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Union of  
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**To:** Federal Energy Regulatory Commission

**Submitted By:** Environmental Defense Fund, Food & Water Watch, Institute for Policy Integrity at New York University School of Law, Montana Environmental Information Center, Natural Resources Defense Council, Sierra Club, Union of Concerned Scientists

**Subject:** New Information and Additional Perspectives on Using the Social Cost of Greenhouse Gases to Weigh Climate Impacts in the Certification of New Interstate Natural Gas Facilities (Docket No. PL18-1-000)

The undersigned organizations respectfully submit the following comments,<sup>1</sup> which add new information and additional perspectives to our prior comments<sup>2</sup> to this docket, filed in July 2018, endorsing the Federal Energy Regulatory Commission's ("FERC" or "the Commission") use of the social cost of greenhouse gases in assessing permits for new natural gas transportation facilities.<sup>3</sup> Without duplicating our previous comments, this comment letter provides more recent support for the Commission's use of the social cost of greenhouse gases and offers additional suggestions in response to some of the Commission's questions from its Notice of Inquiry dated February 18, 2021.<sup>4</sup> A copy of our 2018 comments is also appended.

As detailed in our 2018 comment letter, and explained further herein, **monetization of climate impacts using the social cost of greenhouse gases provides the best approach for the Commission to assess the impacts of a proposal's greenhouse gas emissions and to compare those impacts to other beneficial and adverse project effects.** The social cost values developed and recently updated by the federal Interagency Working Group on the Social Cost of Greenhouse Gases ("Working Group") have been widely endorsed by independent experts and hailed by federal agencies as the best available estimates of climate damages. **Accordingly, the Commission should apply those valuations to monetize all greenhouse gas emissions (direct, upstream, and downstream) from a proposed project, and should update its valuation**

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<sup>1</sup> Our organizations may separately and independently submit other comments to this docket. This document does not purport to represent the views, if any, of New York University School of Law.

<sup>2</sup> This comment letter is signed by all of the organizations that signed the 2018 comment letter, plus two additional organizations.

<sup>3</sup> Evtl. Def. Fund et al., Using the Social Cost of Greenhouse Gases to Weigh the Climate Impacts of New Natural Gas Transportation Facilities in Environmental Analyses and in Reviews of Public Convenience and Necessity (July 25, 2018) (hereinafter "2018 Comments").

<sup>4</sup> FERC, Certification of New Interstate Natural Gas Facilities, 86 Fed. Reg. 11268 (Feb. 21, 2021), <https://www.federalregister.gov/documents/2021/02/24/2021-03808/certification-of-new-interstate-natural-gas-facilities>.

**estimates consistent with any future updates from the Working Group. The Commission should incorporate those social cost valuations into any determinations of whether, and on what conditions, to grant a certificate of public convenience and necessity.**

These comments also provide recommendations on how the Commission should assess the significance of climate impacts. **Because climate impacts can be expressed in monetary values using the social cost of greenhouse gases, this methodology allows the Commission to seamlessly consider climate impacts in the certificate process through comparison to the project's other monetized effects.** But however the Commission assesses climate effects, it must assess them consistently with project benefits.

### **I. Recent Developments Have Further Emphasized the Importance of Contextualizing Climate Impacts Using the Working Group's Social Cost of Greenhouse Gases Estimates**

As we explained in our previous comments, by 2018 the Working Group's social cost of greenhouse gases estimates had been widely applied by federal agencies,<sup>5</sup> endorsed by experts as representing the best available science and economics,<sup>6</sup> and upheld by a federal appellate court.<sup>7</sup> Caselaw at that time also supported the use of the social cost of greenhouse gases in reviews conducted under the National Environmental Policy Act ("NEPA").<sup>8</sup> These trends have only continued in the three years since, further emphasizing that the social cost of greenhouse gases remains the best methodology to assess the severity of a project's climate impacts.

Additional federal courts and independent authorities have since recognized that the Working Group's valuations are the best available estimates, and have at times struck down agency actions that failed to apply those valuations. Moreover, recent executive actions have restored the Working Group's estimates as representative of federal policy, and the Working

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<sup>5</sup> 2018 Comments at 12, 26 n.155 (citing Peter Howard & Jason Schwartz, *Think Global: International Reciprocity as Justification for a Global Social Cost of Carbon*, 42 COLUMBIA J. ENVTL. L. 203, 270-84 (2017) (listing all uses by federal agencies through July 2016)).

<sup>6</sup> *Id.* at 34 nn.208–09 (citing Gov't Accountability Office, *Regulatory Impact Analysis: Development of Social Cost of Carbon Estimates* 12-19 (2014); Nat'l Acad. Sci., Engineering & Med., *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide* 3 (2017) ["NAS 2017 Report"]; Nat'l Acad. Sci., Engineering & Med., *Assessment of Approaches to Updating the Social Cost of Carbon: Phase I Report on a Near-Term Update* 1–2 (2016) ["NAS 2016 Report"]).

<sup>7</sup> *Id.* at 25 (citing *Zero Zone v. Dept. of Energy*, 832 F.3d 654, 679 (7th Cir. 2016)).

<sup>8</sup> Relevant pre-2018 caselaw, discussed in the 2018 Comments, includes *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1216–17 (9th Cir. 2008) (rejecting analysis under NEPA when agency "quantifie[d] the expected amount of [carbon dioxide] emitted" but failed to "evaluate the incremental impact that these emissions will have on climate change or on the environment more generally," noting that this approach impermissibly failed to "discuss the *actual* environmental effects resulting from those emissions" or "provide the necessary contextual information about the cumulative and incremental environmental impacts" that NEPA requires); *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1190 (D. Colo. 2014) ("Beyond quantifying the amount of emissions relative to state and national emissions and giving general discussion to the impacts of global climate change, [the agencies] did not discuss the impacts caused by these emissions."); *Mont. Env'tl. Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1096–99 (D. Mont. 2017) (rejecting the argument that the agency "reasonably considered the impact of greenhouse gas emissions by quantifying the emissions which would be released if the [coal] mine expansion is approved, and comparing that amount to the net emissions of the United States").

Group has since reconvened and re-endorsed its prior estimates while commencing a process to update those estimates to incorporate the latest research.

### **A. Additional Precedent Supports the Use of the Working Group’s Social Cost Estimates in Project-Level Decisionmaking**

Over the past three years, numerous additional authorities have endorsed the use of the Working Group’s social cost metrics in administrative decisionmaking, including in project-level assessments conducted under NEPA. In particular, two federal court decisions and a report from the U.S. Government Accountability Office (“GAO”) have broadly endorsed the use of the Working Group’s valuations in agency decision-making.

Perhaps most relevant, two recent federal court decisions have added to growing list of cases concluding that mere quantification of greenhouse gas emissions and comparison to geographic inventories is insufficient under NEPA, and that an agency must more carefully assess a project’s incremental impact to climate change using available metrics such as the social cost of social greenhouse gases. First, in July 2020, the U.S. District Court for the Northern District of California rejected as insufficient a NEPA assessment of a regulation relaxing rules for methane flaring and leakage that only quantified emissions and compared them to nationwide totals, explaining that “framing sources as less than 1% of [national or] global emissions is dishonest and a prescription for climate disaster.”<sup>9</sup> As the court recognized, an agency “must communicate the *actual* environmental effects resulting from emissions of greenhouse gas, not just quantify them.”<sup>10</sup> And while the Court recognized that “NEPA does not mandate any particular methodology,” it explained that the statute requires “that an agency use state of the art science to make sound scientific decisions.”<sup>11</sup> The court highlighted the Working Group’s social cost of greenhouse gas estimates as a state-of-the-art methodology that would fulfill the agency’s duty under NEPA to assess climate impacts, rejecting the defendant agency’s argument that the tool was “too speculative” to apply.<sup>12</sup>

The U.S. District Court for the District of Montana reached a similar conclusion earlier this year, rejecting a NEPA assessment for a coal mine extension because the defendant agency simply quantified greenhouse gas emissions but did not evaluate climate impacts using the social cost of greenhouse gases. Specifically, the court held that because the agency “quantif[ied] the socioeconomic benefits of the mine expansion” being challenged, it must also “take a hard look at the costs of the greenhouse gas emissions” through the social cost of greenhouse gases.<sup>13</sup> The court rejected the defendant agency’s myriad reasons for rejecting the social cost metrics, holding that the tool is not too uncertain to apply in a NEPA analysis.<sup>14</sup> And finally, the court recognized the widespread “consensus that [the Working Group’s] estimates constitute the best available science about monetizing the impacts of greenhouse gas emissions,” and praised the methodology as a “viable model tool for monetizing the costs of greenhouse gas emissions.”<sup>15</sup>

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<sup>9</sup> *California v. Bernhardt*, 472 F. Supp. 3d 573, 623 (N.D. Cal. 2020).

<sup>10</sup> *Id.* (internal quotation marks and alterations omitted).

<sup>11</sup> *Id.* at 624.

<sup>12</sup> *Id.* at 623.

<sup>13</sup> *WildEarth Guardians v. Bernhardt*, No. CV 17-80-BLG-SPW, 2021 WL 363955, at \*9 (D. Mont. Feb. 3, 2021).

<sup>14</sup> *Id.*

<sup>15</sup> *Id.* at \*10.

Additionally, while the Trump administration disbanded the Working Group and instituted lower social cost of greenhouse gases values that purported to capture only domestic impacts—a move that has since been rescinded by the Biden administration, as detailed below—both a federal court and the GAO found that the Working Group’s global estimates nonetheless reflect the best available science and merit continued usage in agency decisionmaking. The court decision—from the U.S. District Court for the Northern District of California (in the same case as discussed above)—held that “focusing solely on domestic effects has been soundly rejected by economists as improper and unsupported by science.”<sup>16</sup> The court further explained that the domestic-only estimates relied upon by the defendant agency improperly “ignore[] impacts on 8 million United States citizens living abroad, including thousands of United States military personnel; billions of dollars of physical assets owned by United States companies abroad; United States companies impacted by their trading partners and suppliers abroad; and global migration and geopolitical security.”<sup>17</sup>

Similarly, in June 2020 the GAO published a report criticizing the federal government’s reliance on the domestic-only social cost of greenhouse gases estimates.<sup>18</sup> The GAO concluded that the integrated assessment models EPA used to derive its domestic-only estimates “were not premised or calibrated to provide estimates of the social cost of carbon based on domestic damages.”<sup>19</sup> The GAO further noted that the National Academies of Sciences found that country-specific social costs of greenhouse gases estimates were “limited by existing methodologies, which focus primarily on global estimates and do not model all relevant interactions among regions.”<sup>20</sup> Accordingly, the GAO found that the Working Group’s estimates—and not the Trump administration’s—were the appropriate figures for agencies to apply.

### **B. Executive Policy Once Again Endorses the Use of the Working Group’s Social Cost of Greenhouse Gases Estimates in Agency Decisionmaking**

Since President Biden took office in January 2021, his administration has reaffirmed the scientific and legal basis for the Working Group’s social cost valuations and committed federal agencies to applying those valuations in relevant actions. And while FERC is an independent agency, it should nonetheless follow this Biden-era executive guidance both because that guidance follows longstanding best practices and because doing so would be consistent with the Commission’s approach under the Trump administration.

On his first day in office, President Biden signed Executive Order 13,990 titled *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*.<sup>21</sup> Among other climate priorities announced therein, that Executive Order explained that “[i]t is essential that agencies capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account,” as “[d]oing so facilitates sound decision-making, recognizes the breadth of climate impacts, and supports the international

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<sup>16</sup> *California*, 472 F. Supp. 3d at 613.

<sup>17</sup> *Id.*

<sup>18</sup> GAO, SOCIAL COST OF CARBON: IDENTIFYING A FEDERAL ENTITY TO ADDRESS THE NATIONAL ACADEMIES’ RECOMMENDATIONS COULD STRENGTHEN REGULATORY ANALYSIS, GAO-20-254 (June 2020) [“GAO 2020 Report”].

<sup>19</sup> *Id.* at 29.

<sup>20</sup> *Id.* at 26.

<sup>21</sup> Exec. Order No. 13,990, 86 Fed. Reg. 7037 (Jan. 25, 2021).

leadership of the United States on climate issues.”<sup>22</sup> The Order reestablished the Working Group and called for it to publish interim social cost of greenhouse gases estimates within thirty days, to publish final estimates by January 2022, and to provide additional guidance by September 2021 on how the executive branch could make the best use of the social cost estimates including in “decision-making, budgeting, and procurement.”<sup>23</sup>

The Working Group released its interim social cost of greenhouse gases estimates in February 2021, restoring the values that the Working Group had previously developed (adjusted for inflation to present-day value).<sup>24</sup> The Working Group concluded that “these interim estimates represent the most appropriate estimate of the [social cost of greenhouse gases] until the revised estimates have been developed,” noting that the estimates were “developed using a transparent process, peer-reviewed methodologies, and the science available.”<sup>25</sup> The Working Group also dismissed the Trump administration’s domestic-only social cost valuations as failing to reflect “the best available science” and thus not “merit[ing] usage in agency decisionmaking.”<sup>26</sup> In doing so, the Working Group highlighted judicial caselaw rejecting the Trump-era numbers,<sup>27</sup> and provided conceptual arguments against those valuations that largely mirrored the arguments that we presented in our 2018 comments.<sup>28</sup>

Importantly, the Working Group also recognized that the social cost of greenhouse gases should apply to all “relevant agency actions,”<sup>29</sup> and not only regulations as the Commission has previously claimed.<sup>30</sup> In doing so, the Working Group specifically acknowledged that the social cost of greenhouse gases “has been used previously in non-regulatory Federal analysis, such as in . . . National Environmental Policy Act (NEPA) analysis,” and indicated that broad usage of the social cost metrics is appropriate beyond regulatory impact analysis.<sup>31</sup> The Working Group is expected to provide additional guidance on this issue by September 2021, but in the meantime agencies should use the social cost metrics in all relevant areas of federal decisionmaking. The Working Group’s recent guidance thus provides strong support for the use of its social cost valuations in project-level assessments under NEPA.

While the Commission is admittedly not an executive agency to which Executive Order 13,990 explicitly applies, the Commission should nonetheless follow the Biden administration’s guidance for at least three reasons. First, while executive orders typically do not bind independent agencies, NEPA and the caselaw interpreting it make no such distinction between

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<sup>22</sup> *Id.* § 5(a).

<sup>23</sup> *Id.* § 5(b).

<sup>24</sup> Interagency Working Group on the Social Cost of Greenhouse Gases, Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide – Interim Estimates Under Executive Order 13,990 (2021) [hereinafter “2021 TSD”].

<sup>25</sup> *Id.* at 3.

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> Compare *id.* at 14–17 (rejecting Trump-era arguments regarding global damages and discount rates) with 2018 Comments at 12–19, 28–33 (similar).

<sup>29</sup> 2021 TSD, *supra* note 24, at 14 (stating that social cost metrics should be used to “monetize[e] the value of changes in greenhouse gas emissions resulting from regulations and other relevant agency actions”).

<sup>30</sup> See, e.g., *Rio Grande LNG, LLC*, 170 FERC ¶ 61,046, at P 104 (Jan. 23, 2020) (claiming that while the social cost of greenhouse gases “may be useful for . . . rulemakings . . . , it is not appropriate for estimating a specific project’s impacts or informing our analysis under NEPA”).

<sup>31</sup> 2021 TSD, *supra* note 24, at 12.

independent and executive agencies. Accordingly, while FERC has not been the specific defendant in the caselaw holding that an agency’s failure to reasonably assess a project’s climate impacts using the social cost of greenhouse gases violates NEPA,<sup>32</sup> those cases counsel the Commission to apply the Working Group’s social cost metrics.

Second, following executive guidance by monetizing climate damages would be consistent with the Commission’s prior practice. Specifically, FERC in the recent past has cited an executive order from then-President Trump as part of its rationale for declining to apply the social cost of greenhouse gases.<sup>33</sup> Now that the federal government has revoked that Trump-era executive order and replaced it with an order that reinstates the social cost of greenhouse gases methodology and endorses its use throughout executive policymaking, FERC should similarly follow Executive Order 13,990 by assessing project-level climate impacts using the social cost of greenhouse gases. FERC follows other executive orders even when, as an independent agency, it is not explicitly bound by them.<sup>34</sup>

Third, several statutory provisions broadly call on all agencies, including independent agencies, to use the best available information in their analyses. Notably, a provision adopted in the Energy Policy Act of 2005 calls on all “[f]ederal agencies conducting assessments of risks to human health and the environment from energy . . . transport, transmission, distribution, storage, [and] use . . . [to] use sound and objective scientific practices in assessing such risks [and] . . . consider the best available science.”<sup>35</sup> Similarly, the Information Quality Act calls on all federal agencies to “maximiz[e] the quality” of the data they use in analyses that inform their decisions.<sup>36</sup> Because the social cost of greenhouse gases is the best available framework for assessing the climate risks from energy transport and use, the Commission should use these metrics both in its environmental impact statements and in its determinations of public necessity.

## **II. Consistent With Working Group Guidance, the Commission Should Apply a Central Discount Rate of 3% and a Sensitivity Range from 2.5%-5%, While Considering Further Analysis at Lower Discount Rates**

In its recent Notice of Inquiry, the Commission seeks guidance on what discount rates to use if applying the social cost of greenhouse gases. On this question, the Working Group has already spoken, endorsing a central discount rate of 3% along with a range of discount rates for sensitivity analysis. Like other agencies have in the past, the Commission should follow the Working Group’s lead.

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<sup>32</sup> See *supra* notes 8–17 and accompanying text.

<sup>33</sup> *Rio Grande LNG, LLC*, 170 FERC ¶ 61,046, at P 104.

<sup>34</sup> Fed. Energy Reg. Comm’n, East 300 Upgrade Project Eenvtl. Assessment 30 (Docket Nos. CP20-493-000) (2021) (assessing project’s contribution to noxious weed impacts in light of Executive Order 13,112 on Invasive Species, which also applied only to executive agencies, see 64 Fed. Reg. 6183 (Feb. 8, 1999)).

<sup>35</sup> 42 U.S.C. § 13557; Pub. L. 109-58, title XIV §1401, 119 Stat. 1061 (Aug. 8, 2005). “Federal agency” is not defined in the law. See *id.* But another provision of the Energy Policy Act of 2005, § 313(b), 119 Stat. at 689, refers to “action of a Federal agency (other than the [Federal Energy Regulatory] Commission)” —implying that FERC, an independent agency, is a “[f]ederal agency.”

<sup>36</sup> Information Quality Act § 515(a), 44 U.S.C. § 3516 note. The Information Quality Act applies to independent agencies and to policy analyses. See 67 Fed. Reg. 8452, 8453 (applying to all agencies subject to the Paperwork Reduction Act); *id.* at 8454, 8457 (applying to risk assessments and regulatory impact analyses).

As explained in our 2018 comments, the Working Group uses a 3% discount rate for its central social cost estimates, while also providing values for the social cost of greenhouse gases at discount rates of 2.5% and 5% for agencies to apply as additional values in sensitivity analyses. As we explained therein, numerous agencies have applied the Working Group’s full range of discount rates.<sup>37</sup> More recently, for instance, in January 2020 the Department of Energy assessed the impacts of a final regulation using the three recommended discount rate values for the social cost of carbon.<sup>38</sup> And in the NEPA context, among other examples, the Bureau of Ocean Energy Management has also applied the full range of discount rates to assess the climate effects of an offshore oil development plan, calling this range of estimates “a useful measure to assess the benefits of [carbon dioxide] reductions and inform agency decisions.”<sup>39</sup>

The Working Group’s recommended values also fall within a manageably narrow range. Under the inflation-adjusted values provided in the Working Group’s February 2021 guidance, the central estimate (i.e. 3% discount rate) is \$51 per metric ton of carbon dioxide emitted in the year 2020, while the range of values at the three suggested discount rates for year 2020 emissions spans from \$14–\$76.<sup>40</sup> In that recent update, the Working Group endorsed for interim use the discount rate range it had previously provided, and once again encouraged agencies to assess climate impacts using the full range.<sup>41</sup> Particularly since applying the social cost of greenhouse gases is so straightforward and simple—and therefore hardly any additional work is required to assess multiple social cost values—the Commission should follow the Working Group’s guidance and apply discount rates of 2.5–5%, using 3% as the central estimate. However, if the Commission would prefer to use only a single social cost value, it should apply the Working Group’s central estimate (currently set at 3%).

While the Working Group has now endorsed its prior range of discount rates for immediate use, it explained in its February 2021 technical support document that there is considerable evidence that intergenerational consumption discount rates are actually well below 2.5%, potentially in the range of 1-2%.<sup>42</sup> For this reason, the Working Group acknowledged that its social cost valuations “likely underestimate societal damages from [greenhouse gas] emissions.”<sup>43</sup> The Working Group will evaluate the discount rate (among other issues) as it performs a full assessment of its social cost valuations to reflect the latest scientific and economic research—a task that it intends to complete, as noted above, by January 2022. When the Working Group releases its updated estimates at that time, the Commission should apply those estimates rather than the current ones.

In the meantime, the Working Group recognized that “agencies may consider conducting additional sensitivity analysis using discount rates below 2.5%” to reflect this growing body of

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<sup>37</sup> 2018 Comments at 10.

<sup>38</sup> Energy Conservation Program: Energy Conservation Standards for Uninterruptible Power Supplies, 85 Fed. Reg. 1447, 1478–79 (Jan. 10, 2020).

<sup>39</sup> BOEM, *Liberty Development Project: Draft Environmental Impact Statement* 3-129, 4-247 (2017).

<sup>40</sup> The Working Group also provides a value of \$152, which represents 95<sup>th</sup> percentile damage estimates. 2021 TSD, *supra* note 24, at 5.

<sup>41</sup> *Id.* at 4 (“At this time, the IWG has determined that it is appropriate for agencies to revert to the same set of four values drawn from the SC-GHG distributions based on three discount rates (2.5 percent, 3 percent, and 5 percent) as were used in regulatory analyses between 2010 and 2016 and subject to public comment.”).

<sup>42</sup> *Id.* at 16–21 (surveying literature).

<sup>43</sup> *Id.* at 4.

evidence on intergenerational discounting.<sup>44</sup> Consistent with that guidance, the Commission should also consider additional sensitivity analysis using discount rates lower than 2.5%.<sup>45</sup> To do so, the Commission could look to the “value of carbon” estimates from the New York State Department of Environmental Conservation (“DEC”), which applied a 2% discount rate as its central value to reflect recent evidence from the U.S. bond market and academic research on discount rates.<sup>46</sup> Pursuant to DEC’s estimates, at a discount rate of 2% social cost valuations for year 2020 emissions equal \$125 per ton of carbon dioxide, \$2,782 per ton of methane, and \$44,727 per ton of nitrous oxide.<sup>47</sup>

### **III. Monetized Estimates Readily Facilitate Comparison to Economic Benefits, Whereas Other Metrics Can Misleadingly Trivialize Climate Impacts If Not Properly Contextualized**

While the social cost of greenhouse gases is not the only available metric for assessing climate impacts, it is by far the best for facilitating reasoned decisionmaking.

For one, while FERC has frequently alleged that “there is no standard established by international or federal policy, or by a recognized scientific body that the Commission could rely on in determining whether project-specific GHG emissions are significant,”<sup>48</sup> application of the social cost of greenhouse gases helps solve this problem. Whereas the relative significance of, for instance, 20,000 additional tons of carbon dioxide per year versus 2 million additional tons per year may be somewhat challenging to discern because such emissions tallies cannot be easily compared to other project impacts, the relative significance of \$1 million per year in climate damages versus \$100 million per year in climate damages is more salient and easier to discern because it is presented in the common metric of money—a metric that an economic regulator like the Commission is very familiar with and routinely uses to measure other project impacts.

In particular, the Commission typically presents various socioeconomic impacts such as rates, payroll, and tax revenues in dollar figures.<sup>49</sup> The Commission could also monetize the benefits, if any, that it claims from additional gas supply or consumer cost effects.<sup>50</sup> Monetizing climate damages would facilitate easy comparison to those impacts and thus enable the Commission to rationally “balanc[e] the evidence of public benefits to be achieved against the

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<sup>44</sup> *Id.* at 21.

<sup>45</sup> *Id.* at 4 (“Consistent with the guidance in E.O. 13990 for the IWG to ensure that the SC-GHG reflect the interests of future generations, the latest scientific and economic understanding of discount rates discussed in this TSD, and the recommendation from OMB’s Circular A-4 to include sensitivity analysis with lower discount rates when a rule has important intergenerational benefits or costs, agencies may consider conducting additional sensitivity analysis using discount rates below 2.5 percent.”).

<sup>46</sup> N.Y. Dep’t of Env’tl. Conserv., *Establishing a Value of Carbon: Guidelines for Use by State Agencies* 16–18 (2020), available at [https://www.dec.ny.gov/docs/administration\\_pdf/vocfguid.pdf](https://www.dec.ny.gov/docs/administration_pdf/vocfguid.pdf).

<sup>47</sup> *Id.* at 3. *See also* N.Y. Dep’t of Env’tl. Conserv. & Res. for the Future, *Estimating the Value of Carbon: Two Approaches* (2020) (explaining considerations and methodology).

<sup>48</sup> Certification of New Interstate Natural Gas Facilities, 83 Fed. Reg. 18,020, 18,029 (Apr. 25, 2018); *accord Rio Grande LNG, LLC*, 170 FERC ¶ 61,046, at P 104 (“[T]here are no established criteria identifying the monetized values that are to be considered significant for NEPA reviews”).

<sup>49</sup> *See, e.g.*, FERC, *Atlantic Coast Pipeline and Supply Header Project Final Environmental Impact Statement* 4-508 to 4-509 (2017) (estimating spending, income tax, and property tax revenues in dollar figures) [hereinafter “Atlantic Coast Pipeline EIS”].

<sup>50</sup> Avi Zevin, *Regulating the Energy Transition: FERC and Cost-Benefit Analysis*, 45 COLUM. J. ENVTL. L. 504–07 (2020) (detailing how FERC could monetize these benefits).

residual adverse effects” as part of the certification assessment.<sup>51</sup> If, for instance, the climate damages exceed monetized project benefits, then the Commission can easily determine that the project is not in the public interest. If monetized climate damages and other monetized economic, environmental and health effects do not together exceed project benefits, the Commission should then consider whether other costs of the project—including the monetized costs of construction, operation, and eminent domain along with any significant but non-monetized climate, health, environmental, and social effects—make up for the difference and thus still make the project net costly on the whole.

Indeed, as discussed above and in our 2018 comments, several federal courts have held that it is arbitrary and capricious for an agency to monetize a project’s economic impacts but fail to monetize its climate costs using the social cost of greenhouse gases.<sup>52</sup> As these courts recognize, monetizing only beneficial economic impacts without monetizing climate impacts presents a skewed picture that inappropriately tips the scales in the applicant’s favor.<sup>53</sup> Monetizing climate impacts, in contrast, allows for easy comparison and thereby facilitates a rational and transparent assessment of whether the project is in the public interest.

The other methods for assessing climate significance on which the Commission seeks comment—comparing the project’s emissions to international, state, or regional carbon budgets; or assessing geophysical impacts such as increases in carbon dioxide levels, global temperatures, or sea levels—are far less helpful on this front, and without proper context and assessment, could misleadingly trivialize a project’s climate impacts. This is because percentage comparisons or physical impacts tend to appear fairly small without further analysis, and agencies have frequently brushed aside substantial climate impacts presented in these fashions without performing the additional analysis needed. Furthermore, because these techniques do not present impacts in a common metric like dollars, they cannot be readily compared to economic impacts as part of the Commission’s certification assessment. While these two techniques (percentage comparisons and geophysical assessments) may provide some helpful information to supplement the Commission’s assessment, the social cost of greenhouse gases would still be necessary to assess climate impacts in a manner that is salient, comparable to other effects, and amenable to analyzing public convenience and necessity.

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<sup>51</sup> *Rio Grande LNG, LLC*, 169 FERC ¶ 61,131, at P 28 (Nov. 28, 2019) (“[I]n deciding whether to authorize the construction of major new pipeline facilities, the Commission balances the public benefits against the potential adverse consequences.”).

<sup>52</sup> *High Country Conservation Advocates*, 52 F. Supp. 3d at 1191 (finding it “arbitrary and capricious to quantify the *benefits* of the lease modifications and then explain that a similar analysis of the *costs* was impossible when such an analysis was in fact possible,” recognizing that to support a decision on coal mining activity, the defendant agency had “weighed several specific economic benefits—coal recovered, payroll, associated purchases of supplies and services, and royalties”); *Mont. Envtl. Info. Ctr.*, 274 F. Supp. 3d at 1096–99 (holding it was arbitrary for the agency to quantify benefits in an environmental impact statement while failing to use the social cost of carbon to quantify costs); *WildEarth Guardians*, 2021 WL 363955, at \*9. See also 2018 Comments at 8–9 (citing relevant precedent that “climate effects must be monetized if other costs and benefits are monetized”).

<sup>53</sup> See generally *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1113 (D.C. Cir. 1971) (NEPA mandates a rather finely tuned and systematic balancing analysis” of “environmental costs” against “economic and technical benefits”) (internal quotation marks omitted); *Chelsea Neighborhood Ass’n v. U.S. Postal Serv.*, 516 F.2d 378, 386 (2d Cir. 1975) (“NEPA, in effect, requires a broadly defined cost-benefit analysis of major federal activities.”); *Sierra Club v. Sigler*, 695 F.2d 957, 978–79 (5th Cir. 1983) (holding that NEPA “mandates at least a broad, informal cost-benefit analysis,” and so agencies must “fully and accurately” and “objectively” assess environmental, economic, and technical costs).

Starting with percentage comparisons to geographic climate targets or inventories, this practice frequently makes massive amounts of emissions from an individual project or action seem relatively small when misleadingly compared to a far larger baseline denominator. As one federal court recently recognized, “[t]he global nature of climate change and greenhouse-gas emissions means that any single ... project likely will make up a negligible percent of state and nation-wide greenhouse gas emissions.”<sup>54</sup> Yet while agencies assessing percentage comparisons of greenhouse gas emissions should recognize this phenomenon and adjust their standards accordingly, agencies in the past have frequently fallen victim to probability neglect—the cognitive tendency to improperly trivialize small probabilities.<sup>55</sup> In other words, agencies all too often fail to recognize, as one federal court explained, that even a seemingly “very small portion of a gargantuan source of ... pollution” may “constitute[] a gargantuan source of ... pollution on its own terms.”<sup>56</sup>

In one recent NEPA assessment, for instance, the Office of Surface Mining deemed a proposal’s carbon dioxide emissions “small” because they comprised 0.44% of the annual global total.<sup>57</sup> Yet closer inspection reveals that 0.44% of annual global emissions is actually a massive volume. In fact, application of the social cost of greenhouse gases reveals that projected emissions from this proposal would cause roughly \$8.8 billion in annual climate harm.<sup>58</sup> Presenting climate impacts as a monetized, concrete value, rather than as a small percentage of global totals, likely would have triggered closer evaluation from the agency and allowed for a more careful comparison to the project’s economic benefits.

Not surprisingly, moreover, 0.44% of other massive global impacts also yields gargantuan impacts. To provide an illustrative analogy, 0.44% of global gross domestic product equals \$385 billion<sup>59</sup> (far and away greater than the projected economic impacts of that proposal). Likewise, 0.44% of global annual deaths equals roughly 250,000 fatalities.<sup>60</sup> If an agency’s proposal stood to cause 250,000 deaths—or to cause \$385 billion in economic costs or benefits—it would be absurd for the agency to cast aside this impact as “minor” because the impact represents less than 1% of the global total. But presenting those impacts as a small percentage of global totals creates the possibility for that result, and is thus not the most useful way to convey these highly significant impacts without further context.

The Commission too has fallen victim to this fallacy. In a recent Certificate Order for the Rio Grande LNG Project, for instance, the Commission classified the project’s operational emissions as contributing the equivalent of 0.17% of national emissions, and then failed to factor

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<sup>54</sup> *WildEarth Guardians v. Bureau of Land Mgmt.*, 457 F. Supp. 3d 880, 894 (D. Mont. 2020).

<sup>55</sup> See Cass R. Sunstein, *Probability Neglect: Emotions, Worst Cases, and Law*, 112 YALE L.J. 61 (2002).

<sup>56</sup> *Sw. Elec. Power Co. v. EPA*, 920 F.3d 999, 1032 (5th Cir. 2019) (internal quotation marks omitted).

<sup>57</sup> Bull Mountains Mine No. 1 Federal Mining Plan Modification Environmental Assessment D-2 (2018).

<sup>58</sup> This project was expected to result in the release of approximately 190 million tons of greenhouse gases, *id.* at 56, which equals about 172.36 million metric tons. Using the central social cost of carbon estimate of \$51 per metric ton emitted in the year 2020, this amounts to \$8.79 billion in climate harm for 2020 emissions.

<sup>59</sup> Global gross domestic product was \$87.7 trillion in the most recent fiscal year. GDP (current US\$), WORLD BANK, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD> (last visited May 13, 2021). \$87.7 trillion multiplied by 0.0044 (i.e., 0.44 percent) equals \$385.88 billion. The gross domestic product of Ireland is \$388.7 billion. *Id.*

<sup>60</sup> World Population Prospects: Deaths—Both Sexes, UNITED NATIONS (2019), <https://population.un.org/wpp/Download/Standard/Mortality/> (showing annual global fatalities of 57.2 million).

these emissions into its consideration of public convenience and necessity.<sup>61</sup> In fact, the project's over 9 million tons of annual operational emissions<sup>62</sup> produces more than \$450 million in yearly damage costs using the Working Group's central valuation of the social cost of carbon. Had the Commission applied the social cost of greenhouse gases rather than rely solely on percentage comparisons, it would have been able to compare the project's climate costs to its purported economic benefits and seamlessly integrated climate impacts into its certification assessment.

The Commission also selectively applies this percentage-comparison approach to greenhouse gas emissions. Other quantified impacts, such as payroll or employment projections, could also be presented as miniscule percentages of global, national, or statewide totals. For instance, if FERC had presented the \$69.2 million in estimated annual spending from the Atlantic Coast Pipeline<sup>63</sup> as just 0.000003% of U.S. gross domestic product<sup>64</sup> or just 0.0000007% of global gross domestic product,<sup>65</sup> then it too may have brushed these impacts aside as negligible. By presenting greenhouse gas emissions only as miniscule percentages of larger totals, while measuring beneficial project impacts without resorting to this misleading approach, the Commission makes it difficult to accurately balance project impacts.

Comparison to geographic targets or inventories is suboptimal for another reason: Because different geographic areas have different targets or baseline emissions, but greenhouse gases accumulate globally, changing the denominator to reflect the location of the proposal would improperly shrink or expand the project's apparent significance. For instance, a certain amount of emissions assessed against one state's less ambitious target will appear as a smaller percentage than if that same amount of emissions is compared against another state's more-ambitious target.<sup>66</sup> Unless the Commission applies a consistent benchmark for all analyses, it will fail to preserve an apples-to-apples comparison and arbitrarily prioritize projects in certain geographic areas.

Simply presenting a project's physical impacts without using the social cost of greenhouse gases to assess the harm from those effects is not the best way to assess climate impacts for the same essential reason: that the impacts of any single proposal may misleadingly appear small without proper context. Because climate change is a global phenomenon with individually subtle yet collectively colossal impacts, a single project may not affect global temperatures or sea levels by more than a very small amount. Yet even seemingly small geophysical effects can have massive reverberations on a global scale. Unfortunately, the few times that agencies have assessed climate impacts in this fashion, they have tended to erroneously trivialize substantial effects.

In a recent assessment under NEPA, for instance, the National Highway Traffic Safety Administration ("NHTSA") declared that a fuel-economy regulation's climate impacts would be "very small" because the regulation was expected to cause an increase in global mean surface

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<sup>61</sup> *Rio Grande LNG, LLC*, 169 FERC ¶ 61,131, at P 108.

<sup>62</sup> *Id.*

<sup>63</sup> Atlantic Coast Pipeline EIS, *supra* note 49, at 4-508 tbl.4.9.8-2.

<sup>64</sup> U.S. gross domestic product was \$21.4 trillion in the most recent fiscal year. GDP (current US\$), WORLD BANK, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD> (last visited May 13, 2021).

<sup>65</sup> Global gross domestic product was \$87.7 trillion in the most recent fiscal year. *Id.*

<sup>66</sup> *See Fla. Se. Connection, LLC*, 162 FERC ¶ 61,233, at P 28 (Mar. 14, 2018) (recognizing that using regional comparisons "as a benchmark for significance ... is problematic" because the same quantity of emissions may appear "widely different" simply by changing the denominator from a state to a regional inventory).

temperatures “of no more than 0.016 °C by 2100.”<sup>67</sup> Relying on the seeming meagerness of this temperature increase, the agency did not perform further analysis of the rule’s climate impacts. Yet as another analysis revealed by applying the social cost of greenhouse gases, this seemingly minor temperature increase actually translated into approximately \$142 billion in total climate harm.<sup>68</sup>

Accordingly, the social cost of greenhouse gases is the best method for the Commission to assess climate impacts. If the Commission chooses to also employ an assessment of physical impacts or percentage comparisons, such analyses should be presented as a supplement to use of the social cost of greenhouse gases and should be properly contextualized to avoid misleading readers and decisionmakers, as explored further in the next section.

#### **IV. The Commission Should Not Disregard Any Climate Impacts, But Rather Should Rationally Weigh All Climate Impacts Alongside Other Project Effects**

Because application of the social cost of greenhouse gases enables the Commission to monetize any level of climate impacts, compare them to monetized project benefits, and assess appropriate mitigation measures, the Commission should apply the social cost of greenhouse gases to any amount of quantified emissions and consider those climate impacts when assessing whether, and on what terms, to approve a project application. Accordingly, the Commission should assess the climate impacts of any proposal no matter how large or small. And insofar as the Commission applies significance thresholds to climate impacts, it should set those thresholds at a low level commensurate with its treatment of project benefits.

##### **A. The Commission Should Apply the Social Cost Metrics to Any Quantified Amount of Greenhouse Gas Emissions**

As discussed above, a key reason to use the social cost of greenhouse gases is to allow for an apples-to-apples comparison to project benefits by providing climate costs in the common metric of money. While some proposals will obviously produce more severe climate impacts than others, the Commission should apply the social cost of greenhouse gases to any amount of climate pollution that it has quantified, and should weigh those monetized climate damages against other beneficial and adverse effects of the proposal in determining whether the project is in the public convenience and necessary.<sup>69</sup> Such an approach would be consistent with the Commission’s assessment of beneficial economic impacts such as payroll and tax revenues, which FERC regularly quantifies and considers no matter how large or small.<sup>70</sup>

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<sup>67</sup> Civil Penalties, 84 Fed. Reg. 36,007, 36,032 (July 26, 2019).

<sup>68</sup> Final Environmental Impact Statement, CAFE Standards, Passenger Cars and Light Trucks, Model Years 2017–2025 at 5-62 (cited in 84 Fed. Reg. at 36,032) (finding that rule would reduce climate-related damages by central estimate of \$142 billion compared to no-action alternative).

<sup>69</sup> This cost-benefit balancing framework is already broadly consistent with Commission guidance. Specifically, the current Policy Statement describes the Commission’s task as “a flexible balancing process during which it weighs the factors presented in a particular application.” *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227, at 14 (1999). The Commission explains that this process involves “balancing the benefits against the adverse effects” of the project, and that a project should proceed if the Commission determines “that the public benefits outweigh the adverse effects.” *Id.*

<sup>70</sup> The Commission frequently considers the economic impacts of even relatively minor expansion or infrastructure projects. In a recent Environmental Assessment for the East Lateral XPress Project, the Commission quantified projected payroll, expenditures, and tax revenues. Some of these impacts were quite limited: For instance, the

When determining whether to grant a certificate application, comparing monetized climate impacts against any beneficial project impacts is highly valuable. If the benefits of the project are very small, then even a fairly modest climate cost (such as in the tens or hundreds of thousands of dollars annually) could itself provide grounds to deny the application, and the Commission should use its judgment in weighing the beneficial and adverse project impacts (which include not only climate impacts but also construction and operational costs, landowner and community costs, and other environmental harms including impacts on terrain, threatened or endangered species, and local pollution).<sup>71</sup> Proposed projects with larger benefits could still fail the cost-benefit test if climate and other costs are comparatively larger. And even if the Commission determines that a project is in the public interest, assessing climate harms using the social cost of greenhouse gases facilitates a careful balancing and can inform the Commission’s assessment of any greenhouse gas mitigation measures that it decides to impose.<sup>72</sup>

Meaningfully considering climate impacts—regardless of their magnitude—through application of the social cost of greenhouse gas metrics can also help inform the Commission’s mitigation requirements for proposals that it does approve.<sup>73</sup> This is because *all* greenhouse gas emissions mix into the global atmosphere and incrementally contribute to climate change, and thus, insofar as the Commission imposes mitigation requirements on greenhouse gas emissions, it should apply those mitigation requirements to all quantified emissions and not just those above a certain threshold. Whether or not an amount of carbon emissions rises above a certain threshold or exceeds the project’s monetized benefits thus should not dictate whether the Commission requires mitigation of that impact,<sup>74</sup> as in either event, the core rationale for mitigation—to ensure “the preservation and enhancement of the environment”<sup>75</sup>—equally applies.

Accordingly, the Commission should meaningfully consider all greenhouse gas emissions in determining whether, and under what conditions, to approve a certificate application and should apply the social cost of greenhouse gases to any quantified emission estimate. This will enable the Commission to rationally weigh climate effects alongside other project benefits and costs in determining whether the application meets the standards for a certificate of public

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Commission forecasted that the project “would pay annual property taxes of approximately \$537,000 for the Centerville Compressor Station in St. Mary Parish and \$637,000 for the Golden Meadow Compressor Station in Lafourche Parish.” FERC, East Lateral XPress Project Environmental Assessment 55–56 (2021).

<sup>71</sup> See Zevin, *supra* note 50, at 507–14.

<sup>72</sup> Aside from greenhouse gas emissions, pipelines also cause substantial environmental and social harms including air and water pollution, disruption to local landowners and communities, and risk of injury or fatality from incidents. In assessing certification, the Commission should take all of these factors into account, and should not assess monetized climate impacts and project benefits to the exclusion of other impacts. Because this comment letter focuses on greenhouse gases, however, a detailed discussion of how the Commission should account for these various impacts is outside of the comment’s scope.

<sup>73</sup> See *Sierra Club v. FERC*, 867 F.3d 1357, 1374 (D.C. Cir. 2017) (“[G]reenhouse-gas emissions are an indirect effect of authorizing [a natural gas pipeline] project, which FERC ... has legal authority to mitigate.”); *Rio Grande LNG, LLC*, 169 FERC ¶ 61,131, at P 15 (Glick, Comm’r, dissenting) (explaining that “the Commission could blunt [a natural-gas project’s greenhouse gas] impacts through mitigation—as the Commission often does with regard to other environmental impacts”).

<sup>74</sup> See, e.g., Bureau of Land Mgmt., Record of Decision for the Sunrise Powerlink Transmission Project and Associate Amendment to the Eastern San Diego County Resource Management Plan D.11-52 to -53 (2009), <https://perma.cc/E9RP-EAG3> (embracing a “no net increase” standard for carbon emissions).

<sup>75</sup> 42 U.S.C. § 4331(c).

convenience and necessity, and enable the Commission to take all greenhouse gas emissions into account in assessing mitigation measures.

### **B. In Assessing the Significance of Greenhouse Gas Emissions, the Commission Should Ensure Consistency with Its Treatment of Project Benefits**

Meaningful consideration of all greenhouse gas emissions is also beneficial for a related reason: Because the Commission considers a project’s beneficial economic impacts no matter how large or small,<sup>76</sup> and has sometimes concluded that impacts of just a few million dollars annually are significant. To preserve a reasonable balance, the Commission should adopt similar practices when assessing the significance of climate impacts. In particular, we suggest the following practices:

#### ***Significance Determinations Based on Monetized Climate Damages Should be Consistent with the Commission’s Practices for Assessing the Significance of Other Monetized Effects***

In previous determinations, the Commission has declined to apply the social cost of greenhouse gases because it claims that “there are no established criteria identifying the monetized values that are to be considered significant for NEPA reviews.”<sup>77</sup> While all environmental and economic impacts present similar line-drawing challenges, this has not always prevented the Commission from assessing the significance of monetized values when it comes to a proposal’s beneficial economic impacts, nor has it prevented the Commission from assessing the significance of non-monetized environmental impacts.<sup>78</sup> Insofar as the Commission applies significance thresholds for climate impacts, it should do so consistently with the precedent it has set in those prior assessments.

While the Commission’s approach to assessing the significance of economic benefits is itself not entirely consistent, the Commission has at times labeled particular monetized economic benefits as significant. For instance, in its recent Environmental Impact Statement for the Alaska LNG project, the Commission found that regional increases of annual employee earnings of \$8 million and \$28 million “would be significant” for their communities.<sup>79</sup> Likewise, in its Environmental Impact Statement for the Sierrita Pipeline Project, the Commission explained that “the project would benefit the state and local economies by creating a short-term stimulus to the affected areas through payroll expenditures, local purchases of consumables and Project-specific materials, and sales tax,” indicating that these impacts are “significant.”<sup>80</sup> For that project, total construction payroll was projected at \$15 million, while total taxes (both sales and property) were estimated at about \$5 million annually (presumably in 2014\$).<sup>81</sup> These precedents suggest that annual gross climate damages of roughly \$8–\$20 million should be considered significant,

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<sup>76</sup> See, e.g., *supra* note 70 (monetizing economic impacts as low as \$537,000).

<sup>77</sup> *Rio Grande LNG, LLC*, 170 FERC ¶ 61,046, at P 104.

<sup>78</sup> For any impact—climate or otherwise—assessing “significance” is not a purely fact-based judgment that a research tool can accomplish. While research tools such as the social cost of greenhouse gases are critical for assessing the nature and scope of project impacts, determining whether those impacts are “significant” is a legal determination that requires reasoned judgment by the Commission. In this respect, climate impacts are no different than any other type of impact for which the Commission regularly evaluates significance.

<sup>79</sup> Alaska LNG Environmental Impact Statement 4-638 (2020).

<sup>80</sup> Sierra Pipeline Project Environmental Impact Statement 4-201 (2014).

<sup>81</sup> *Id.* at 4-200 to -201.

and FERC should also assess whether lower monetized climate damage figures should also be considered significant as compared to other costs and benefits. In any assessment of the significance of climate damages, FERC should bear in mind that the current estimates of the social cost of greenhouse gases are widely considered to be conservative underestimates that omit many key categories of climate damages.<sup>82</sup> FERC should qualitatively consider any unmonetized climate damages in its determination of significance as well. As noted above, moreover, even lower estimations of climate damages can provide a reason to reject a certificate proposal when the proposal's benefits are comparatively small.

Judicial precedent is consistent with this approach. For instance, the U.S. District Court for the District of Colorado found that it was arbitrary under NEPA for the Forest Service not to monetize the "1.23 million tons of carbon dioxide equivalent emissions" emitted annually from one project<sup>83</sup>—which corresponds to about \$63 million using the Working Group's central social cost estimate.<sup>84</sup> Likewise, the U.S. Court of Appeals for the Ninth Circuit found that it was arbitrary for the Department of Transportation not to monetize the 35 million metric ton difference in lifetime emissions from increasing the fuel efficiency of motor vehicles.<sup>85</sup> Given the estimated lifetime of vehicles sold in the years 2008-2011 (sometimes estimated at about 15 years on average), this figure likely represents about 2 million metric tons per year or roughly \$100 million in annual climate damage using 2020 estimates of the social cost of greenhouse gases. Because these court decisions found that the defendant agency must monetize climate damages, the relevant dollar figures are above any monetization threshold, and not the lower bound of the threshold itself.

Accordingly, when assessing the significance of monetized greenhouse gas impacts, the Commission should necessarily consider climate damage estimates at or higher than the dollar figures from these precedents to be significant. As noted above, even smaller damage estimates could be relevant to assess whether and on what terms to approve a certificate application, particularly where estimated project benefits are relatively minor.

***If the Commission Assesses Significance Based on Percentages of Geographic Targets or Inventories, Its Thresholds Should Be Set at Very Low Percentages to Reflect the Fact that Even Miniscule Percentages Represent Grave Harm***

Percentage comparisons to geographic targets and inventories do not provide the best methodology for assessing climate impacts, as this approach often trivializes substantial emissions by presenting them as small percentages. Accordingly, courts have rejected this approach as inadequate, and we do not endorse the approach as sufficient on its own for

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<sup>82</sup> 2021 TSD, *supra* note 24, at 4 (Working Group acknowledging that its current social cost valuations "likely underestimate societal damages from [greenhouse gas] emissions"). For instance, in a 2019 proceeding adopting cost-effectiveness analysis for distributed energy resources, the California Public Utilities Commission opted to use the Working Group's 95<sup>th</sup>-percentile damage estimates on the basis that the "Working Group's average values underestimate the damage costs associated with climate change." Rulemaking 14-10-003: Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning and Evaluation of Integrated Distributed Energy Resources 39 (May 16, 2019), *available at* <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M293/K833/293833387.PDF>.

<sup>83</sup> *High County*, 52 F. Supp. 3d at 1191.

<sup>84</sup> The Working Group's central estimate for year 2020 emissions is \$51 per metric ton of carbon dioxide. 1.23 million times \$51 equals \$62.73 million.

<sup>85</sup> *Ctr. for Biological Diversity*, 538 F.3d at 1187.

assessing climate impacts.<sup>86</sup> Nonetheless, insofar as the Commission continues to assess significance using percentage comparisons to geographic totals or targets, it should recognize that even very low percentages can represent significant impacts, reflecting the severe and global nature of climate change.

As detailed above, the mere fact that a project emits a small percentage of a statewide, national, or global target or total does not mean that its effects are insubstantial. To the contrary, the severe and global nature of climate change means that even a seemingly negligible percentage of global (or even national or regional) greenhouse gas emissions can be a gargantuan source of harm on its own. For instance, as noted above, a project that an agency dismissed as contributing just 0.44% of global emissions would in fact cause more than \$9 billion in annual climate damage.<sup>87</sup> Thus, while it makes sense to assess climate impacts on a large geographic scale given the global rather than localized nature of greenhouse gas pollution, it would be inappropriate for the Commission to subject climate impacts to the same percentage thresholds as it applies to localized effects. Because the denominator of state, nationwide, or global impacts is larger than when assessing those same impacts on a regional or local scale, those impacts will appear as smaller percentages and the Commission must adjust its significance analysis accordingly.

Indeed, if the Commission were to assess other impacts that it deems significant on a national or global scale rather than a regional or local level, it too would find that those impacts are just a miniscule percentage of these larger totals. For instance, as noted above, the Commission has deemed regional employee payrolls as low as \$8 million annually to be significant.<sup>88</sup> While that dollar figure may have appeared large when assessed at the regional level, it equals approximately 0.0001 percent (i.e. one one-millionth) of the \$8.4 trillion in annual wages throughout the United States<sup>89</sup> or approximately 0.00001 (i.e. one ten-millionth) of the roughly \$70 trillion in annual wages worldwide.<sup>90</sup> To ensure consistency, therefore, if the Commission assesses significance of greenhouse gas emissions using percentage comparisons to geographical targets or inventories, it should draw the line at a similarly very low percentage. But again, we do not endorse assessing significance based on percentage comparisons.

***If the Commission Assesses Significance Based on Physical Impacts, It Should Also Set Thresholds that Are Very Low***

Insofar as the Commission applies significance thresholds using physical climate impacts—which we do not endorse, for the reasons discussed above—the Commission should again apply very low thresholds reflecting the fact that seemingly minor physical changes can have devastating consequences. As noted above, physical impacts can be deceptive, since any single project is unlikely to affect global temperatures or sea levels more than a seemingly trivial

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<sup>86</sup> See, e.g., *id.* at 1216 (explaining that NHTSA provided comparison to nationwide emissions in NEPA assessment that Ninth Circuit deemed arbitrary and capricious); *California*, 472 F. Supp. 3d at 623 (“[F]raming sources as less than 1% of [national or] global emissions is dishonest and a prescription for climate disaster.”).

<sup>87</sup> See *supra* notes 57–60 and accompanying text.

<sup>88</sup> See *supra* note 79 and accompanying text.

<sup>89</sup> Bureau of Labor Statistics, Employment and Wages: Annual Averages 2018, <https://www.bls.gov/cew/publications/employment-and-wages-annual-averages/2018/home.htm#:~:text=In%202018%2C%20BLS%20derived%20totals,by%20UI%20or%20by%20UCF> E.

<sup>90</sup> See Ruth Alexander, *Where are you on the global pay scale?*, BBC News (Mar. 29, 2012).

amount. Yet even seemingly negligible changes can be catastrophic. For instance, an action that NHTSA dismissed as raising global temperatures by no more than 0.016 °C would actually cause up to about \$140 billion in climate harm.<sup>91</sup> Any significance thresholds from the Commission should be set extremely low to reflect this reality.

For instance, temperature or sea-level rise thresholds could be set at the levels that correspond to a few million dollars per year in climate damages.<sup>92</sup> However, it would be easier and more transparent for the Commission to report and assess the significance of a project's climate damages using the social cost of greenhouse gases.

## **V. Legal and Empirical Objections to the Social Cost of Greenhouse Gases Submitted by a Coalition of States Are Meritless**

In our 2018 comments, we offered detailed rebuttals to the various arguments that the Commission had provided opposing the use of the social cost of greenhouse gases.<sup>93</sup> In a comment letter filed to this docket on April 26, 2021, a coalition of twenty-two states, led by Missouri Attorney General Eric Schmitt, provided additional objections to the Commission's use of the social cost of greenhouse gases.<sup>94</sup> For the reasons detailed below, these additional objections also lack merit.

### **A. The Commission Is Certainly Permitted, And In Fact Required, to Evaluate Climate Impacts Under the Natural Gas Act and NEPA**

The multistate coalition begins by alleging that neither the NGA nor NEPA authorize the Commission to apply the social cost of greenhouse gases in the certification process.<sup>95</sup> In essence, the states claim that FERC may not consider climate impacts during certification.<sup>96</sup> This is wrong. In reality, caselaw under both the NGA and NEPA is abundantly clear that these statutes permit, and in fact require, the Commission to account for climate impacts when assessing public convenience and necessity.

#### **Natural Gas Act**

When enacting the Natural Gas Act, Congress determined that the “business of transporting and selling natural gas for ultimate distribution to the public is affected with the public interest.”<sup>97</sup> As a result, the public convenience and necessity standard has been interpreted to encompass “all factors bearing on the public interest.”<sup>98</sup> In *NAACP v. Federal Power Commission*, the Supreme Court established that environmental considerations are a critical part

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<sup>91</sup> See *supra* notes 67–68 and accompanying text.

<sup>92</sup> See *supra* notes 79–81 and accompanying text.

<sup>93</sup> 2018 Comments at 12–32.

<sup>94</sup> Eric S. Schmitt et al., Comment on the Use of the Social Cost of Carbon (Apr. 26, 2021) [hereinafter “Multistate Coalition Comment Letter”].

<sup>95</sup> *Id.* at 2–7.

<sup>96</sup> *Id.* at 3 (“Although the ‘public interest’ is central to FERC’s responsibilities, Congress did not define it—but Congress certainly never stated that it was an invitation to FERC to dictate a global warming policy for the United States.”); *id.* at 6 (“NEPA does not contain any clear statement of Congress delegating authority to FERC to anticipate and mitigate global climate change[.]”).

<sup>97</sup> 15 U.S.C. § 717.

<sup>98</sup> *Atl. Refining Co. v. Pub. Serv. Comm’n of N.Y.*, 360 U.S. 378, 391 (1959).

of the Commission’s evaluation of pipelines under Section 7 of the Natural Gas Act.<sup>99</sup> In that case, the Supreme Court held that the precursor agency to FERC, the Federal Power Commission, was allowed to issue a rule regulating the equal employment practices of utilities only if it determined that discrimination undermined just and reasonable rates in the public interest. The Court determined that the Commission’s obligation to act in the public interest is not a “license to promote the general public welfare,” but rather the Commission must promote the public interest within the context of the purposes of the acts it administers.<sup>100</sup> In a widely cited footnote, the Court explicitly recognized that “the Commission has authority to consider . . . environmental . . . questions” because they are a “subsidiary purpose[.]” of the Natural Gas Act.<sup>101</sup>

Numerous courts have interpreted this discussion and subsequent caselaw to confirm that environmental impacts must be considered when evaluating a certificate application.<sup>102</sup> In the 2017 *Sabal Trail* case, the U.S. Court of Appeals for the District of Columbia Circuit vacated the Commission’s approval of a natural gas pipeline on the ground that FERC had not met its obligations to consider climate impacts under the Natural Gas Act and NEPA when it issued a certificate of public convenience and necessity. The Court explained that because the “public convenience and necessity” standard requires FERC to “balance the public benefits against the adverse effects of the project,” the Commission “could deny a pipeline certificate on the ground that the pipeline would be too harmful to the environment.”<sup>103</sup> The Court specifically held that the Commission has the authority to assess, balance, and mitigate greenhouse gas emissions (including downstream emissions) as part of the public convenience and necessity assessment.<sup>104</sup>

While the multistate coalition cites to recent caselaw deferring to the Commission’s judgment not to use the social cost of greenhouse gases in pipeline certificate proceedings, those cases did not question FERC’s authority to evaluate climate impacts or to use the social cost metrics. To the contrary, these cases implicitly acknowledge that FERC has responsibility to consider climate impacts. In *EarthReports v. FERC*, the D.C. Circuit assumed without question that the Commission should “analyze the environmental impacts of greenhouse gas emissions” from pipeline infrastructure approvals.<sup>105</sup> Although the Court deferred at the time to the Commission’s decision not to apply the social cost of greenhouse gases as the means to evaluate those impacts,<sup>106</sup> it suggested that the Commission would have been justified in applying that

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<sup>99</sup> 425 U.S. 662 (1976).

<sup>100</sup> *Id.* at 669.

<sup>101</sup> *Id.* at 670 & n. 6.

<sup>102</sup> See, e.g., *Pub. Utilities Comm’n of State of Cal. v. FERC*, 900 F.2d 269, 281 (D.C. Cir. 1990); *Minisink Residents for Envtl. Pres. & Safety v. FERC*, 762 F.3d 97, 101 (D.C. Cir. 2014); *Myersville Citizens for a Rural Cmty. v. FERC*, 783 F.3d 1301, 1307 (D.C. Cir. 2015); *Sierra Club v. DOE*, 867 F.3d 189, 202 (D.C. Cir. 2017).

<sup>103</sup> *Sierra Club v. FERC*, 867 F.3d 1357, 1373 (D.C. Cir. 2017).

<sup>104</sup> *Id.* at 1374.

<sup>105</sup> *EarthReports, Inc. v. FERC*, 828 F.3d 949, 956 (D.C. Cir. 2016).

<sup>106</sup> The justifications that the Commission offered in *EarthReports* for declining to apply the social cost of greenhouse gases no longer apply. First, the Commission cited the alleged lack of consensus about the appropriate discount rates, but as discussed herein and in our 2018 comments, there is widespread consensus that discount rates of 3% or lower are most appropriate for intergenerational impacts. Second, the Commission cited the alleged disconnect between the social cost metrics and actual environmental impacts, but has since admitted that “[o]n further review, we accept that the Social Cost of Carbon methodology does constitute a tool that can be used to estimate incremental physical climate change impacts.” *Florida Southeast Connection, LLC et al.*, 162 FERC ¶ 61,233, at P 48 (2018). And third, the Commission cited the alleged lack of criteria for significance, yet as detailed

tool had it concluded that “it would . . . be informative to use.”<sup>107</sup> In light of the substantial evidence supporting the rigor and reliability of the social cost of greenhouse gases, the Commission should now make that finding.

Indeed, even the caselaw that the multistate coalition relies upon supports, if not compels, the Commission’s assessment of climate impacts under the Natural Gas Act. Specifically, the coalition relies heavily on both *NAACP v. Federal Power Commission*, 425 U.S. 662, 669 (1976), and *Public Utilities Commission of State of California v. FERC*, 900 F.2d 269, 281 (D.C. Cir. 1990).<sup>108</sup> But in both cases, the D.C. Circuit expressly recognized that the Commission has the authority to consider “subsidiary purposes,” of the Natural Gas Act including “conservation, environmental, and antitrust” issues.<sup>109</sup> And as detailed above, more recent decisions from the D.C. Circuit confirm that this authority to consider environmental impacts extends to climate change and greenhouse gas emissions.

## **NEPA**

The coalition’s arguments regarding the Commission’s authority under NEPA fare no better. Here too, caselaw from the D.C. Circuit is dispositive, as the Court on numerous occasions has held that the Commission’s assessments under NEPA require reasonable assessment of greenhouse gas impacts. For instance in *Sabal Trail*, the Court concluded that because the Commission has “legal authority to consider” the greenhouse gas emissions resulting from a proposed pipeline, it therefore has a “NEPA obligation stemming from those effects.”<sup>110</sup> The Court reaffirmed that decision in an opinion issued two years later in *Birckhead v. FERC*, finding that because the Commission may “deny a pipeline certificate on the ground that the pipeline would be too harmful to the environment, the agency is a ‘legally relevant cause’ of the direct and indirect environmental effects of pipelines it approves” and thus should “consider[] these effects in its NEPA analysis.”<sup>111</sup>

While the multistate coalition highlights that the Council on Environmental Quality revised NEPA’s implementing regulations last year to not mandate consideration of impacts that are geographically or temporally remote,<sup>112</sup> those regulations have no bearing here. For one, we are not aware of any federal precedent concluding that current NEPA regulations preclude consideration of climate impacts. To the contrary, CEQ explicitly stated when promulgating those regulations that “[t]he rule does not preclude consideration of the impacts of a proposed action on any particular aspect of the human environment,” and “analysis of the impacts on climate change will depend on the specific circumstances of the proposed action.”<sup>113</sup> Federal

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above, FERC can assess the significance of monetized climate damages just as it assesses the significance of other monetized and non-monetized impacts.

<sup>107</sup> *EarthReports*, 828 F.3d at 956 (internal quotation marks omitted).

<sup>108</sup> See Multistate Coalition Comment Letter at 3–4.

<sup>109</sup> *NAACP*, 425 U.S. 670 & n.6; *Pub. Utils. Comm’n*, 900 F.2d at 297 (quoting *NAACP*).

<sup>110</sup> *Sierra Club*, 867 F.3d at 1372.

<sup>111</sup> 925 F.3d 510, 519 (D.C. Cir. 2019) (internal quotation marks and alterations omitted).

<sup>112</sup> See Multistate Coalition Comment Letter at 6 (citing CEQ, Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Fed. Reg. 43,304, 43,375 (July 16, 2020)).

<sup>113</sup> 85 Fed. Reg. at 43,344.

agencies including FERC have routinely assessed greenhouse gas emissions in NEPA analyses even after CEQ finalized its revised regulations.<sup>114</sup>

Additionally, numerous courts have held that NEPA itself (not just its former implementing regulations) “is concerned with indirect effects as well as direct effects.”<sup>115</sup> In one case, for instance, the U.S. Court of Appeals for the Eighth Circuit emphasized long-term effects as a reason the proposed project would significantly affect the environment and require an environmental impact statement, noting that logging could “cause erosion and water pollution that remain visible for as long as 100 years.”<sup>116</sup> In another case, the D.C. Circuit explained that NEPA “plainly contemplates consideration of both the long-and short-range implications to man” and therefore “the fact that ... effects will not begin to be felt for several years, perhaps over a decade, is not controlling.”<sup>117</sup> These cases were decided prior to the passage of CEQ’s 1978 regulations that defined “indirect” impacts, with the courts interpreting NEPA directly.

Likewise, caselaw prior to CEQ’s 1978 implementing regulations emphasizes NEPA’s concern for reasonably foreseeable impacts that are geographically remote. In the D.C. Circuit case discussed in the prior paragraph, the Court required the agency to assess impacts that were not only far in the future but also dispersed across the nation. When considering the severity of the environmental effects of a nuclear reactor, the Court stressed that nationally, the program would produce substantial radioactive waste by the year 2000, even though the locations of waste storage facilities were evidently as of yet unknown. The Court nonetheless found these waste effects to “warrant the most searching scrutiny under NEPA.”<sup>118</sup> And in another case, the U.S. District Court for the District of Columbia interpreted NEPA to require consideration of the geographically remote effects—namely, the spread of foot-and-mouth disease into North America likely to result from approval of a highway connecting Panama and Colombia.<sup>119</sup>

As these cases demonstrate, NEPA itself requires consideration of geographically and temporarily remote impacts, regardless of what current regulations state. Thus, as recent caselaw has concluded, consideration of climate impacts fits within the scope of a NEPA analysis. Consideration of greenhouse gas emissions and climate effects is therefore permitted, and in fact required, under NEPA. Nonetheless, even if the Commission disagrees with this interpretation, it must still consider climate impacts under the Natural Gas Act.<sup>120</sup>

## **B. The Working Group’s Valuations Follow Established Best Practices, Underwent Rigorous Review, and Are Not Too Uncertain to Apply**

The multistate coalition also raises numerous misguided or incorrect technical objections to the Working Group’s social cost of greenhouse gases valuations, claiming that these

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<sup>114</sup> See, e.g., Bureau of Land Mgmt., Willow Master Development Plan Final Environmental Impact Statement 31 (2020). Although BLM declined to apply the social cost of greenhouse gases, it did not cite the CEQ regulations as a basis for that decision. *Id.* App’x E-2.

<sup>115</sup> *Minn. Pub. Int. Research Grp. v. Butz*, 498 F.2d 1314, 1322 (8th Cir. 1974).

<sup>116</sup> *Id.*

<sup>117</sup> *Scientists’ Inst. for Pub. Inf., Inc. v. Atomic Energy Comm.*, 481 F.2d 1079, 1090 (D.C. Cir. 1973).

<sup>118</sup> *Id.* at 1093–94.

<sup>119</sup> *Sierra Club v. Coleman*, 421 F. Supp. 63, 65–66 (D.D.C. 1976).

<sup>120</sup> As the multistate coalition recognizes, FERC regulations provide that the “Commission will comply with the regulations of the Council on Environmental Quality except where those regulations are inconsistent with the statutory requirements of the Commission.” 18 C.F.R. § 380.1 (*cited at* Multistate Coalition Comment Letter at 6).

valuations assess speculative global and long-term damages, apply inappropriately low discount rates, and overstate the social cost values in other ways. These objections lack legal merit, and do not supply bases for the Commission to reject the social cost valuations. In fact, the Working Group developed the social cost of greenhouse gases valuations using a rigorous methodology that followed expert consensus, and its methods have been reviewed and endorsed by independent scientific organizations. While some uncertainty is inherent to any predictive modeling, this is not a reason to abandon the social cost metrics altogether.

### ***The Working Group’s Methodology Is Rigorous, Transparent, and Based on the Best Available Data***

Starting in 2009, the Working Group assembled experts from a dozen federal agencies and White House offices (including the Department of Energy) to “estimate the monetized damages associated with an incremental increase in carbon emissions in a given year” based on “input assumptions that are grounded in the existing scientific and economic literature.”<sup>121</sup> The Working Group’s methods combined three frequently used models built to predict the economic costs of the physical impacts of each additional ton of carbon.<sup>122</sup> The underlying models themselves were themselves the subject of extensive expertise and peer review: One of the models, DICE, was developed by Nobel-prize winner William Nordhaus, a Yale university economics professor.

The Working Group’s social cost of carbon estimates were first issued in 2010 and have been updated several times to reflect the latest and best scientific and economic data.<sup>123</sup> These estimates have been subject to public comment both in the context of dozens of agency proceedings as well as a Working Group comment period in 2013. Following the development of social cost estimates for carbon dioxide, the Working Group applied the same basic methodology in 2016 to develop the social cost of methane and social cost of nitrous oxide.<sup>124</sup> These additional metrics used the same economic models, the same treatment of uncertainty, and the same methodological assumptions that the Working Group applied to the social cost of carbon, and these new estimates underwent rigorous peer-review.<sup>125</sup>

The Working Group’s methodology has been repeatedly endorsed by independent reviewers. In 2014, the U.S. Government Accountability Office concluded that the Working Group had followed a “consensus-based” approach, relied on peer-reviewed academic literature, disclosed relevant limitations, and adequately planned to incorporate new information through

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<sup>121</sup> Working Group, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis* (2010), <https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf> [“2010 TSD”]

<sup>122</sup> *Id.* at 5. These models are DICE (the Dynamic Integrated Model of Climate and the Economy), FUND (the Climate Framework for Uncertainty, Negotiation, and Distribution), and PAGE (Policy Analysis of the Greenhouse Effect).

<sup>123</sup> Working Group, *Technical Update of the Social Cost of Carbon* at 5–29 (2016), available at [https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc\\_tsd\\_final\\_clean\\_8\\_26\\_16.pdf](https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc_tsd_final_clean_8_26_16.pdf).

<sup>124</sup> Working Group, 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 2 (2016), available at [https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/august\\_2016\\_sc\\_ch4\\_sc\\_n2o\\_addendum\\_final\\_8\\_26\\_16.pdf](https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/august_2016_sc_ch4_sc_n2o_addendum_final_8_26_16.pdf).

<sup>125</sup> *Id.* at 3.

public comments and updated research.<sup>126</sup> In 2016 and 2017, the National Academies of Sciences, Engineering, and Medicine issued two reports that, while recommending future improvements, supported the continued use of the Working Group’s estimates.<sup>127</sup> Leading economists and climate policy experts have also endorsed the Working Group’s values as the best available estimates.<sup>128</sup>

### ***The Working Group Reasonably Integrated Both Global and Long-Term Climate Damages***

The multistate coalition claims that the Working Group’s social cost valuations include “entirely speculative predictions” about global impacts and long-term damage estimates to the year 2300.<sup>129</sup> But in fact these damages are crucial to include in the social cost valuations, and the Working Group assessed these damage categories appropriately.

A 300-year time horizon is required by best economic practices. In 2017, the National Academies of Sciences issued a report stressing the importance of a long time horizon for calculating the social cost of greenhouse gases. Specifically, the report stressed that “socioeconomic projections should extend far enough in the future to provide inputs for estimation of the vast majority of discounted climate damages.”<sup>130</sup> The National Academies specifically pointed to studies projecting economic conditions to 2300.<sup>131</sup> And in fact, as the Working Group has previously explained, the three damage models use default time horizons, respectively, until 3000, 2595, and 2200.<sup>132</sup> Because “[m]any consider 2200 too short a time horizon because it could miss a significant fraction of damages,” the Working Group ran each model to 2300 to derive its social cost valuations.<sup>133</sup> Even with these extended time horizons, the Working Group’s damage valuations are still widely regarded as underestimates.

Similarly, the Working Group derived global damage values using the best available data and consistent with expert consensus. As the National Academies found, estimations of the social cost of greenhouse gases should “include representation of important interactions and spillovers among regions and sectors,” lest they omit critical climate impacts.<sup>134</sup> For instance, the National Academies explained, “given global markets, migration, and other factors, effects of a crop failure in India will also have impacts in other countries, and reductions in water availability

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<sup>126</sup> Gov’t Accountability Office, *Regulatory Impact Analysis: Development of Social Cost of Carbon Estimates* 12–19 (2014). Available at <http://www.gao.gov/assets/670/665016.pdf>.

<sup>127</sup> Nat’l Acad. Sci., Engineering & Med., *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide* 3 (2017), <https://www.nap.edu/read/24651/chapter/1>; Nat’l Acad. Sci., Engineering & Med., *Assessment of Approaches to Updating the Social Cost of Carbon: Phase I Report on a Near-Term Update* 1–2 (2016); <https://www.nap.edu/read/21898/chapter/1>.

<sup>128</sup> See, e.g., Richard Revesz et al., *Best Cost Estimate of Greenhouse Gases*, 357 *Science* 655 (2017); Michael Greenstone et al., *Developing a Social Cost of Carbon for U.S. Regulatory Analysis: A Methodology and Interpretation*, 7 *REV. ENVTL. ECON. & POL’Y* 23, 42 (2013); Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 *NATURE* 173 (2014) (explaining that the Working Group’s values, though methodically rigorous and highly useful, are very likely underestimates) (note that co-author Kenneth Arrow is a Nobel Prize-winning economist).

<sup>129</sup> Multistate Coalition Comment Letter at 8–10.

<sup>130</sup> NAS 2017 Report, *supra* note 6, at 10.

<sup>131</sup> *Id.* at 69.

<sup>132</sup> 2010 TSD, *supra* note 121, at 25.

<sup>133</sup> *Id.*

<sup>134</sup> NAS 2017 Report, *supra* note 6, at 17.

in one region will have impacts across many regions and sectors.”<sup>135</sup> The U.S. Court of Appeals for the Seventh Circuit has echoed this conclusion, recognizing that because greenhouse gas emissions cause “global effects, . . . those global effects are an appropriate consideration when looking at a national policy.”<sup>136</sup> Similarly, the U.S. District Court for the Northern District of California recently held that a global focus is critical to capture all climate impacts.”<sup>137</sup>

Nor does assessing global impacts involve a degree of speculation or uncertainty that the Working Group cannot reasonably model. As the Working Group explained, the damage models on which its estimates were derived all estimated global impacts.<sup>138</sup> The Working Group further recognized that because climate change is “a global externality . . . the [social cost of greenhouse gases] must incorporate the full (global) damages caused by [greenhouse gas] emissions.”<sup>139</sup>

### ***The Working Group Applied a Reasonable Range of Discount Rates that Properly Reflects the Long Time Horizon of Climate Effects***

The multistate coalition next criticizes the Working Group’s selection of discount rates, focusing in particular on its omission of a 7 percent discount rate normally recommended for regulatory impact analysis by the Office of Management and Budget (“OMB”).<sup>140</sup> This critique is also misguided and supplies no basis to disregard the social cost of greenhouse gases.

While OMB recommends that agencies apply discount rates of 3 and 7 percent as a default matter,<sup>141</sup> it also recognizes that actions involving long time horizons that affect multiple generations raise special considerations that call for lower discount rates. In particular, OMB explains that “[s]pecial ethical considerations arise when comparing benefits and costs across generations,” since whereas “most people demonstrate time preference in their own consumption behavior, it may not be appropriate for society to demonstrate a similar preference when deciding between the well-being of current and future generations.”<sup>142</sup> Additionally, OMB recognizes that “increased uncertainty about the appropriate value of the discount rate” over long time horizons supplies a “second reason for discounting the benefits and costs accruing to future generations at a lower rate.”<sup>143</sup>

This OMB guidance reflects the widespread consensus that a central estimate calculated at a 3% or lower discount rate, or else using a declining discount rate, is most appropriate, while a 7% discount rate would be wholly inappropriate in the context of intergenerational climate damages. For instance, the National Academies of Sciences has recognized that the unique challenges presented by long time horizons “leads to the use of generally lower discount rates” that those typically applied to short-term costs and benefits.<sup>144</sup> The National Academies stressed

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<sup>135</sup> *Id.* at 150.

<sup>136</sup> *Zero Zone*, 832 F.3d at 679.

<sup>137</sup> *California*, 472 F. Supp. 3d at 613 (“[F]ocusing solely on domestic effects has been soundly rejected by economists as improper and unsupported by science.”).

<sup>138</sup> 2010 TSD, *supra* note 121, at 5 (“These models are useful because they combine climate processes, economic growth, and feedbacks between the climate and the global economy into a single modeling framework.”).

<sup>139</sup> *Id.* at 10.

<sup>140</sup> Multistate Coalition Comment Letter at 10–11.

<sup>141</sup> OMB, Circular A-4 for Regulatory Impact Analysis 33 (2003).

<sup>142</sup> *Id.* at 35.

<sup>143</sup> *Id.* at 36.

<sup>144</sup> NAS 2017 Report, *supra* note 6, at 170.

that the social cost of greenhouse gases applies “discount rates consistent, over the next several decades, with consumption rates of interest”—values that are well below 7%.<sup>145</sup> And in its February 2021 technical support document, moreover, the Working Group provided substantial economic evidence that long-term discount rates are 3% or lower, concluding that even the 3% rate is likely an overestimate of long-term discount rates and thus undervalues the social cost of greenhouse gases.<sup>146</sup>

For a fuller explanation of why the Working Group applied a proper range of discount rates consistent with OMB guidance, see pages 12–19 of our 2018 comments.

### ***The Working Group Did Not Otherwise Overvalue the Social Cost of Greenhouse Gases***

Finally, the multistate coalition claims that the Working Group’s estimates vastly overstate the true social cost of greenhouse gases in various ways. Here too, however, their arguments miss the mark.

For one, the states argue that the Working Group’s Equilibrium Climate Sensitivity (“ECS”) distribution—that is, the amount of warming that is expected to result from a doubling of the atmospheric carbon dioxide concentration—is “out of date” and fails to account for recent evidence showing that sensitivity is lower than previously believed.<sup>147</sup> As support, the states cite a single paper—Lewis & Curry (2015)—which estimates a median ECS of 1.64 °C with an uncertainty range (5–95%) of 1.05–4.05 °C.<sup>148</sup> But that paper is an outlier. The most recent consensus estimate from the Intergovernmental Panel on Climate Change (“IPCC”) projects an ECS uncertainty range of 1.5–4.5 °C.<sup>149</sup> This is far higher than the range from Lewis & Curry (2015). In fact, the median value of 1.64 °C from Lewis & Curry (2015) falls at the very bottom of the consensus IPCC range. In essence, the states elevate the findings of a single outlier paper over consensus estimates from the broader scientific community. In evaluating the ECS, the Working Group assessed estimates from a wide range of experts and selected median values—not extreme estimates for which the states advocate.<sup>150</sup> In fact, the Working Group acknowledged that some ECS estimate ranges go as high as 10 °C, making its selected ECS distribution substantially lower than these high-end estimates.<sup>151</sup>

The states are additionally incorrect to suggest that this one outlier estimate from Lewis & Curry (2015) reflects a growing trend toward lower ECS values. “Through the decades, the range of ECS values has stayed remarkably consistent—somewhere around 1.5 to 4.5 degrees Celsius.”<sup>152</sup> For this reason, the National Academies of Sciences in 2016, after the publication of Lewis & Curry (2015), “recommend[ed] against a near-term change in the distributional form of the ECS” when confronted with the very question of whether to endorse an immediate update, explaining that revisions on this front incorporating the latest science “should have a minimal

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<sup>145</sup> *Id.* at 19.

<sup>146</sup> 2021 TSD, *supra* note 24, at 16–22.

<sup>147</sup> Multistate Coalition Comment Letter at 11.

<sup>148</sup> *Id.* (citing Nicholas Lewis & Judith A. Curry, *The Implications for Climate Sensitivity of AR5 Forcing and Heat Uptake Estimates*, 45 *Climate Dynamics* 1009 (2015)).

<sup>149</sup> IPCC, AR5 Synthesis Report 62 (2014). The IPCC did not provide a central or median estimate in this report.

<sup>150</sup> 2010 TSD, *supra* note 121, at 12–15.

<sup>151</sup> *Id.* at 13.

<sup>152</sup> ScienceDaily, *Increased Warming in Latest Generation of Climate Models Likely Caused by Clouds* (June 24, 2020), <https://www.sciencedaily.com/releases/2020/06/200624151600.htm>

impact on estimates of the [social cost of greenhouse gases].”<sup>153</sup> On the whole, in fact, recent evidence that is informing the IPCC’s next synthesis report tends to indicate that the ECS is higher than previously estimated, not lower.<sup>154</sup> And since its publication, Lewis & Curry (2015) has been criticized by other climate scientists for methodological deficiencies that cause it to underestimate the ECS.<sup>155</sup>

The multistate coalition also claims that the social cost of greenhouse gases “fails to fairly account for agricultural benefits caused by increased carbon dioxide concentrations” and thus critically overstates the true social cost valuations.<sup>156</sup> This too is incorrect. In fact, several of the assessment models that the Working Group relies on to develop its social cost estimates do account for agricultural benefits. And evidence suggests that, if anything, these models overvalue agricultural benefits, not the opposite.<sup>157</sup> One paper, for instance, concludes that the applied estimates of agricultural impacts produced an undervaluation of the social cost of carbon by more than 50%, explaining that “new damage functions reveal far more adverse agricultural impacts than currently represented” in the assessment models used by the Working Group.<sup>158</sup>

In addition to being factually suspect, the states’ legal premise here is also incorrect, as the mere omission of some effects does not counsel for abandoning the social cost valuations. The Working Group has acknowledged that its social cost of greenhouse gases valuations do not capture all impacts of climate change (either positive or negative), and independent experts broadly agree that the social cost of greenhouse gases likely undervalue true climate damages because they omit far more negative effects than positive ones.<sup>159</sup> For instance, the Working

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<sup>153</sup> NAS 2016 Report, *supra* note 6, at 34, 46.

<sup>154</sup> ScienceDaily, *supra* note 152. It should also be noted that several feedback effects are current excluded in the calculation of the ECS. For example, the versions of the assessment models used by the Working Group do not directly model methane emissions from the melting of the permafrost, despite its exclusion from current ECS calculations. Dmitry Yumashev et al., *Climate Policy Implications of Nonlinear Decline of Arctic Land Permafrost and Other Cryosphere Elements*, 10 NATURE COMMUNS. 1900 (2019). Also, several of the assessment models used by the Working Group do not model ocean update. Masakazu Yoshimori et al., *A Review of Progress Towards Understanding the Transient Global Mean Surface Temperature Response to Radiative Perturbation*, 3 PROGRESS IN EARTH AND PLANETARY SCI. 1 (2016). This further points to current ECS estimates underestimating the amount of warming, not overestimating it.

<sup>155</sup> See, e.g., Kate Marvel et al., *Internal Variability and Disequilibrium Confound Estimates of Climate Sensitivity from Observations*, 45 GEOPHYS. RES. LTRS. 1595 (2018) (“[A] range of recent work ... suggests that such estimates [including Lewis & Curry (2015)] may underestimate equilibrium warming.”); Yoshimori et al., *supra* note 154 (citing Lewis & Curry (2015) for the critique that “[b]ecause the observed data represent the transient stage of the response under increasing green-house gas forcing, this deviation is a concern for the observation-based estimate of the ECS”); Timothy Andrews et al., *Accounting for Temperature Patterns Increases Historical Estimates of Climate Sensitivity*, 45 GEOPHYS. RES. LTRS. 8490 (2018) (explaining that Lewis and Curry disregard “the impact from non-CO<sub>2</sub> forcings and unforced climate variability that could have had a significant impact on the pattern of historical temperature change”).

<sup>156</sup> Multistate Coalition Comment Letter at 12.

<sup>157</sup> See, e.g., Frances C. Moore et al., *Economic Impacts of Climate Change on Agriculture: A Comparison of Process-Based and Statistical Yield Models*, 12 ENVTL. RES. LTRS., 65008 (“[W]e find little evidence for differences in the yield response to warming. The magnitude of CO<sub>2</sub> fertilization is instead a much larger source of uncertainty. Based on this set of impact results, we find a very limited potential for on-farm adaptation to reduce yield impacts.”).

<sup>158</sup> Frances C. Moore et al., *New Science of Climate Change Impacts on Agriculture Implies Higher Social Cost of Carbon*, 8 Nature Communs. 1607 (2017).

<sup>159</sup> Peter Howard, *Omitted Damages: What’s Missing from the Social Cost of Carbon* (2014), [https://policyintegrity.org/files/publications/Omitted\\_Damages\\_Whats\\_Missing\\_From\\_the\\_Social\\_Cost\\_of\\_Carbon](https://policyintegrity.org/files/publications/Omitted_Damages_Whats_Missing_From_the_Social_Cost_of_Carbon).

Group has explained that several of the underlying economic models omit certain major damage categories such as catastrophic damages and certain cross-regional spillover effects.<sup>160</sup> And while the National Academies recommended some updates to the Working Group’s damage functions, it did not suggest that these functions systematically overvalue the social cost values or supply a reason to abandon the metric. To the contrary, as the Ninth Circuit has explained, the mere presence of omitted damages does not provide a legal basis to ignore established methodologies to monetize climate damages, since while “there is a range of [plausible] values, the value of carbon emissions reduction is certainly not zero.”<sup>161</sup>

Finally, with emissions pathways, the multistate coalition similarly makes a mountain out of a molehill. Here, the states argue that the Working Group’s estimates are a vast overestimate because they apply “hopelessly outdated” emissions scenarios that do not account for recent mitigation policies.<sup>162</sup> While the Working Group’s estimates rely on a combination of less and more optimistic emission scenarios, these two scenarios do not yield especially divergent social cost valuations. In comparison to the Working Group’s central social cost of carbon estimate in 2020 of \$51 per ton, the average social cost of carbon on the less optimistic emissions scenario is \$53 per ton compared to \$41 per ton on the more optimistic emissions scenario.<sup>163</sup> While relying more heavily on a more optimistic emission scenario would therefore modestly decrease the social cost of greenhouse gases in a vacuum, the states do not provide evidence that this scenario is more likely and, in any event, more holistic updates to the metrics as recommended by the National Academies of Sciences would likely increase the social cost valuations overall due to the omitted damages discussed above and recent evidence regarding long-term discount rates.<sup>164</sup>

## **CONCLUSION**

For the foregoing reasons, along with the reasons outlined in our 2018 comments, the social cost of greenhouse gases provides the best method to assess the severity of climate impacts from a project proposal, including an application for a certificate of public convenience and necessity. The Commission should therefore apply the social cost of greenhouse gases to evaluate whether, and on what terms and conditions, to approve a certificate application.

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[pdf](#) (“The inclusion of all omitted damages, including these more significant omitted damages, is likely to result in an increase in the [social cost of carbon].”).

<sup>160</sup> 2010 TSD, *supra* note 121, at 26, 32.

<sup>161</sup> *Ctr. for Biological Diversity*, 38 F.3d at 1200.

<sup>162</sup> Multistate Coalition Comment Letter at 11.

<sup>163</sup> See Peter Howard et al., *Option Value and the Social Cost of Carbon: What Are We Waiting For?*, Inst. for Pol’y Integrity Working Paper No. 2020/1, at 16 tbl.1 (2020),

[https://policyintegrity.org/files/publications/Working\\_paper\\_06.22.20.pdf](https://policyintegrity.org/files/publications/Working_paper_06.22.20.pdf).

<sup>164</sup> 2021 TSD, *supra* note 24, at 4 (Working Group acknowledging that its current social cost valuations “likely underestimate societal damages from [greenhouse gas] emissions”).

Sincerely,

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