process through which they are developed, the opening line of President Obama’s 2009 memorandum instructs:

Science and the scientific process must inform and guide decisions of my Administration on a wide range of issues, including improvement of public health, protection of the environment, increased efficiency in the use of energy and other resources, mitigation, and protection of national security. The public must be able to trust the science and the scientific process informing public policy decisions.

In furtherance of these important goals, President Obama instructed that “[t]o the extent permitted by law, there should be transparency in the preparation, identification, and use of scientific and technological information in policymaking.”

The primary benefit of public transparency is not necessarily that errors in analytic results will be detected, although error correction is clearly valuable. The more important benefit of transparency is that the public will be able to assess how much an agency’s analytic results hinge on the specific analytic choices made by the agency. Concreteness about analytic choices allows, for example, the implications of alternative technical choices to be readily assessed. This type of sensitivity analysis is widely regarded as an essential feature of high-quality analysis, yet sensitivity analysis cannot be undertaken by outside parties unless a high degree of transparency is achieved.⁵⁶

In the aggregate, these rules, guidelines, and policies are intended to ensure the administration develops analyses through processes that are objective, unbiased, and robust. Importantly, OMB, as the entity that oversees IQA implementation across all agencies, should have a

⁵³ Scientific Integrity Memorandum. *See also* Executive Order 14007, which establishes the President’s Council of Advisors on Science and Technology. (Jan. 27, 2021) (“E.O. 14007”).

⁵⁴ Scientific Integrity Memorandum at Sec. 1.

⁵⁵ Memorandum from John P. Holdren to the Heads of Executive Departments and Agencies regarding Scientific Integrity (Dec. 17, 2010).

⁵⁶ 67 Fed. Reg. at 374.

particular interest in ensuring those guidelines are followed to the greatest extent possible in its own regulatory decision making.

b. The Interim TSD appears to reflect OMB's continued reliance on a process that lacks structure, transparency, objectivity, and analytical rigor

While we support and appreciate this request for stakeholder feedback, we urge OMB to recognize that the solicitation of public comment alone will not assure that the IWG's SC-GHG estimation process is transparent, objective, or evidence-based. To the contrary, this request for comment is itself a cause to be concerned about the IWG's SC-GHG estimation process because OMB did not allow for comment on the Interim TSD until nearly two months after it was published for use.⁵⁷ We do not believe this approach was reflective of OMB's interest in stakeholder feedback or its openness to alter its determinations based on stakeholder feedback.

Similarly, while the IWG did not attempt to compile and consider all of the scientific and economic studies relevant to estimating the SC-GHG that have been published since the 2016 TSDs, it is noteworthy that the Interim TSD did not include a single new study, comment, or analysis questioning whether the IWG's analytical framing decisions were too conservative or misapplied. Nor did the Interim TSD include any paper, study, or comment critical of the IWG's process for making these framing decisions. These criticisms do exist, and a rigorous analytical process compels their consideration, but by limiting its citation of papers published after the 2016 TSDs to the roughly 40 that the IWG viewed as in accord with the 2016 TSDs, the IWG seemingly suggests there are no dissenting views or credible bases to refrain from updating and reinstating the 2016 TSDs. Substantively, the absence of any discussion of or citation to critical or contradicting analysis or critical opinions may reflect that the IWG's SC-GHG estimation process is otherwise biased toward confirmation.

Even if it were acceptable to omit critical or contravening analyses from the Interim TSD itself, these papers and analyses should be made publicly available within an administrative record for the Interim TSD. Here, there is no docket at all. Stakeholders and putative commenters cannot view any other comments, studies, or analyses on the Interim TSD or any of the prior TSDs. Nor can we see how the IWG reviewed and responded to comments.⁵⁸ There is no way of knowing what sources were reviewed and disregarded by the IWG, and except for the citations in the TSD itself, there is no indication what evidence and analysis was considered at all. The IWG's process may well have utilized a much more open-ended, rigorous, and evidence-driven process, but until OMB establishes a docket, compiles a reasonably complete administrative record, and provides basic insights into the IWG and their deliberative processes, the public will have no way of knowing.

Additionally, it should be noted that the opportunity to provide comment to an agency when the SC-GHG is applied in rulemaking is not a suitable substitute for the need to engage directly with the IWG. In many cases, the agency applying the SC-GHG will have no greater insight into the

⁵⁷ See 86 Fed. Reg. at 24,669, published on May 7, 2021 requesting comment on the Interim TSD/estimates released on February 26, 2021.

⁵⁸ Stakeholders cannot even view the prior TSDs – those must be found on EPA's website.

work undertaken by the IWG or the intent underlying certain decisions throughout the process. Therefore, the agency will have no specified knowledge with which to respond to substantive comment on the SC-GHG estimate, and the IWG will not be required to contribute, thereby leaving response to comment entirely dependent on the published TSD.

Indeed, despite repeated inquiries, the public still knows almost nothing about the IWG other than the identity of the agencies and entities that make up the group. Simply noting the name of the agencies and entities with which the IWG members are affiliated is not particularly transparent because it provides the public no information about the IWG's membership, expertise, or potential biases and, therefore, the public has no capability to assess for itself the IWG's objectivity or qualifications.⁵⁹

The little we know about the IWG comes from a 2014 U.S. Government Accountability Office Report entitled "Regulatory Impact Analysis: Development of the Social Cost of Carbon Estimates" ("2014 GAO Report"),⁶⁰ which was largely based on interviews with unnamed "current and former federal officials or staff who participated in the working group on behalf of the [Executive Office of the President] offices and agencies named in the [2013 TSD]."⁶¹

The 2014 GAO Report reveals that "instead of being organized under a written agreement or other requirements," the IWG operated as "an informal interagency working group."⁶² The IWG has "no charter or other convening document."⁶³ And there is "no requirement that the [IWG] should document its activities or proceedings, including the meetings held or specific discussions that occurred at each."⁶⁴

The IWG "did not assign roles or responsibilities."⁶⁵ Rather, "different working group participants and agencies volunteered to take responsibility for various aspects of the development of the estimates that fell within their particular areas of expertise."⁶⁶

To develop its estimates the IWG "relied *largely* on existing academic literature and models . . ."⁶⁷ While the IWG "discussed . . . public comments during working group meetings," they did "not coordinate formally with other agencies on their reviews of comments received."⁶⁸

⁵⁹ Contrast this approach with the approach EPA employs when reviewing National Ambient Air Quality Standards ("NAAQS"). The Clean Air Scientific Advisory Board ("CASAC") serves an important advisory role in the NAAQS review process. The identity and qualifications of all of CASAC's members are publically available, as are their meeting notices, minutes, and reports. See <https://www.epa.gov/criteria-air-pollutants/process-reviewing-national-ambient-air-quality-standards> (accessed 6/16/2021).

⁶⁰ 2014 GAO Report, GAO-14-663 (July 24, 2014).

⁶¹ 2014 GAO Report at 3.

⁶² 2014 GAO Report at 11.

⁶³ 2014 GAO Report at 11.

⁶⁴ 2014 GAO Report at 11.

⁶⁵ 2014 GAO Report at 12.

⁶⁶ 2014 GAO Report at 12.

⁶⁷ 2014 GAO Report at 14 (emphasis added).

⁶⁸ 2014 GAO Report at 18.

“Members of the working group sometimes contacted researchers or developers of key data . . .”⁶⁹ For instance, “members of the working group consulted with lead authors of a chapter on climate sensitivity that appears in the *Fourth Assessment Report of the Intergovernmental Panel on Climate Change*.”⁷⁰ EPA also “spent a few days training with the developer of a second model” and “contracted with the developer of a third model to run the model according to the decisions reached by the working group.”⁷¹

According to the 2014 GAO Report, which is the most comprehensive description of the IWG that has been made available to the public, this is the process by which the IWG develops the SC-GHG estimates on which the federal government could potentially decide whether to impose billions, if not trillions of dollars in regulatory costs. If past is prologue, one can assume that the Interim SC-GHG estimates were developed by an *ad hoc* and informal group of individuals operating pursuant to no charter, no convening document, and no requirement to document their actions or proceedings. They met without providing public notice or producing minutes. One must assume that these unnamed individuals were not assigned any role or responsibilities in developing the Interim SC-GHG estimates, but perhaps voluntarily assumed responsibility for various aspects of the SC-GHG estimate. They presumably *largely* relied on existing academic literature, and while they cited those papers on which they relied in developing the Interim SC-GHG estimates, they did not document their data review or provide any indication that they considered critical or contravening views or approaches. And the IWG may have consulted and sought advice from outside experts, but did not disclose who. Nor did they document those consultations.

For sake of perspective, contrast the process that the Minnesota Public Utilities Commission (“PUC”) employed when it updated the SC-CO₂ it used for resource planning in the electric utility sector.⁷² While we do not endorse, and in fact disagree with, the PUC’s use of the SC-CO₂ in this application as well as the SC-CO₂ value ultimately selected by the PUC, we believe they employed a well-structured, fully-documented, and transparent process that sought out and considered a diversity of views and expert opinions. As described below, regardless whether we agreed or disagreed with the applicability of the SC-CO₂ estimates or the outcome of the PUC’s process, we could discern how decisions were made and on what basis.

When the PUC was petitioned to update its social cost values for CO₂ and other pollutants, it did not assign those updates to an unnamed and informal group operating outside of the public view. Instead, it ordered “a contested case proceeding . . . to fully consider . . . the CO₂ cost values,” and provided public notice of the hearing order.⁷³ Following referral to the Office of Administrative Hearings (“OAH”), the Administrative Law Judge (“ALJ”) conducted pretrial hearings with interested parties, ordered that multiple private entities be given full party status in

⁶⁹ 2014 GAO Report at 16.

⁷⁰ 2014 GAO Report at 16 (citing Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (S. Solomon, et al. [eds.]) (Cambridge, UK: Cambridge University Press, 2007)).

⁷¹ 2014 GAO Report at 16.

⁷² *In the Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statutes Section 216B.2422, Subdivision 3*, PUC Docket No. E-999/CI-07-1199 (2018).

⁷³ ALJ Findings of Fact at 3.

the matter, and issued an order setting forth detailed parameters for the evidentiary burden of proof.⁷⁴ As such, unlike the IWG's interim SC-GHG estimates, the PUC and ALJ encouraged stakeholder engagement *prior to* development of the estimates.

A docket was opened, and the OAH sought out and considered written comments from the public and testimony in a public hearing.⁷⁵ The public was provided notice of the hearing and their testimony was transcribed.

Public and private parties to the matter were given the opportunity to file expert reports and respond and reply to expert reports filed by others.⁷⁶ Many of the expert reports were written by highly esteemed scientists, modelers, and economists, including Dr. Richard Tol, developer of the FUND model.⁷⁷ These same experts served as witnesses at a weeklong evidentiary hearing that allowed each party to present their expert opinions and respond to the testimony provided by others.⁷⁸ And following the evidentiary hearing, the parties were permitted to submit an additional round of briefs that were based on the extensive analysis and evidence compiled through multiple rounds of comment, extensive expert testimony, and a robust exchange of views and ideas.⁷⁹

Thus, unlike the IWG's development process, the PUC's examination of the SC-CO₂ was formal, highly-structured, transparent, and publicly accessible through extensive notice and data availability. Reports, comments, transcribed testimony, and a wide range of papers and other relevant materials were readily assessable in an electronic docket. The ALJ's report summarized this record in excruciating detail, and described and responded to each party's analyses and opinions on the SC-CO₂ estimates, the IAMs, and the key inputs used in the models.⁸⁰ Indeed, the ALJ report extends for 140 pages and includes 433 findings of fact.⁸¹

This is the record on which the PUC selected the SC-CO₂ estimate it would use in resource planning decisions. And again, while we do not endorse this application of the SC-GHG estimate or the PUC's specific selection, we respect the structured, transparent, and rigorous process that the PUC employed to make that selection.

OMB surely understands the importance of the SC-GHG estimates the federal government may use in decision-making. OMB should also recognize that important governmental decisions should not be made behind closed doors by an unchartered and informal group of unknown individuals that have no obligation to document their proceedings. These individuals may have been imminently qualified and their approach to developing model inputs may have been rigorous, but we have no way of knowing.

⁷⁴ ALJ Findings of Fact at 4-5.

⁷⁵ ALJ Findings of Fact at 7.

⁷⁶ ALJ Findings of Fact at 7.

⁷⁷ See Appendix A to ALJ Findings of Fact: List of Parties and their Expert Witnesses.

⁷⁸ ALJ Findings of Fact at 7.

⁷⁹ ALJ Findings of Fact at 8.

⁸⁰ See ALJ Findings of Fact.

⁸¹ See ALJ Findings of Fact.

This is not how the government is supposed to operate. As it stands, the IWG's process undermines trust, foments group-think, and walls off analytical framing decisions from outside expertise and a diversity of views and opinions that could very well improve the IWG's decisions. We therefore urge OMB to develop the SC-GHG through a formal, structured, and transparent process, so that agencies can credibly do the same in using the SC-GHG.

c. Recommendations for improving IWG procedures

Subjective judgments and policy preferences are intrinsic to IAMs and therefore this source of uncertainty cannot be eliminated so long as the IWG relies on IAMs to develop the federal government's SC-GHG estimate. But this does not mean that the IWG's selection and use of these key model inputs cannot be improved. Indeed, because the product of the IAMs is so heavily driven by any given administrations' policy choices and judgements, the selection and use of these inputs must be conducted using the utmost transparency and objectivity. API therefore urges OMB and the IWG to adopt a formal and more structured SC-GHG estimation process that, at a minimum, includes the following elements:

- A structured and transparent process for timely implementation of the recommendations in NASEM 2017;
- Development of a robust electronic docket that includes relevant papers, all public comments regarding the SC-GHG estimates and their use in rules, each draft and final TSD developed by the IWG to date, data files for the models, records of outside communications, staff summaries, meeting minutes, and any other record relied on or relevant to the development of the SC-GHG estimates;
- Public comment opportunities based on a robust administrative record and which require the IWG to provide detailed responses to significant comments. As the IWG seeks to develop revised estimates, it is important to provide an opportunity to comment on new proposed values prior to finalization;
- Transparency with respect to the IWG, its membership, expertise, and decision-making process;
- Use of open meetings that provide stakeholders' sufficient notice and opportunities to testify. The IWG should provide agendas, lists of participants, meeting minutes, and transcription; and,
- Peer review of key model input decisions (discussed in Section 2(d) below).

d. The IWG should commit to meaningful peer review

The Interim TSD states that, "[g]oing forward the IWG commits to maintaining a consensus driven process for making evidence-based decisions that are guided by the best available science

and input from the public, stakeholders, and peer reviewers.”⁸² In order to meaningfully fulfill this commitment, the IWG must allow its modeling systems (models with inputs) and its estimates to be peer reviewed.

As OMB’s Final Information Quality Bulletin for Peer Review (“Peer Review Bulletin”) states, “[p]eer review is one of the most important procedures to ensure that the quality of published information meets the standards of the scientific and technical community.”⁸³ Further, President Obama’s 2009 Scientific Integrity Memorandum, which was recently reaffirmed by President Biden, instructs that “[w]hen scientific or technical information is considered in policy decisions, the information should be subject to well established scientific processes, including peer review . . .” OMB’s IQA Guidelines similarly recognize the critical importance of peer review in government decision-making, and point to the existence of peer review as providing a presumption of objectivity.⁸⁴

That versions of the IAMs were made available for peer review during the model development process, or utilized in papers that were themselves peer reviewed, is necessary and important as a representation of the integrity of those models, but is not sufficient. OMB indicates in its IQA Guidelines that the effectiveness of “journal peer review” is often “overstated,” and cites instances where flawed science was published in respected journals. These guidelines advised that, “[f]or information likely to have an important public policy or private sector impact, additional quality checks beyond peer review are appropriate.”⁸⁵

Even if publication of the IAMs in peer reviewed literature was sufficient to suggest that the models were peer reviewed, such review of the three models does not equate to peer review of the modeling systems (models plus inputs) employed by the IWG or the treatment of the model output. Indeed, it is this full spectrum of judgments and analytical framing decisions that constitute the SC-GHG estimates - and it is this full spectrum of judgments and decisions which must be peer reviewed.

The SC-GHG estimates and underlying modeling systems are precisely the type of influential scientific information envisioned in OMB’s Peer Review Bulletin when it admonished that “[m]ore rigorous peer review is necessary for information that is based on novel methods or presents complex challenges for interpretation. Furthermore, the need for rigorous peer review is greater when the information contains precedent-setting methods or models, presents conclusions that are likely to change prevailing practices, or is likely to affect policy.”⁸⁶ Importantly, the Peer Review Bulletin characterizes these as the “*minimum standards* for when peer review is required for scientific information. . . .”⁸⁷

⁸² Interim TSD at 36.

⁸³ Memorandum for Heads of Departments and Agencies from Josh B. Bolton, Director, OMB “Issuance of OMB’s ‘Final Information Quality Bulletin for Peer Review’” at 2 (Dec. 16, 2004).

⁸⁴ 67 Fed. Reg. at 377.

⁸⁵ IQA Guidelines at 2.

⁸⁶ Peer Review Bulletin at 12.

⁸⁷ Peer Review Bulletin at 7.

To be clear, accepting public comments is important, but not a substitute for peer review. OMB itself has noted that “[p]eer review should not be confused with public comment and other stakeholder processes.”⁸⁸

Nor did the NASEM’s review of IWG’s estimation procedures constitute peer review. For one, the NASEM’s charge was limited to evaluating and offering recommendations on the IWG’s estimation processes and procedures.⁸⁹ The NASEM did not review the estimates themselves or the model input decisions necessary to derive those estimates. Thus, despite multiple TSDs and updates to the SC-GHG estimates, the most critical components of the IWG’s SC-GHG estimation process have not been reviewed. This does not reflect analytical rigor or confidence in the IWG’s analytical framing decisions.

As it develops revised estimates, OMB and the IWG should subject the entire analysis, and the modeling systems it used, to peer review prior to finalizing new values. And, OMB and IWG should repeat this review process each time the IWG updates its SC-GHG estimates.

III. RECOMMENDATIONS FOR UPDATING THE SC-GHG

The IWG’s goal should be to develop a useful and durable SC-GHG that can aid in conducting cost-benefit analyses under E.O. 12866. As such, the IWG should consider from the outset how the SC-GHG may be used, and allow those anticipated uses to shape the manner in which the SC-GHG is estimated and presented. As noted above, we believe that the utility and durability of the federal government’s SC-GHG estimate will also depend on the analytical rigor and transparency with which the IWG develops the key inputs to the models used to derive the SC-GHG. Many of these key analytical framing decisions reflect judgment calls and policy preferences, and as the past several years have shown, changes to just a few of these judgments and policy preferences allow the exact same IAMs to produce drastically different SC-GHG estimates.

Indeed, the sensitivity of the IAM to unverifiable and subjective assumptions made by the modelers and model-users alike calls into question the reliability and reasonableness of the SC-GHG estimates they produce. As such, before the IWG examines changes to the manner in which it develops SC-GHG estimates, it should first recognize the limited usefulness of the SC-GHG estimates in conducting cost-benefit analyses, and it must realistically consider the suitability of the current SC-GHG to meet even those modest functions.

Further, as the IWG considers how to “work towards approaches that take account of climate risk, environmental justice, and intergenerational equity,⁹⁰” we urge consideration of the extent to which environmental justice and intergenerational equity considerations are already explicitly or implicitly included in other analytical choices (*e.g.* damage functions, discounting, geographic scope). The IWG should describe how these concepts manifest in its interim SC-GHG estimates,

⁸⁸ Peer Review Bulletin at 4.

⁸⁹ NASEM 2017 at 1.

⁹⁰ E.O. 13990 at Sec. 5.

as well as in any forthcoming estimates, and it should do so with respect to each of the analytical framing conclusions and judgements discussed in the subsections that follow.

For example, increasing the granularity of damage functions to account for damages at increasingly local scales may account for projected damages in regions potentially more likely to be disproportionately impacted, including lower income regions. Within certain impact sectors, choices about the income-elasticity across regions can affect how projected regional impacts are weighted. In addition, choices about discounting may explicitly or implicitly reflect intra-generational as well inter-generational inequality aversion.

Therefore, before the IWG endeavors to amend its subjective inputs and decisions in an attempt to account for environmental justice and intergenerational equity, we believe the IWG must first reasonably examine and describe the extent to which these concepts are already incorporated into/accounted for in the interim SC-GHG estimates and the extent to which such choices are consistent with one another. And as with all salient aspects of the development of the SC-GHG estimates, we believe the IWG should conduct this inquiry through a structured and transparent process that draws broadly on expert opinion and public input.

a. The IWG’s SC-GHG estimates primary utility is only with respect to broad considerations of costs and benefits of rules under E.O. 12866

As we have previously noted, the SC-GHG “was explicitly designed for agency use pursuant to E.O. 12866. . .”⁹¹ Consequently, the titles of each of the six TSDs the IWG published prior to the Interim TSD disclaimed that they were “for Regulatory Impact Analysis under Executive Order 12866.”⁹²

In contrast, the Interim TSD simply notes that the SC-GHG estimates are provided “under Executive Order 13990.”⁹³ E.O. 13990 directs all federal agencies to undertake innumerable actions to, *inter alia*, “reduce greenhouse gas emissions,”⁹⁴ and directs the IWG to “provide recommendations . . . regarding areas of decision-making, budgeting, and procurement by the Federal Government where the [SC-GHG] should be applied”⁹⁵ This request to consider expanded use of the SC-GHG is acknowledged in the Interim TSD,⁹⁶ and included in OMB’s request for comments.⁹⁷

This Administration’s interest in delinking the SC-GHG estimates from their intended use in cost-benefit analyses under E.O. 12866 is highly important and not subtle. President Biden has directed his agencies to undertake an unprecedented level of action to reduce GHG emissions

⁹¹ Palenik Z. (2020). The Social Cost of Carbon in the Courts: 2013-2019. New York University Environmental Law Journal, 28(3), 393-428.

⁹² See 2010 TSD; May 2013 TSD; May 2013 TSD (revised); November 2013 TSD; August 2016a TSD (for CO₂); and August 2016b TSD (for Methane and Nitrous Oxide).

⁹³ See, e.g., Title Page and Preface of Interim TSD.

⁹⁴ See E.O. 13990 generally; quoted text at Sec. 1.

⁹⁵ E.O. 13990 at Sec. 5(b)(ii)(C).

⁹⁶ Interim TSD at 14.

⁹⁷ 86 Fed. Reg. at 24,670.

and address climate change threats, and the extent to which federal agencies can justify aggressive and costly measures to abate GHG emissions will depend in large part on the magnitude of benefits attributed to those proposed measures. API agrees with the need to take action on climate change and we agree that agencies generally should weigh costs and benefits when considering such actions, however, we cannot support expanded use of the IWG’s SC-GHG estimates beyond their intended application in regulatory cost-benefit analysis.

The Electric Power Research Institute (“EPRI”) examined 65 federal rules and 81 subrules between 2008 and 2016 that utilized SC-CO₂ estimates in their regulatory analyses.⁹⁸ EPRI found that “the inclusion of benefits from policy-induced CO₂ emissions changes does not change the sign of net benefits. In other words, the net benefits are positive with and without consideration of CO₂ reduction benefits.”⁹⁹

Thus, while the broad range of uncertainty inherent in SC-GHG estimates would appear to preclude their use in most cost-benefit analyses, in practice, the estimates have been used in analyses in which the difference between costs and benefits was larger than the SC-GHG estimates’ range of uncertainty. This does not mean that the SC-GHG estimates were particularly useful to the analyses. Rather, it shows that, for those actions with non-climate benefits that are already estimated to exceed costs by a vast margin, the wide range of SC-GHG values will not matter. It also shows that there are mechanisms for incorporating uncertainty in cost-benefit analysis.

This is not the case with royalties, subsidies, fees, permits, or any other application that requires the SC-GHG to be expressed as a single value. Unlike analyses of actions in which the difference between non-climate benefits and costs is large enough to cloak the SC-GHG estimates’ expansive range of values, “when used in taxes and subsidies, SC-CO₂s directly determine policy outcomes, including GHG emissions and payments to and from energy producers and consumers.”¹⁰⁰

The extent of uncertainty and speculation that besets the IWG’s SC-GHG estimates precludes their reduction to a single value, be it a central value or otherwise. The SC-GHG estimates “were developed by the IWG with a methodology to fit the specific purpose of a benefits estimate to be added to a regulatory impact analysis . . .”¹⁰¹ “While a great deal of attention has been paid to dealing with uncertainty in the IAMs, the reality of this enterprise is that a high

⁹⁸ Rose, S and J. Bistline, “Applying the Social Cost of Carbon: Technical Considerations.” EPRI Palo Alto, CA: 2016. 300200f4659.

⁹⁹ Rose, S and J. Bistline, “Applying the Social Cost of Carbon: Technical Considerations.” EPRI Palo Alto, CA: 2016. 300200f4659.

¹⁰⁰ Kaufman, N. (2018). The Social Cost of Carbon in Taxes and Subsidies, Part 1: The Current Use of Estimates. Center for Global Energy Policy, Columbia SIPA (March 2018).

¹⁰¹ Kaufman, N. (2018). The Social Cost of Carbon in Taxes and Subsidies, Part 1: The Current Use of Estimates. Center for Global Energy Policy, Columbia SIPA (March 2018).

degree of uncertainty is baked in and cannot reasonably be estimated away.”¹⁰² At best, this methodology is capable of producing “a very wide range of potential” SC-GHG estimates.¹⁰³

In aggregate, the SCC estimates developed by the interagency working group and others represent a strange marriage of conventional economic-financial logic, arbitrary economic-financial logic, massively expansive biophysical phenomena, preference, and uncertainty management utilized to create a digestible input - a dollar amount - for use in the dominant cost-benefit analysis . . . framework.¹⁰⁴

Moreover, the subjective judgements that are necessary inputs into the IAMs make the product of those IAMs malleable. Indeed, the SC-GHG estimates “reflect ideology as much as they reflect the actual, long-term externality cost of climate change.”¹⁰⁵ Thus, “[f]or these assumptions, the tools of science, economics, or statistics are incapable of providing a ‘best’ or single value.”¹⁰⁶

[P]roducing a wide range of SC-CO₂ estimates is simply the best we can do using this methodology, and it is the best we will ever be able to do. The . . . Central SC-CO₂ is not an optimal price of CO₂ emissions or a best estimate of the benefits of CO₂ reductions. It is a noncomprehensive estimate of the benefits of GHG reductions using one set of assumptions that is arguably defensible given the theoretical and methodological challenges associated with the approach.¹⁰⁷

In addition to the methodological limitations precluding the use of the SC-GHG estimates in royalties, subsidies, fees, or applications that require a single value or narrow range of uncertainty, there are legal, statutory, and practical constraints on more expansive use of SC-GHG estimates as well. Indeed, courts have generally only upheld agencies’ use of the SC-GHG estimates in the context of cost-benefit analyses.¹⁰⁸

While a handful of cases have held that agencies must estimate the costs of GHG emissions when assessing impacts of their proposed actions under the National Environmental Policy Act (“NEPA”), the agencies’ impact assessments in those cases included cost-benefit analyses that

¹⁰² Taylor, A. (2018). Why the Social Cost of Carbon is Red Herring. *Tulane Environmental Law Journal*, 31(2), 345-372, 364-5.

¹⁰³ Kaufman, N. (2018). The Social Cost of Carbon in Taxes and Subsidies, Part 1: The Current Use of Estimates. Center for Global Energy Policy, Columbia SIPA (March 2018).

¹⁰⁴ Taylor, A. (2018). Why the Social Cost of Carbon is Red Herring. *Tulane Environmental Law Journal*, 31(2), 345-372, 348.

¹⁰⁵ Taylor, A. (2018). Why the Social Cost of Carbon is Red Herring. *Tulane Environmental Law Journal*, 31(2), 345-372, 369.

¹⁰⁶ Kaufman, N. (2018). The Social Cost of Carbon in Taxes and Subsidies, Part 1: The Current Use of Estimates. Center for Global Energy Policy, Columbia SIPA (March 2018).

¹⁰⁷ Kaufman, N. (2018). The Social Cost of Carbon in Taxes and Subsidies, Part 1: The Current Use of Estimates. Center for Global Energy Policy, Columbia SIPA (March 2018).

¹⁰⁸ Palenik, Z. (2020). The social cost of carbon in the courts: 2013-2019. *New York University Environmental Law Journal*, 28(3), 393-428, 416.

are not required by NEPA.¹⁰⁹ In other words, because the agencies there estimated quantified benefits of certain actions, they also had to estimate quantified costs including of GHG emissions. In many other cases, courts have held that agencies have no obligation to use the SC-GHG estimates in analyzing impacts under NEPA.¹¹⁰ Indeed, many of these courts took favorable views of agency determinations that SC-GHG estimates are ill-suited for NEPA analyses based on uncertainty ranges or otherwise.¹¹¹ Courts have generally taken a similar view to the Federal Energy Regulatory Commission's ("FERC's") position that the SC-GHG estimates' broad variability range makes them unsuited for public interest determinations¹¹² under the Natural Gas Act.¹¹³ And in the context of collecting royalties and other financial obligations related to the leasing, production, and sale of minerals from federal and Indian lands, the federal government is affirmatively prohibited from considering the SC-GHG estimates.¹¹⁴

Indeed, the SC-GHG estimates' broad range of variability render them inappropriate for use in any project-level or site-specific application. In addition, while analyses at these scales might be capable of monetizing some impacts (such as projected climate impacts), partial monetization is not advisable for several reasons. First, it could be interpreted as emphasizing or de-emphasizing the monetized impact, even though there is no basis on which to conclude that a monetized impact is more or less significant than a non-monetized impact. Second, monetized benefits and costs are only meaningful when they are compared to one another in aggregate.

These considerations illustrate the material distinction between formalized cost-benefit analysis in the regulatory context and other types of analysis. Whereas monetization is essential for regulatory analyses, it is potentially misleading outside this application for reasons discussed above. Notably, this material distinction is also embodied in E.O. 12866, which distinguishes between "regulatory actions" and "significant regulatory actions" based in part of the projected scale of impact.¹¹⁵ For each "significant" proposed action, the issuing agency is required to

¹⁰⁹ *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174,1181, 1184 (D. Colo. 2014); *See also Mont. Env'tl. Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1096-98 (D. Mont. 2017); *See also Palenik, Z.* (2020). The social cost of carbon in the courts: 2013-2019. *New York University Environmental Law Journal*, 28(3), 393-428, 415.

¹¹⁰ *See Wildearth Guardians v. Bernhardt*, No. 1:19-cv-00505-RB-SCY (D. N.M. Nov. 19, 2020); *See also 350 Montana v. Bernhardt*, 443 F. Supp. 3d 1185 D. Mont. 2020); *See also Citizens for a Healthy Cmty v. U.S. Bureau of Land Mgmt.*, 377 F. Supp. 3d 1223, 1239-40 (D. Colo. 2019); *See also WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 76 (D.D.C. 2019); *See also Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145, 1159 (D. Colo. 2018); *High Country Conservation Advocates v. Forest Service*, 333 F. Supp. 3d 1107 (D. Colo. 2018); *See also W. Org. of Res. Councils v. U.S. Bureau of Mgmt.*, No. CV 16-21-GFBMM, 2018 WL 1475470, at *13 (D. Mont. Mar. 26, 2018).

¹¹¹ *See Wildearth Guardians v. Bernhardt*, No. 1:19-cv-00505-RB-SCY (D. N.M. Nov. 19, 2020); *See also 350 Montana v. Bernhardt*, 443 F. Supp. 3d 1185 D. Mont. 2020).

¹¹² *See* Natural Gas Act, 15 U.S.C. § 717f(a), (c) (2012).

¹¹³ *See, EarthReports, Inc. v. Fed. Energy Reg. Comm'n*, 828 F.3d 949, 953-54 (D.C. Cir. 2016); *See also Sierra Club v. Fed. Energy Regulatory Comm'n*, 867 F.3d 1357, 1375 (D.C. Cir. 2017) (remanding to FERC for a discussion of whether it still holds the *EarthReports* position); *See also Sierra Club v. Fed. Energy Regulatory Comm'n*, 672 Fed. Ap 'x 38 (D.C. Cir. 2016).

¹¹⁴ *See Wyoming v. Jewell*, No. 2:16-CV-0285-SWS (Oct. 10, 2020); *See also* 86 Fed. Reg. 31,196, 31,206 (June 11, 2021).

¹¹⁵ *See* E.O. 12866 at Sec. 3.

provide a cost-benefit analysis. Thus, existing regulatory guidance essentially equates significance with the need for cost-benefit analysis, which in turn, implies full monetization of costs and benefits. While (as discussed above), there are inherent limits to the usefulness of the SC-GHG estimates in rulemaking, consideration of SC-GHG values is sensible in situations where all costs and benefits are monetized. Consideration of the SC-GHG estimates is not appropriate in instances where only a subset of impacts can be monetized so restricting its use to significant regulatory actions ensures consistency with this principle.

b. Role of subjective judgement in the IAMs and the IWG’s model inputs

There is broad recognition of the degree of scientific uncertainty associated with SC-GHG estimates, with the IWG’s calculations having taken especial pains to represent the scientific uncertainty in the equilibrium climate sensitivity (“ECS”) parameter when running each of the three IAMs. Indeed, this was the single scientific uncertainty that the IWG chose to introduce into the deterministic DICE model. The IWG chose to represent all other scientific uncertainties by using three separate IAM models, and simply letting their different choices of scientific assumptions other than the ECS parameter reflect the range of uncertainty on all other scientific unknowns. However, we note that SC-GHG estimates are subject to an equivalent amount of variance to several IAM input assumptions that are purely a matter of value judgments, neither scientific in nature nor amenable to empirical validation. Specific subjective input assumptions that have been demonstrated to have particularly large impact on the SC-GHG values are the choice of discount rate, the geographic scope of the damages to be calculated, the damage functions themselves, the length of the time horizon evaluated, and the choice of socioeconomic baseline emissions against which the damages from the incremental ton of GHG emissions are calculated.¹¹⁶

c. Sensitivity analysis of model inputs

The TSDs provide direct evidence of how extremely sensitive estimates of the SC-GHG are to the choice of discount rate, and many others have suggested use of an even wider range of potentially reasonable discount rate choices. For example, the IWG’s estimate of the emission-year SC-CO₂ varies from \$14 to \$76 using discount rates of 5% and 2.5%¹¹⁷, while the Trump Administration expanded the lower range of the global SC-CO₂ down to \$6 using the 7% discount rate required under Circular A-4 (but not reported in any TSD).¹¹⁸ Similarly, other researchers with the opinion that the discount rate must be lower than 2.5% have shown that even a 2% discount rate would cause this SC-CO₂ range to rise as high as \$125.¹¹⁹

¹¹⁶ See testimony of Dr. Anne Smith in the *Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statutes Section 216B.2422, Subdivision 3*, PUC Docket No. E-999/CI-07-1199 (2015).

¹¹⁷ Interim TSD at Table ES-1 (values are for emissions year 2020 in 2020 dollars).

¹¹⁸ See EPA RIA for Review of Clean Power Plan: Proposal (2017) at p. 168, reporting that the global SC-CO₂ value at 7% (for emissions year 2020, in 2011 dollars) was \$5/ton. Escalated to 2020 dollar using the GDP deflator, this would now be approximately \$6/ton.

¹¹⁹ Carleton, T and Greenstone, M. Updating the United States government’s social cost of carbon. Working paper no. 2021-04, Energy Policy Institute at the University of Chicago (January 2021), p.7.

These differences of opinion thus produce a range of over a factor of 20 in SC-CO₂ estimates before even starting to account for issues of scientific uncertainty. We believe that the IWG needs to put substantially more transparency into its deliberations on the alternative value judgments regarding discount rate, and directly think through the points about equity judgments that we offer in Section III.f below. We similarly recommend that the IWG be more thoughtful and transparent in its future SC-GHG deliberations about the other important value-laden input assumptions. For example, the table below compares the sensitivity of the SC-CO₂ values in the 2013 TSD to discount rate and three other non-scientific input assumptions. This sensitivity analysis was presented in expert testimony in the previously referenced Minnesota PUC case. We discuss issues related to each of the others in Sections III.d through III.g below.

Table 1. Numerical sensitivity of IWG’s SC-CO₂ estimates to variations in four input assumptions to the IWG’s IAMs (Values in \$/ton for year 2020 emissions in 2007 dollars, rounded to nearest dollar).¹²⁰

	<u>Lower Estimate</u>	<u>Higher Estimate</u>	<u>Comment</u>
1. Discount Rate 3% to 7%	\$5	\$42	Average of 5 IWG scenarios, varying discount rate only
2. Baseline emissions: 100% control to no new policies	\$28	\$42	Average of 5 IWG scenarios with 3% discount rate only
3. Time horizon: 2100 to 2300	\$22	\$42	Average of 5 IWG scenarios with 3% discount rate only
4. Scope: Domestic to global	\$7	\$42	Average of 5 IWG scenarios with 3% discount rate only
5. Combination of above 3 sensitivity cases	\$3	\$42	All cases using 3% discount rate only

d. Recommendation to further evaluate use of socioeconomic baselines that reflect no further emissions control policies

The IWG’s modeling of the SC-GHG had used five socioeconomic baseline projections, only one of which reflects any control of emissions beyond current global policies.¹²¹ The IWG constructed its “Fifth Scenario” by averaging several different socioeconomic projections of

¹²⁰ Source: Testimony of Dr. A. Smith in the Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statute § 216B.2422, Subdivision 3 (June 2015), Table 4, p. 31. (linked [here](#)).

¹²¹ See Interim TSD at 27.

policy outcomes to stabilize atmospheric concentrations at 550 ppm.¹²² Thus, four of the five baselines used by the IWG to date have involved emissions at a very high level. Given increasing marginal damages with higher temperature changes assumed in each of the IAMs, use of these baselines causes the IWG's SC-GHG estimates to be overstated compared to the values that the IWG is ostensibly seeking to develop for use in guiding climate policy via cost-benefit analysis.

The sensitivity analyses performed by Dr. Anne Smith, Managing Director and Co-Chair of NERA's Global Environmental Economics Practice, shown in row 2 of Table 1 above, provide an indication of how much lower the IWG's SC-CO₂ estimates might be if a baseline with additional controls is used. It shows that using a baseline with maximal controls of future emissions would reduce the IWG's 3% SC-CO₂ value from \$42/ton (2020 emissions in 2007\$) to \$28/ton.

The extent of overstatement suggested by Dr. Smith above is approximately 30%. This certainly undermines the utility of the IWG's SC-GHG estimates in cost-benefit analyses, but it may become an even more significant source of sensitivity if the IWG starts to incorporate greater nonlinearities and/or greater potential for catastrophic events into its IAM damage functions than those it has used thus far. For example, Nordhaus (2014) provides a numerical example comparing the SC-CO₂ estimated using a fixed "no-new-controls" emissions baseline (such as IWG uses for four of its five scenarios) with the SC-CO₂ estimated using an emissions trajectory that adjusts that initial baseline downwards to be consistent with implementation of policies to internalize that SC-CO₂.¹²³ (Dr. Nordhaus refers to the latter emissions trajectory as "optimized.") Using an hypothetical highly convex damage function, Dr. Nordhaus shows that an estimate of the marginal damage based on the fixed, no-new-controls emissions trajectory is \$1046/ton, while the same damage function produces a SC-CO₂ of \$54/ton when using the optimized emissions trajectory. Thus, there is a potentially very significant concern with the use of the no-control baseline emissions trajectories in future IWG efforts to estimate SC-GHG, especially if damage functions are substantially changed.

API takes no position on what the correct numerical emissions trajectory should be, but given the impact of the choice on estimates of the SC-GHG, we recommend that the IWG deliberate the appropriate choice for these trajectories more fully, openly, and with thorough sensitivity analysis. The IWG should also solicit expert review and analysis, and take public comment on decisions regarding the development and application of the socioeconomic baselines.

¹²² See 2010 TSD; See also testimony of Dr. Anne Smith in the Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statutes Section 216B.2422, Subdivision 3, PUC Docket No. E-999/CI-07-1199 (2018) at 32.

¹²³ Nordhaus WD. Estimates of the social cost of carbon: concepts and results from the DICE-2013R model and alternative approaches. JAERE Vol. 1, No. 1/2 (Spring/Summer 2014), pp. 273-312 <https://www.jstor.org/stable/10.1086/676035>. at p. 299.

e. **Recommendation regarding the effect of time horizon on the SC-GHG estimates**

Judgments of the socioeconomic baseline involve more uncertainties than that of the correct emissions assumptions. While there is little scientific question that a substantial fraction of the CO₂ emissions being emitted today may remain in the atmosphere for the next 300 years, API suggests that this is not, in itself, a reason for making estimates of SC-GHG over a multi-century baseline. Researchers (*e.g.*, Pindyck, 2014) have noted the enormous difficulty of projecting what society will need and value over such a long period into the future.¹²⁴ While reasonable numerical projections of future economic conditions might be possible by extrapolating from current rates of growth, as the IWG has done, any numerical estimate of the value that far future generations will ascribe to a given amount of change in any of today's productive processes or services is so speculative as to arguably have little reliability for guiding present decision-making.

Row 3 of the Table 1 above shows that at a discount rate of 3%, changing the IWG's time horizon from 2300 to 2100 reduces the IWG's SC-CO₂ estimate from \$42/ton to \$22/ton. Stated in another way, \$20/ton of the \$42/ton (*i.e.*, 48%) of that SC-CO₂ estimate is due to estimated damages that are only projected to occur after 2100. Smith (2015) also shows that 23% of the \$42/ton 2013 TSD's estimated SC-CO₂ would only occur after 2140, or more than 120 years in the future.¹²⁵ Dr. Smith's study also shows that the fraction of the total SC-CO₂ estimate attributable to the later years of the 300-year IWG modeling horizon becomes increasingly pronounced with lower discount rates. Thus, this issue will become even more important if the IWG considers use of lower discount rates in future estimates of the SC-GHG.

The NASEM identified this same issue, and recommended direct reporting of the fraction of each SC-GHG value contributed by damages during different time periods.¹²⁶ API concurs strongly with this recommendation. The IWG should therefore strive to be highly transparent about the extent to which its models' speculations about future social welfare values for future amounts of temperature change and/or sea level rise increase its estimates of the SC-GHG. API believes that the IWG should develop a structured and open process for making what amounts to a subjective policy decision about the length of IWG's modeling time horizon. Transparent processes, peer review, and public input are particularly important given that a substantial fraction (*e.g.*, more than about 10%) of the IWG's SC-GHG estimates are due to impacts beyond 80 and 120 years in the future. At a minimum, the IWG should report the fractions of each value due to damages projected to occur more than 80, more than 120 and more than 160 years in the future.

¹²⁴ Pindyck, R. S. (2013). "Climate Change Policy: What Do the Models Tell Us?" *Journal of Economic Literature* 51(3): 860-872.

¹²⁵ Dr. Smith MN PUC testimony, p. 79. Dr. Smith's expert report makes an evidence-based case that the ability to quantitatively estimate the value a future society will ascribe to goods and services that are deemed vulnerable to climate change today falls into the realm of speculation rather than evidence-based after about 80 to 120 years.

¹²⁶ NASEM 2017 p. 54, stating "It will be important, for analytic transparency and decision making, for the IWG to report the share of the SC-CO₂ accruing over different time horizons. Such reporting would provide a sense of the relative importance of very long-term impacts to the overall estimate."

API notes that the level of speculation implicit in projecting impacts on a 2300 time horizon is correlated with the choice of discount rate. That is to say, the speculative nature of the 2300 time horizon can be increased or decreased depending on the discount rate employed. While there is no obvious bright line for making adjustments to account for more speculative estimates, it will be useful for policymakers to be provided with insight about the degree of empirical reliability of estimates based on different discount rates.

f. Recommendation regarding the selection of an appropriate discount rate

The choice of discount rate has some empirical basis, but is ultimately a highly subjective, value-laden assumption. This is particularly the case for SC-GHG estimates, with their exceedingly long time horizons and intergenerational aspects. Circular A-4 recommends that RIAs provide estimates using both a 3% and 7% discount rate, using the same rate for both costs and benefits, respectively. Both of these rates have some empirical basis. The 3% rate is based on market measures of near zero-risk investments as an approximation of consumer's rate of time preference for consumption now vs. later. The 7% rate is based on market measures of the average before-tax rate of return on risky private investments in the U.S., reflecting the opportunity cost of capital. These have been developed for use in evaluating typical government policies that have a cost and benefit horizon of about 20 or fewer years. Circular A-4 recognizes the possibility for somewhat lower discount rates in very long-horizon situations, particularly where costs may accrue to different generations than those that benefit from the policy, such as for SC-GHG. This latter concern, often referred to broadly as "intergenerational equity," brings a much higher degree of value judgment rather than empirical consideration into the choice of discount rates for the SC-GHG estimates.¹²⁷

Some opine that it is unethical to discount the values of future generations more than those of the present, and therefore argue for very low discount rates relative to levels recommended in Circular A-4. An extreme version of this position was taken in the UK's *Stern Review* of 2007, which made the case for a 0.1% social rate of time preference on ethical grounds and used a typical growth model to estimate a social cost of carbon starting at about \$350/ton.¹²⁸ In an evaluation of that result, Nordhaus (2007) makes clear that appropriate use of the type of growth model on which both he and Stern rely allows (indeed requires) subjective value judgments regarding *both* rate of time preference and a utility function parameter called the consumption

¹²⁷ Carleton and Greenstone (2021) make a case for discount rates even lower than the lowest 2.5% used by the IWG by showing that US zero-risk real interest rates (*i.e.*, for US Treasury securities) have been lower in the past 20 years than they were in the 20 year period prior to that (p. 24). They also refer to other temporal downward trends in market interest rates. This view is based on a descriptive rather than prescriptive approach. While that approach may be more appealing to some parties than delving into value-laden arguments associated with the intergenerational discounting situation faced here, it is important to note that there is no way to circumvent the inherently subjective and prescriptive dimension of using optimal economic growth models to assess social cost of carbon. Nevertheless, we find little compelling in an argument for adopting very low discount rates of the past 20 years to apply for 300 years into the future. The authors present no reasons to believe that the lower risk-free rates of the past 20 years can reasonably be expected to be a change that will endure for 300 years, or reflect a relatively short-term fluctuation before the rates cycle back upwards.

¹²⁸ Stern, Nicholas (2007) *The economics of climate change: the Stern review*. Cambridge University Press, Cambridge, UK. ISBN 9780521700801.

elasticity.¹²⁹ The latter parameter, the choice of which is less often discussed, is also a value judgment; it describes the aversion of the social planner to unequal consumption across generations. Nordhaus further explains that these two value judgments cannot be made independently of each other because the combination of the two determines the equilibrium real return on capital.¹³⁰ Although the latter is endogenously calculated in the model, it is one of the more empirically-observable values associated with an IAM model run. Furthermore, any IAM analysis needs to generate a reasonably realistic (empirically justifiable) real return on capital if one is to expect climate policies relying on its resulting SC-GHG estimate to produce the desired emissions reduction investments. Nordhaus shows that the modeling in the *Stern Review* had failed to select an empirically justifiable combination. He shows that simply altering Stern's consumption elasticity to one that is empirically justifiable (when retaining the very low rate of time preference advocated by Dr. Stern), reduces Stern's SC-CO₂ estimate from about \$350/ton down to \$36/ton.

Thus, both of these model parameters affect how future consumption changes are discounted to a present value. While both are inherently subjective, they must be selected *together* in a manner that results in empirically reasonable implied rates of return to capital.¹³¹ A model run's internally-projected rates of return on capital should be checked for empirical realism before any reliability should be ascribed to the SC-GHG estimates that the model run produces.

The 2017 NASEM report also recommends use of the Ramsey framework for selecting a discount rate in future SC-CO₂ analyses, and notes the possible approach of choosing the two subjective parameters to match observed interest rates.¹³² However, we believe it would be important to more clearly acknowledge the perverse consequences of any SC-GHG analysis that fails to take this approach. For this reason we urge the IWG to thoughtfully consider the points made in Nordhaus (2007) that we have summarized above. At this time and given the short time OMB has allowed for public comment, API cannot provide a specific recommendation regarding the particular value judgments for those two parameters, but we believe their implications for model calibration to observable market rates warrant substantial discussion, public comment, and expert review before the IWG develops future SC-GHG estimates. And regardless of the parameters selected, they should be described in future TSDs using quantitative sensitivity analysis and an interpretive discussion of alternative parameter combinations that provide acceptable calibration.

¹²⁹ Nordhaus, William, D. 2007. "A Review of the *Stern Review on the Economics of Climate Change*." *Journal of Economic Literature*, 45 (3): 686-702.

¹³⁰ This relationship is the widely known Ramsey equation, in which $r = PTP + CE * g$, where r is the market-observable but model-endogenous real rate of return on capital, PTP is the assumed pure rate of time preference, CE is the consumption elasticity assumed in the social utility function, and g is the baseline projection of future growth rate for per-capita consumption. The growth rate is more of a scientific than ethical judgment implicit in each IAM model run, but must also be accounted for when making a coordinated selection of the two more ethically-informed parameters.

¹³¹ For example, a modeler's ethical judgment to use a relatively low rate of time preference will require a relatively high assumption aversion to inequality in consumption across different generations, and *vice versa*.

¹³² NASEM 2017 p.19 and Chapter 6.

API also notes that shifting to a Ramsey calibration of discounting will require that the actual discount rate become specific to each socioeconomic scenario, depending on its assumed rates of consumption per capita increase. This is a shift from past IWG methodology, which used exogenously specified constant discount rates. As Nordhaus (2014) explains, the IWG's methodology eliminated the utility function that each of the three IAMs used to value different levels of intergenerational consumption inequity its SC-CO₂ calculations.¹³³ Nordhaus (2014) notes that the IWG made an implicit assumption that “would be questionable if made explicitly”; to wit it made independent assumptions about growth and discounting whereas economic models would link the two.¹³⁴ Dr. Nordhaus points out that as a result, the IWG's scenarios' growth-corrected discount rates differ from scenario to scenario. He also points out that three of the five IWG scenarios have *negative* discount rates in the period 2000-2050 in the 2.5% discount rate calculations – a situation that can “induce unbounded present values if extrapolated.”¹³⁵

The above-referenced paper also points out that the correct discount rate within the utility-based calculation of SC-CO₂ will change over time as the per-capita consumption growth rate changes. Through DICE model sensitivity runs, Dr. Nordhaus shows that a constant discount rate that produces the same SC-CO₂ as the integrated (endogenous discounting) version of his DICE model is 4.2%.¹³⁶ This value is above the 3% discount rate that the IWG has emphasized in the Interim TSD and each prior TSD. This shows additional inconsistencies that arguments for various ethically-justifiable discount rates have had when the IWG has attempted to incorporate those rates as a constant level and outside of the standard utility-based growth models that were the original basis for estimating SC-GHG.

API therefore objects to any suggestion that the choice of discount rate in the context of the SC-GHG is not primarily a value or policy judgment – especially given the well-known fact that almost any implicit policy stringency that one may wish to see imposed can be justified by making one's case for either a higher or lower discount rate within the range that is already under active discussion (*e.g.*, from 1.5% to 7%). Again, given the short time OMB has allowed for comments, API presently cannot recommend that the IWG use one or more specific discount rates, but before the IWG promulgates revised SC-GHG estimates in 2022, we believe that the IWG must conduct a more structured, thoughtful, and public deliberation of the potential inconsistencies in some of the discount rate choices when applied within the IAM modeling framework. To that end, we make two additional observations about IAM projections that do not appear to have been discussed clearly by the IWG.

First, in two of the IAMs used by the IWG there is no feedback into the future consumption forecast of the model from the increasing regulatory costs that could be incurred. Any reduction in economic productivity resulting from the diversion of normal capital investments into compliance investments is thereby omitted in the calculation of future consumption, yet in practice, these compliance investments would likely reduce the baseline consumption due to the opportunity cost of capital.

¹³³ See Nordhaus (2014).

¹³⁴ Nordhaus (2014) at p. 297.

¹³⁵ Nordhaus (2014) p. 297.

¹³⁶ Nordhaus (2014) p. 296.

Second, the IWG should consider the intergenerational inequity that may be present as it relates to current generations, given the socioeconomic baselines employed in the SC-GHG calculations. The continued improvement of the social welfare of future generations as incorporated into the baseline scenarios appears to be inconsistent with the need to discount heavily and shift the burden largely to current generations. In addition to addressing the points made above, we believe the IWG should transparently consider, take public comment on, and solicit expert analysis of how these observations might be addressed in decisions regarding the range of discount rates to incorporate into future SC-GHG estimates.

g. Recommendation regarding the need to estimate the appropriate geographic scope of damages

In order to conduct a valid and legally-defensible cost-benefit analysis, agencies must ensure that they weigh costs and benefits of the same scale and of the same type. API is therefore recommending that the IWG present domestic SC-GHG estimates alongside global estimates. Indeed, we believe that, absent a clear congressional directive otherwise, agency cost-benefit analyses should be constructed to weigh domestic costs against domestic benefits. By doing so, agencies can better ensure that projected domestic impacts alone justify the costs to be imposed on domestic industries. When agencies have failed to do so and weighed domestic costs against global benefits, they have effectively put their thumb on the scale in favor of regulatory action. Such an analysis not only is inconsistent with basic economic principles but also ignores “the more prosaic commonsense notion that Congress generally legislates with domestic concerns in mind.”¹³⁷

Consider, for instance, the Clean Air Act (“CAA”).¹³⁸ In CAA Section 101(b)(1), Congress expressly stated that the statute’s purpose is 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*.”¹³⁹ By focusing on “the Nation” and “its population,” Congress clearly demonstrated that it enacted the CAA to affect domestic air quality.

This interpretation of the CAA is not new, nor does it fail to reflect the global nature of climate change. Indeed, EPA relied on this interpretation when it issued the highly important Endangerment Finding on which multiple federal climate change regulatory actions have been based.¹⁴⁰

In addition to the clear inferences that can be drawn from Congress’ statements of statutory intent, the text of specific provisions of the statute confirms that Congress intended to limit the reach of the Act to domestic effects, unless it expressly provided otherwise. In only two discrete instances, Congress explicitly addressed the foreign effects of domestic air emissions in the CAA.

¹³⁷ *RJR Nabisco, Inc. v. Eur. Cmty.*, 136 S. Ct. 2090, 2100 (2016).

¹³⁸ Given the transboundary nature of air pollution, this issues arises under the CAA most often.

¹³⁹ CAA § 101(b)(1) (emphasis added).

¹⁴⁰ See Final Rule, Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the CAA, 74 Fed. Reg. 66496, 66514 (Dec. 15, 2009) (“[T]he primary focus of the vulnerability, risk, and impact assessment is the United States”).

First, in Title I of the Act, Congress authorized EPA to consider the foreign effects of domestic air emissions within the delineated framework of Section 115. There, Congress defined the process for EPA to evaluate and address reports of domestic air pollution possibly affecting public health or welfare in a foreign country.¹⁴¹ Critically, this only applies when the Administrator finds there is “reciprocity” such that “the United States essentially [has] the same rights with respect to the prevention or control of air pollution occurring in that country as” Section 115 gives to the foreign country.¹⁴²

Second, in Title VI of the CAA, Congress addressed the global impacts of domestic stratospheric ozone emissions by, among other actions, listing ozone-depleting chemicals of concern, establishing reporting requirements for manufacturers and other entities, and phasing out the production of certain chemicals.¹⁴³ Congress expressly enacted Title VI in 1990 in order to implement the Montreal Protocol on Substances that Deplete the Ozone Layer, an international treaty signed by the United States, which addresses stratospheric ozone.¹⁴⁴

These two discrete provisions (Section 115 and Title VI) represent the full extent of EPA’s authority to consider the international benefits of domestic regulation. Critically, these provisions demonstrate that, when Congress chose to allow the Agency to consider foreign impacts of domestic regulation, it said so expressly. These two provisions also reflect the very narrow purpose for which Congress allowed EPA to consider foreign impacts of domestic regulation. Both provisions deal with international agreements under which the United States and one or more foreign nations make reciprocal commitments to impose regulations within their borders that confer benefits outside their borders and/or to the other party.

In these circumstances, the United States is the beneficiary of EPA’s action and also the foreign nation’s reciprocal regulatory action. As such, while foreign impacts are considered, their consideration is solely intended to inform regulatory decisions seeking to maximize domestic benefits of reciprocal regulatory actions. The executive branch has ample authority to act for the benefit of foreign nations, but the CAA is generally not one of the statutes that confers that authority. With the exception of these two discrete provisions, the CAA arguably prohibits EPA from weighing international benefits against domestic costs.¹⁴⁵

¹⁴¹ CAA § 115(a)-(b).

¹⁴² CAA § 115(c).

¹⁴³ EPA, 1990 CAA Amendment Summary: Title VI (Jan. 4, 2017), <https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary-title-vi>.

¹⁴⁴ 42 U.S.C. § 7671m(b) (“This subchapter as added by the CAA Amendments of 1990 shall be construed, interpreted, and applied as a supplement to the terms and conditions of the Montreal Protocol.”).

¹⁴⁵ Settled principles of statutory interpretation further confirm that Congress did not intend to authorize EPA to rely on the foreign effects of U.S. emissions in promulgating regulations under the CAA. For one, statutes are construed to give effect to all provisions. *See, e.g., Hibbs v. Winn*, 542 U.S. 88, 101 (2004) (“A statute should be construed so that effect is given to all its provisions, so that no part will be inoperative or superfluous, void or insignificant....”) (citations omitted). Section 115 would effectively be a nullity if EPA read the Act to provide the Agency with the authority to consider effects of domestic emissions on foreign countries without following the Section 115 process. Moreover, it is also a well-settled canon that if Congress addressed an issue in one provision, its failure to address that same issue elsewhere confirms its limited intent. *See, e.g., Russello v. United States*, 464 U.S. 16, 23 (1983) (“[W]here Congress includes particular language in one section of a statute but omits it in another section of the

While the foregoing example is specific to EPA and the CAA, OMB guidance applies these principles government-wide. In support of limiting the use of international benefits for justifying regulation, OMB directs agencies developing regulatory analyses to focus on the “benefits and costs that accrue to citizens and residents of the United States”¹⁴⁶ and directs agencies which “choose to evaluate a regulation that is likely to have effects beyond the borders of the United States” to report those impacts “separately.”¹⁴⁷ OMB’s guidance further states that an agency’s cost-benefit analysis “should focus on benefits and costs that accrue to *citizens and residents of the United States*.”¹⁴⁸

Notwithstanding that OMB Circular A-4 mandates agency consideration of domestic costs and benefits while simply allowing for optional consideration of non-U.S. benefits, as expressly directed by President Biden in E.O. 13990¹⁴⁹, the Interim TSD omits any calculation of domestic benefits. In lieu of this important, and in some instances mandated presentation of domestic benefits, the Interim TSD merely offers the IWG’s justification for its absence.¹⁵⁰ While these justifications are perhaps sufficient to support the IWG’s decision to present global benefits in the Interim TSD, none explain the IWG’s refusal to also present an estimate of domestic benefits alongside the global value.

For instance, the IWG argues that analyzing the global benefits of U.S. regulatory actions can help generate reciprocal actions from other countries and “allows the U.S. to continue to actively encourage other nations . . . to take significant steps to reduce emissions.”¹⁵¹ While this may be true, the IWG’s role is not to develop tools to aid in international negotiations or which help the U.S. “actively encourage” reciprocal actions on climate change; the IWG was charged with using the “best available economics and science”¹⁵² to estimate as accurately as possible the societal costs of adding a small increment of GHG into the atmosphere in a given year.¹⁵³ The IWG’s obligation to dispassionately and objectively estimate the SC-GHGs “using best available science and methodologies”¹⁵⁴ cannot be construed to encompass an advocacy role. And even if that were not the case, the Interim TSD provides no explanation why that advocacy role would be undermined by the presentation of domestic benefits *alongside global benefits*.

same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.”) (citations omitted).

¹⁴⁶ OMB, Circular A-4, at 15.

¹⁴⁷ OMB, Circular A-4, at 15.

¹⁴⁸ OMB, Circular A-4, at 15 (emphasis added).

¹⁴⁹ It is essential that agencies capture the full costs of greenhouse gas emissions as accurately as possible, *including by taking global damages into account.*” E.O. 13990 at Sec. 5(a)(emphasis added).

¹⁵⁰ See Interim TSD at 16-17.

¹⁵¹ See Interim TSD at 16.

¹⁵² E.O. 13990 at Sec. 5(b)(ii)(D).

¹⁵³ Interim TSD at 2.

¹⁵⁴ Interim TSD at Preface.

The IWG also offers that:

The global nature of GHGs means that U.S. interests, and therefore the benefits to the U.S. population of GHG mitigation, cannot be defined solely by the climate impacts that occur within U.S. borders.¹⁵⁵

Although it is true that the U.S. can be adversely impacted by climate change damages in other countries, it does not follow that the IWG must therefore include the *damages in those other countries* as part of the SC-GHG estimate. Rather, the IWG should include in the SC-GHG estimates the potential *domestic impact* of those projected extraterritorial climate damages. As explained by the NASEM:

Correctly calculating the portion of the SC-CO₂ that directly affects the United States involves more than examining the direct impacts of climate that occur within the country's physical borders . . . Climate damages to the United States cannot be accurately characterized without accounting for consequences outside U.S. borders.¹⁵⁶

In other words, regardless of whether climate change imposes costs on the U.S. directly or indirectly through damages in other countries, the costs the IWG should be attempting to characterize are those anticipated to be borne by the U.S. and its citizens. Thus, the global nature of climate change is consistent with and supported by the presentation of domestic benefits in the SC-GHG estimates. And the global nature of this issue certainly does not explain why the domestic benefits should not at least be presented alongside projections of global benefits.

The IWG's final rationale for declining to present domestic benefits alongside global values is that:

the development of a domestic SC-GHG is greatly complicated by the relatively few region- or country-specific estimates of the SC-CO₂ in the literature. At present, the only quantitative characterization of domestic damages from GHG emissions, as represented by the domestic SC-GHG, is based on the share of damages arising from climate impacts occurring within U.S. borders as represented in current IAMs.¹⁵⁷

The IWG has repeated this same refrain in the 2010 TSD, but did so within a discussion of how an agency might derive an estimate of domestic benefits from the TSD's global values.¹⁵⁸ All subsequent TSDs were entirely silent with respect to domestic benefits.

¹⁵⁵ Interim TSD at 15.

¹⁵⁶ NASEM 2017 at 52-53.

¹⁵⁷ Interim TSD at 15-16.

¹⁵⁸ "As an empirical matter, the development of a domestic SCC is greatly complicated by the relatively few region- or country-specific estimates of the SCC in the literature. One potential source of estimates comes from the FUND model. The resulting estimates suggest that the ratio of domestic to global benefits of emission reductions varies with key parameter assumptions. For example, with a 2.5 or 3 percent discount rate, the U.S. benefit is about 7-10

Although we agree that there is a high level of uncertainty in the regional or country-specific SC-GHG estimates, we believe it is inconsistent for the IWG to use this uncertainty to rationalize its decision to decline to provide any SC-GHG estimates other than global. Uncertainty and speculation pervade every aspect of the SC-GHG estimates, and the IWG should explain why such uncertainty provides a valid basis to decline to render estimates in this instance, but presents no barrier in every other respect.

It is also no longer accurate for the IWG to cite the overall paucity of literature on regional and country-specific SC-GHG estimates. As noted by the NASEM:

Estimation of the net damages per ton of CO₂ emissions to the United States alone, beyond the approximations done by the IWG, is feasible in principle; however, it is limited in practice by the existing SC-IAM methodologies . . .¹⁵⁹

Indeed, even Dr. Tol, the architect of the FUND model, looked beyond the IAMs to develop a greater understanding of regional and country-specific estimates of SC-GHG.¹⁶⁰ Others are working to develop these more granular SC-GHG estimates as well.¹⁶¹ While these country-specific estimates remain highly uncertain and divergent, they all broadly agree that the SC-GHG in the U.S. is a small fraction of the IWG's estimates of the global SC-GHG.

Although the SC-GHG estimates are uncertain, they are highly relevant because agencies should not adopt rules which could impose massive costs on the U.S., but for which the claimed benefits primarily accrue overseas—certainly not without a clear and explicit directive from Congress. The IWG's continued belief that rule writers and policymakers use only the global SC-GHG estimates in cost-benefit analysis results in a significant misalignment of costs and benefits.

As such, API's modest recommendation, which we have also previously voiced, is not that the IWG abandon the global SC-GHG estimates, but that it simply present domestic SC-GHG estimates alongside global values. This approach would allow risk managers to more readily align the costs with the benefits. Consistent with OMB guidance, the costs of a rule for entities in the U.S. should be presented in comparison with the benefits occurring in the U.S.

percent of the global benefit, on average, across the scenarios analyzed. Alternatively, if the fraction of GDP lost due to climate change is assumed to be similar across countries, the domestic benefit would be proportional to the U.S. share of global GDP, which is currently about 23 percent.

On the basis of this evidence, the interagency workgroup determined that a range of values from 7 to 23 percent should be used to adjust the global SCC to calculate domestic effects. Reported domestic values should use this range." (2010 TSD at 11).

¹⁵⁹ NASEM 2017 at 53.

¹⁶⁰ Richard S.J. Tol, A social cost of carbon for (almost) every country, *Energy Economics*, Volume 83, 2019, Pages 555-566,

¹⁶¹ See, e.g., Ricke, K., Drouet, L., Caldeira, K., Tavoni, M., 2018. Country-level social cost of carbon. *Nat. Clim. Change* 8 (10), 895–900. ISSN 1758-6798; See also Dell, M., Jones, B.F., Olken, B.A., 2014. What do we learn from the weather? The new climate-economy literature. *J. Econ. Lit.* 52 (3), 740–798; See also Burke, M., Davis, W.M., Diffenbaugh, N.S., 2018. Large potential reduction in economic damages under UN mitigation targets. *Nature* 557 (7706), 549–553.

IV. CONCLUSION

API appreciates the opportunity to provide these comments on the Interim SC-GHG and IWG's forthcoming process for developing a final SC-GHG in 2022. We hope this comment opportunity is the first step toward a more open and transparent process for developing the SC-GHG estimates and the judgment and assumptions used to develop and portray those estimates.

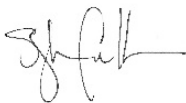
President Biden's issuance of E.O. 13990 on his first day in office reflects the importance of the SC-GHG estimates to our nation's climate policies and regulations. Given the importance of these estimates, these comments have strongly urged OMB and the IWG ensure that the SC-GHG estimates are developed through a transparent, formal, and structured process that provides stakeholders necessary information, solicits and meaningfully considers public comment, examines the opinions of experts as well as contravening views, and submits to peer review each of the subjective model inputs and assumptions that truly drive the output of the IAMs.

Where possible, API has tried to provide the IWG relevant analysis and constructive recommendations for improving the reliability and utility of the SC-GHG estimates. We did so, not only to improve the SC-GHG estimates and the process through which they are developed, but with the hope that by providing credible analysis and constructive feedback, OMB and the IWG would more fully recognize the benefit of developing the SC-GHG estimates through an open, data-driven, and collaborative process. API has likewise endeavored to do so in these comments.

API recognizes the need to confront the challenges of climate change and views economy-wide carbon pricing as an essential tool for doing so. However, we do not believe that the SC-GHG estimates provide the proper basis for establishing a price on carbon, and object to any use of the SC-GHG estimates that treats them as binding or dispositive given their failure to satisfy rulemaking requirements. The SC-GHG estimates and IWG processes are inherently related and relevant, and we therefore support any and all opportunities to meaningfully engage with OMB and the IWG in this effort.

Thank you again for your consideration of these comments. If you have any questions or would like to discuss these comments, please feel free to contact Stephen Comstock at 202-682-8455 or comstocks@api.org.

Sincerely,



Stephen Comstock

Vice President – Corporate Policy