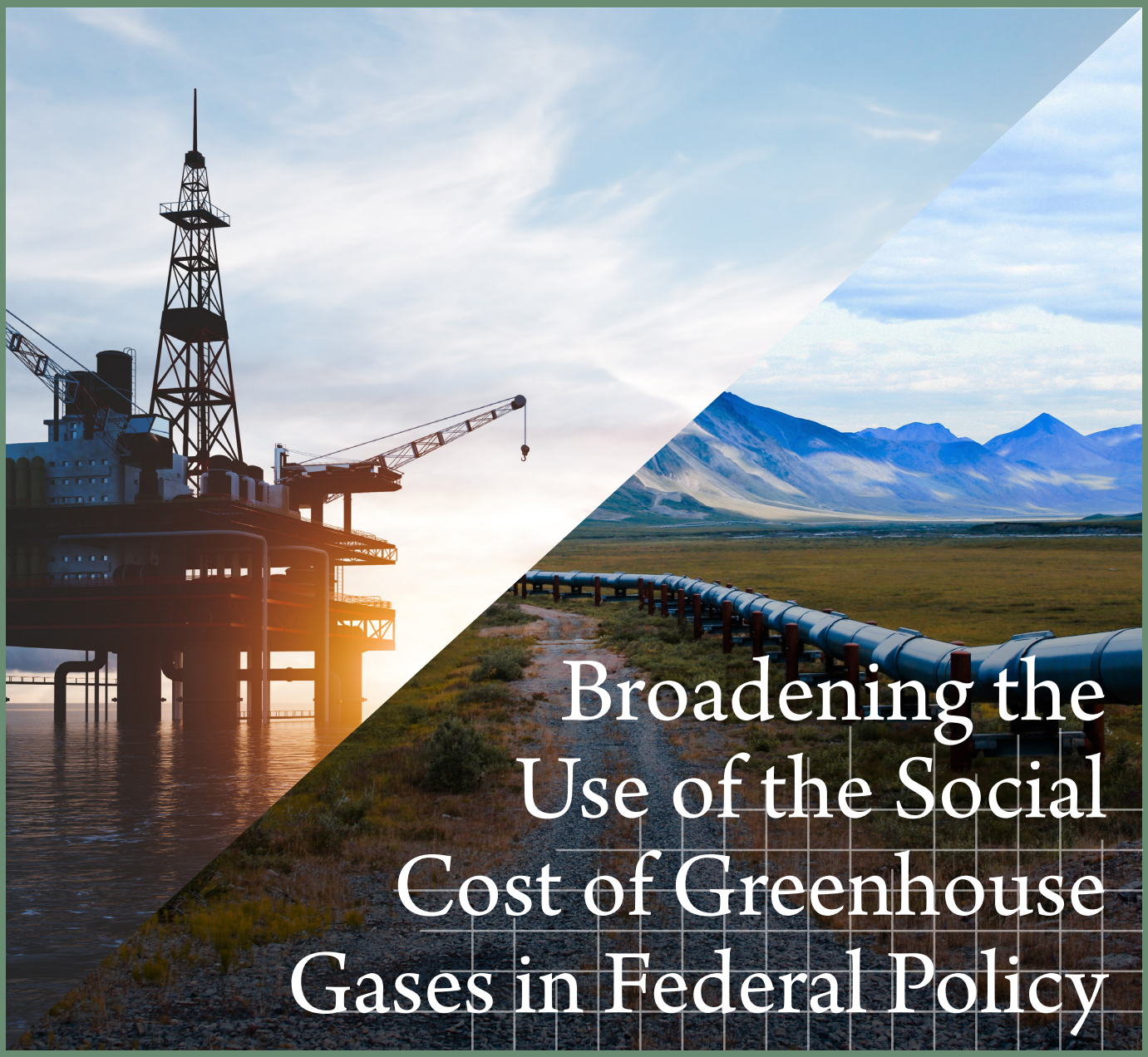

Broadening the Use of the Social Cost of Greenhouse Gases in Federal Policy

Working Paper

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Executive Summary

The damage estimates developed by the Interagency Working Group on the Social Cost of Greenhouse Gases ("Working Group") have been widely recognized for using the best available science and economics to estimate the cost that society bears from the emission of a unit of the greenhouse gases. Known collectively as the "social cost of greenhouse gases," these damage valuations are regularly used in agency cost-benefit analysis to monetize the climate cost or benefit of proposed regulations. While federal agencies[1] and U.S. states[2] have on occasion applied the social cost of greenhouse gases valuations to other areas, agency use of these valuations outside of regulatory cost-benefit analysis has been somewhat sporadic and limited.

It is time for this to change. Because the social cost of greenhouse gases provides the best metric to assess the climate damages from a specific amount of emissions (or the climate benefits from emissions reductions), it can and should be integrated into all areas of policymaking affecting climate change. Indeed, since the social cost of greenhouse gases measures the marginal cost of any additional unit of greenhouse gases emitted into the atmosphere, the tool is highly useful well beyond cost-benefit analysis. Broad application of the social cost of greenhouse gases throughout federal policymaking and processes will enable agencies and departments to identify programs or policies that cost-effectively reduce greenhouse gas emissions. This will promote rationality in federal climate policy and enable a speedy and well-managed transition to a greener economy.

On his first day in office, President Biden signed an Executive Order that, among other important climate priorities, called on the Working Group to provide guidance by September 2021 on how the executive branch could make the best use of the social cost estimates in "decision-making, budgeting, and procurement."[3] This report offers recommendations to the Working Group on providing that guidance.

The social cost of greenhouse gases should be applied to any process or decision with meaningful greenhouse gas implications. Use of the social cost of greenhouse gases is particularly warranted in two broad categories of agency actions in addition to rulemaking. First, use of the social cost of greenhouse gases allows agencies to capture climate effects and seamlessly compare them against other monetized economic effects. This is highly useful in assessments and determinations that involve balancing of

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[1] Peter Howard & Jason A. Schwartz, *Think Global: International Reciprocity as Justification for a Global Social Cost of Carbon*, 42 COLUM. J. ENV'T L. 203, 270–84 (2017) (listing all uses through mid-2016, including eight assessments conducted under NEPA); *see also* Interagency Working Group on Social Cost of Greenhouse Gases, Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 at 12 nn.12–13 (2021) (listing additional uses).

[2] Inst. for Pol'y Integrity, *States Using the SCC*, THE COST OF CARBON, https://costofcarbon.org/states (last visited June 14, 2021) (listing eleven states that apply the social cost of greenhouse gases for processes such as public utility commission assessments and integrated resource plans).

[3] Exec. Order No. 13,990 § 5(b), 86 Fed. Reg. 7037, 7040 (Jan. 20, 2021).

beneficial and adverse impacts, such as in National Environmental Policy Act ("NEPA") assessments, determinations under land-use or energy-management statutes, grant-making decisions, and other contexts. Second, when an agency seeks to internalize the costs of climate change, such as through administrative penalties or mineral royalties, the social cost of greenhouse gases provides a monetized estimate of damages that can be directly incorporated into the applicable monetary rate. This will enable an efficient reduction in greenhouse gas emissions.

This report highlights numerous areas in which the federal government should apply the social cost of greenhouse gases beyond regulatory cost-benefit analysis. It is organized under the tripartite framework of "decision-making, budgeting, and procurement" laid out in the President's executive order. Areas of decisionmaking that could benefit from use of the social cost of greenhouse gases include environmental reviews conducted under NEPA; determinations concerning fossil-fuel extraction, transportation and transmission, and importation and exportation; assessments of electricity rates; and long-term agency planning including performance plans, strategic plans, and performance reports. Areas of budgeting that could benefit from use of the social cost of greenhouse gases include evaluating administrative penalties for regulatory noncompliance, royalty rates for federal land-management, and applications for discretionary grants. For procurement decisions, applicable regulations offer numerous avenues for agencies to consider monetized climate damages.

Several areas of federal policymaking are outside the scope of this report. For one, because the social cost of greenhouse gases is already widely applied in cost-benefit analysis for regulations, this report takes that usage as given and does not discuss it further. Second, this report focuses on avenues for administrative agencies and departments to apply the social cost of greenhouse gases under existing law. While there are many potential areas for Congress to apply the social cost of greenhouse gases in passing new laws—such as by imposing taxes or fees on greenhouse gas emissions—those options are outside the scope of this report. Additionally, this report focuses on federal policy and does not discuss areas of state or local policymaking that could apply the social cost of greenhouse gases. An Institute for Policy Integrity report titled "Opportunities for Valuing Climate Impacts in U.S. State Electricity Policy," published in 2019, highlights many areas for states to apply the social cost of greenhouse gases.[4]

In short, application of the social cost of greenhouse gases would be extremely beneficial for any executive branch decision with significant greenhouse gas implications. The Working Group should endorse the usage of its social cost valuations throughout the federal government.

[4] Denise A. Grab et al., Inst. for Pol'y Integrity, *Opportunities for Valuing Climate Impacts in U.S. State Electricity Policy* (2019).

I. Decisionmaking

The federal government should fully integrate the social cost of greenhouse gases into all areas of decisionmaking with significant greenhouse gas implications. This includes environmental assessments under NEPA; project-level determinations for energy extraction, fossil-fuel transportation, fossil-fuel import and export, and wholesale electricity rates; and long-term planning and review at both the agency and interagency levels. This section summarizes the key federal statutes and processes and discusses how the use of the social cost of greenhouse gases would facilitate sound decisionmaking.

A. Environmental Reviews Under NEPA

Federal agencies can, should, and—according to a growing list of federal court cases—must use the social cost of greenhouse gases under NEPA, as the social cost valuations provide the best method for agencies to assess the climate change impacts of federal actions. While agencies have occasionally applied the social cost valuations under NEPA in the past,[5] the federal government should adopt a policy calling for their consistent usage in any environmental review with significant greenhouse gas impacts. The Working Group should coordinate with the Council on Environmental Quality (which is a Working Group member) to adopt such a policy that will apply to both executive agencies and independent agencies.[6]

Under NEPA, all federal agencies must provide environmental assessments for major actions identifying "the environmental impact of the proposed action"[7] including "any adverse environmental effects which cannot be avoided should the proposal be implemented,"[8] to help ensure that "environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations."[9] As part of the "hard look" that agencies must take at environmental impacts,[10] NEPA and its implementing regulations require agencies to identify and assess alternatives to the proposed action[11] and consider avenues to mitigate environmental harms.[12] Agencies are expected to "make use of

[5] Howard & Schwartz, *supra* note 1, at 270–84.

[6] *See* 42 U.S.C. § 4332(B) ("[A]ll agencies of the Federal Government shall . . . identify and develop methods and procedures, in consultation with the Council on Environmental Quality . . . which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations.").

[7] 42 U.S.C. § 4332(C)(i).

[8] *Id.* § 4332(C)(ii).

[9] *Id.* § 4332(B).

[10] *Balt. Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 97 (1983) (internal quotation marks omitted).

[11] 42 U.S.C. § 4332(C)(iii); 40 C.F.R. § 1502.14 (outlining agency's obligations to consider and evaluate alternatives to the proposed action, including the "no action alternative").

[12] 40 C.F.R. §§ 1502.14(e), 1502.16(a)(6), (7), (9).

reliable existing data and resources" to assess environmental impacts,[13] with a preference for "approaches or research methods generally accepted in the scientific community."[14]

There is little dispute that greenhouse gases are a relevant and necessary consideration under NEPA. Agencies routinely present quantitative estimates of the tons of greenhouse gases emitted or reduced under federal proposals in NEPA assessments, which they frequently supplement with generic qualitative descriptions of the present and future impacts of climate change. Yet while those volumetric estimates of the tons of emissions are a necessary first step, using the social cost of greenhouse gases to contextualize the actual climate change impacts from a proposal's greenhouse gas emissions or reductions would fulfill NEPA's goals and requirements in several key respects.

For one, the social cost valuations best fulfill NEPA's aim of assessing "actual environmental effects."[15] Whereas volumetric emissions totals, standing alone, convey no information about the actual geophysical, public-health, and economic impacts from an incremental unit of greenhouse gas emissions, the social cost of greenhouse gases captures those effects by incorporating them into a single monetized value. Under NEPA, agencies are expected to assess "ecological . . . economic . . ., social, [and] health effects" of environmental impacts.[16] As the U.S. Court of Appeals for the D.C. Circuit has explained, "NEPA requires the health, socioeconomic and cumulative impacts of a proposed action to be disclosed," as such effects inform "decisionmakers of the environmental impact of the action" and their consideration enables "the environmental cost-effectiveness of a proposed action [to] be compared to that of alternative actions."[17] The social cost of greenhouse gases encapsulates these impacts, as it assesses the incremental climate effects of greenhouse gas emissions including property lost or damaged by sea-level rise, coastal storms, flooding, and other extreme weather events, and human health impacts including mortality from heat-related illnesses and changing disease vectors like malaria and dengue fever.[18] Volumetric emission projections, standing alone, do not assess any of those effects.[19]

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[13] *Id.* § 1502.23.

[14] *Id.* § 1502.21(c)(4).

[15] *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 96 (1983) (explaining that NEPA requires consideration of "actual environmental effects").

[16] *Id.* § 1508.1(g)(1) (defining "effects" for purposes of NEPA analysis).

[17] *NRDC v. U. S. Nuclear Regul. Comm'n*, 685 F.2d 459, 487 (D.C. Cir. 1982), *rev'd on other grounds sub nom. Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87 (1983)

[18] Interagency Working Group on Social Cost of Greenhouse Gases, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis 6 (2010).

[19] *Id.* ("[I]t is not releases of [pollution] that Congress wanted disclosed [under NEPA]; it is the effects, or environmental significance, of those releases."); *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 995 (9th Cir. 2004) (concluding that quantifying the acres of timber to be harvested or the miles of road to be constructed does not constitute a "description of *actual* environmental effects," even when paired with a qualitative "list of environmental concerns such as air quality, water quality, and endangered species," if the agency fails to assess "the degree that each factor will be impacted").

> Numerous courts have rejected NEPA analyses that merely quantified emissions without applying the social cost of greenhouse gases, explaining that emission projections alone—even when coupled with percentage comparisons or generic discussions of climate change—fail to capture the climate change effects of the proposed project.

For this reason, numerous federal courts have rejected NEPA analyses that report only volumetric emissions projections or that stop at comparing those emissions to larger volumes such as total global or domestic emissions. In rejecting such an assessment as inadequate, the U.S. Court of Appeals for the Ninth Circuit explained that the "*impact* of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires," and thus agencies must "provide the necessary contextual information about the[se] cumulative and incremental environmental impacts" in their environmental reviews.[20] Numerous other courts have also rejected NEPA analyses that merely quantified emissions without applying the social cost of greenhouse gases, explaining that emission projections alone—even when coupled with percentage comparisons or generic discussions about climate change effects—fail to capture the climate change effects of the proposed project.[21] Though not every reviewing court has come to this conclusion,[22] no court has prohibited the social cost of greenhouse gases under NEPA either. Applying the social cost of greenhouse thus not only provides the best method to assess the climate impacts of a policy proposal, but also reduces an agency's legal risk.

Application of the social cost of greenhouse gases is also useful under NEPA because it allows agencies to seamlessly compare adverse climate impacts to other monetized effects such as the revenue and payroll impacts that agencies typically monetize in their environmental reviews. While NEPA does not require a full and formal cost-benefit analysis,[23] the statute requires agencies to balance environmental values with

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[20] *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (emphasis added).

[21] *See, e.g., 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."); *California v. Bernhardt*, 472 F. Supp. 3d 573, 623 (N.D. Cal. 2020) (citing Kevin M. Stack & Michael P. Vandenbergh, *The One Percent Problem*, 111 COLUM. L. REV. 1385, 1393 (2011) ("[F]raming sources as less than 1% of global emissions is dishonest and a prescription for climate disaster. . . . Mere quantification is insufficient."); *Mont. Env't 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").

[22] Cases that have rejected the need to apply the social cost of greenhouse gases in NEPA analyses include *EarthReports, Inc. v. FERC*, 828 F.3d 949, 956 (D.C. Cir. 2016); *Citizens for a Healthy Cmty. v. BLM*, 377 F. Supp. 3d 1223, 1239–41 (D. Colo. 2019); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 77–79 (D.D.C. 2019).

[23] 40 C.F.R. § 1502.22.

other economic and social considerations.[24] Federal courts have consistently held that NEPA "mandates a rather finely tuned and systematic balancing analysis" of "environmental costs" against "economic and technical benefits."[25] And regulations broadly sanction the use of cost-benefit analysis under NEPA and indicate that monetized values can be useful.[26]

Because agencies frequently provide monetized estimates of the economic benefits from fossil-fuel projects in their environmental impact statements, failing to monetize climate costs jeopardizes the balancing that NEPA requires and could lead to a lopsided analysis. For this reason, federal courts have held on numerous occasions that an agency violated NEPA by monetizing project benefits without monetizing climate costs.[27] In a decision issued earlier this year, a federal court held that "when an agency chooses to quantify the socioeconomic benefits of a proposed action [under NEPA], it would be arbitrary and capricious for the agency to undervalue the socioeconomic costs of that plan by failing to include a balanced quantification of those costs."[28] The court further explained "that federal agencies inappropriately put their thumb on the scale when they quantify the benefits of a proposed plan but fail to quantify the costs."[29] More broadly, courts disapprove of lopsided analyses that do not look consistently at both beneficial and adverse impacts.[30]

Application of the various social cost of greenhouse gas metrics (for carbon dioxide, methane, and nitrous oxide) is also the best way to compare or aggregate the value of reducing various greenhouse gas pollutants than conversion to carbon dioxide-equivalent units through pollutants' relative global warming potentials. The Working Group has explained that "because non-[carbon dioxide] [greenhouse gases] differ not just in their potential to absorb infrared radiation over a given time frame, but also in the temporal pathway of

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[24] *See* 42 U.S.C. §§ 4331(a), 4332(B).

[25] *Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n*, 449 F.2d 1109, 1113 (D.C. Cir. 1971); *see also, e.g., Chelsea Neighborhood Ass'ns 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).

[26] 40 C.F.R. § 1502.22.

[27] *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1190, 1191 (D. Colo. 2014) (finding that it was "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"); . *Mont. Env't Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1094–99 (D. Mont. 2017) (same). In both cases, the courts reached these conclusions notwithstanding the agencies' justifications for rejecting the social cost of greenhouse gases. *High Country*, 52 F. Supp. 3d at 1192 & n.4; *Mont. Env't Info. Ctr.*, 274 F. Supp. 3d at 1094–96 (dismissing arguments that social cost values can be applied only in rulemakings). *See also* Jayni Hein & Natalie Jacewicz, *Implementing NEPA in the Age of Climate Change,* 10 MICH. J. ENV'T & ADMIN. L 1, 41–42 (2021) (explaining that "inconsistent treatment of expected revenue and expected emissions places a thumb on the scale in favor of [fossil-fuel] development").

[28] *WildEarth Guardians v. Bernhardt*, No. CV 17-80-BLG-SPW, 2021 WL 363955, at *9 (D. Mont. Feb. 3, 2021).

[29] *Id.*

[30] *See, e.g., Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1198 (9th Cir. 2008) (finding it arbitrary to arbitrary to "put a thumb on the scale by undervaluing the benefits and overvaluing the costs" of a regulation); *Bus. Roundtable v. Secs. & Exch. Comm'n*, 647 F.3d 1144, 1148-49 (D.C. Cir. 2011) (criticizing agency for "inconsistently and opportunistically fram[ing] the costs and benefits" of a rule).

their impact on radiative forcing . . . [and] [p]hysical impacts other than temperature change . . . transforming gases into [carbon dioxide]-equivalents using [global warming potential] . . . is not as accurate as a direct calculation of the social costs" of methane and nitrous oxide.[31] Therefore, if an agency is choosing between actions that may reduce more methane but less carbon dioxide, versus actions that might reduce more carbon dioxide but less methane, application of the social cost of greenhouse gas metrics may better facilitate prioritization.

In a 2016 guidance document instructing agencies on accounting for climate change consistently in the NEPA process, the Council on Environmental Quality highlighted the social cost of greenhouse gases as "a harmonized, interagency metric that can give decision makers and the public useful information."[32] In light of recent precedents, it is now time to take this recommendation a step further. Because it facilitates sound decisionmaking and fulfills statutory aims and requirements, agencies should apply the social cost of greenhouse gases in all NEPA analyses involving greenhouse gas emissions. At the very least, agencies should use the social cost of greenhouse gases when other project impacts are monetized.

B. Project-Level Determinations

Use of the social cost of greenhouse gases is beneficial not only for agency decisionmaking under NEPA. Many substantive statutes also require agencies to take account of environmental and climate impacts when considering project-level proposals by individual applicants. When those proposals would entail substantial greenhouse gas emissions—such as for proposals to extract or transport fossil fuels—the agency's use of the social cost of greenhouse gases would be particularly useful and likewise facilitate an apples-to-apples comparison to other monetized project impacts. This section summarizes various key statutes that govern federal decisionmaking over fossil-fuel extraction and transportation, highlighting provisions that require a balancing of environmental and economic impacts and explaining how use of the social cost of greenhouse gases best facilitates that comparison.

The statutes and processes discussed in this section are not meant as an exhaustive list. For any project-level determination in which the reviewing agency has the legal authority or obligation to consider climate change impacts, the social cost of greenhouse gases provides the best means to rationally meet that obligation.

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[31] Interagency Working Group on the Social Cost of Greenhouse Gases, 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).

[32] Memorandum from Council on Env't Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews 2 (issued Aug. 1, 2016; withdrawn Apr. 5, 2017; under review Feb. 19, 2021, for revision and update).

1. Energy Leasing, Permitting, and Extraction

Through its management of roughly 640 million acres of federal land (about 28% of U.S. land mass)[33] and 2.5 billion acres of the Outer Continental Shelf,[34] the federal government controls vast reserves of fossil fuels. In total, fossil fuels from public lands and waters make up approximately one quarter of all U.S. carbon dioxide emissions.[35] According to a recent estimate, in fact, U.S. federal lands would rank fifth in the world for greenhouse gas emissions if they were their own country.[36]

The Department of the Interior is the agency primarily responsible for the management of fossil-fuel leasing and extraction on federal lands and waters, through two main sub-agencies: the Bureau of Land Management ("BLM") oversees fossil-fuel leasing on federal lands, while the Bureau of Ocean Energy Management ("BOEM") oversees fossil-fuel leasing in federal waters. A third Interior sub-agency, the Office of Surface Mining Reclamation and Enforcement ("OSM"), regulates surface coal-mining operations including approving mining plans for federally-leased coal. Other agencies, including the U.S. Forest Service (which is part of the Department of Agriculture) also have roles in managing leases on federal lands or in approving the roads and infrastructure necessary to develop fossil fuels on federal lands; though the specific statutory provisions applicable to such other agencies may differ, the general principles discussed below still apply.

Under their respective authorities, each relevant sub-agency must manage federal lands for the public interest, balancing environmental and economic values.[37] Such an assessment requires consideration of climate change. Because the social cost of greenhouse gases captures a wide range of climate change impacts in the common metric of money, it best allows these agencies to evaluate the relevant environmental considerations and facilitates an even-handed comparison with projected economic

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[33] Congressional Research Service, Federal Land Ownership: Overview and Data 1 (updated Feb. 21, 2020).

[34] Bureau of Ocean Energy Management, About BOEM: Fact Sheet 1–2 (updated Jan. 2021), https://www.boem.gov/sites/default/files/documents/newsroom/fact-sheets/BOEM-FactSheet-About.pdf.

[35] *See* Matthew D. Merrill et al., *Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2005–14*, U.S. GEOLOGICAL SURVEY 8 (2018), https://pubs.usgs.gov/sir/2018/5131/sir20185131.pdf

[36] Federal Lands Emissions Accountability Tool, The Wilderness Society, https://www.wilderness.org/articles/article/federal-lands-emissions-accountability-tool (last visited May 3, 2021).

[37] For instance, the Mineral Leasing Act requires Interior to "[e]nsure the sale of the production of such leased land to the United States and to the public . . . for the protection of the interests of the United States, … and for the safeguarding of the public welfare." 30 U.S.C § 187. The Federal Land Policy and Management Act ("FLPMA"), which governs onshore leasing, sets forth the policy that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." 43 U.S.C. § 1701(a)(8). And the Outer Continental Shelf Lands Act, which governs offshore leasing, calls for Interior to promote offshore energy development in a manner that "considers economic, social, and environmental values of the renewable and nonrenewable resources," *id.* § 1802(3), and to "to "select the timing and location of leasing, to the maximum extent practicable, so as to obtain a proper balance between the potential for environmental damage, the potential for the discovery of oil and gas, and the potential for adverse effects on the coastal zone," *id.* § 1344(a)(3). And the U.S. Forest Service has broad discretion to make lands under its jurisdiction available for mineral leasing, 16 U.S.C. § 482, which it should exercise consistent with its mandate to "serve the national interest . . . based on a comprehensive assessment" of land uses including "through analysis of environmental and economic impacts," *id.* § 1600(3).

benefits of resource extraction. Yet the federal government has typically (though not always) eschewed the social-cost metrics in previous land-management analyses, causing a minimization of climate impacts and a skewed analysis that prioritizes economic benefits over the environment and public health.

In a recent analysis, the Office of Surface Mining determined that a proposed coal mine expansion would result in the emission of 172 million metric tons of carbon dioxide equivalent annually. Had it applied the social cost of greenhouse gases, OSM would have recognized that this volume of emissions equates to nearly $9 billion in annual climate costs—a figure that significantly exceeds the projected economic benefits of the mine expansion. Instead, however, OSM brushed aside these climate impacts as insignificant.

Though examples abound, an OSM analysis from 2018 underlying the approval of a proposed coal mine expansion particularly illustrates the limitations of prevailing methodologies compared to the decisionmaking rigor that the social cost of greenhouse gases would provide. In that analysis, OSM determined that the coal mine expansion would result in the emission of an additional 172 million metric tons of carbon dioxide equivalent annually.[38] Had it applied the social cost of greenhouse gases, OSM would have recognized that this volume of emissions equates to nearly $9 billion in annual climate costs[39]—a figure that significantly exceeds the projected economic benefits of the mine expansion.[40] Instead, however, OSM brushed aside these climate impacts as insignificant after calculating that the proposal's greenhouse gas emissions collectively equate to approximately 0.44% of the annual global total.[41] Applying the social cost of greenhouse gases would have corrected OSM's assessment of climate effects, facilitated comparison to the project benefits, and enabled sounder decisionmaking.

This example from OSM is not an outlier, as agencies have continually approved leasing and extraction plans that would cause vast climate harm without using the social cost values to contextualize their greenhouse gas emissions. While failing to monetize greenhouse gas emissions, however, those agencies

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[38] The Environmental Assessment presents these emissions as 190 million short tons. Office of Surface Mining, Bull Mountains Mine No. 1 Federal Mining Plan Modification Environmental Assessment 56 (2018), *available at* https://www.wrcc.osmre.gov/programs/federalLands/NEPA_SignalPeak_EA_080318-051118.pdf. 190 million short tons equals 172.36 million metric tons.

[39] The Working Group's central social cost estimation for 2020 carbon dioxide emissions is $51. 172.36 million metric tons times $51/ton equals $8.79 billion.

[40] While OSM did not directly report the total value of extracted coal, it did estimate that the mine expansion will result in 86.8 million tons of coal per year that will sell for $32.50 per ton. OSM, *supra* note 39, at 18, G-6. 86.8 million multiplied by $32.50 equals $2.821 billion—less than one-third of the annual climate damage cost.

[41] *Id.* at 57.

regularly assess monetized economic values such as revenue and payroll totals. For its five-year leasing plans, BOEM even conducts a net-benefits analysis in which it seeks to capture the full economic benefits of its proposed leasing program.[42] Because the government regularly monetizes purported economic benefits, use of the social cost of greenhouse gases would enable an even-handed comparison with climate change impacts and facilitate the careful balancing that is required.

Although the federal government has rarely applied the social cost of greenhouse gases in land-management decisions, it has done so on a handful of occasions. Though representing the exception rather than the norm, these limited instances illustrate that the social cost of greenhouse gases is a useful and applicable tool for leasing and extraction decisions. In a 2016 assessment of a lease sale, for instance, BOEM explained that the social cost of greenhouse gases provides "a useful measure" that enables the agency "to incorporate the social benefits of reducing carbon dioxide emissions into its decision-making."[43] BLM also applied the social cost of greenhouse gases to assess the climate impacts of several lease sales.[44]

In addition to fossil-fuel leasing and extraction projects that increase greenhouse gas emissions, various federal agencies also have authority over the permitting of renewable-energy projects that decrease greenhouse gas emissions. There too, application of the social cost of greenhouse gases could be highly beneficial for contextualizing the project's climate benefits, which could offset any social costs from the project. For instance, in its review of a recent wind-energy proposal, the Western Area Power Administration concluded that the project would "[o]ffset approximately 900,000 metric tons of carbon dioxide emissions annually compared to typical U.S. electric generation."[45] While the Administration did not apply the social cost of greenhouse gases, doing so would have facilitated clearer comparison of climate benefits to other monetized project effects.

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[42] In its five-year leasing plan for 2017-2022, BOEM calculated climate damages using the social cost of greenhouse gases yet presented those values in a separate report rather than incorporating them into its net-benefits analysis. BOEM, Outer Continental Shelf Oil and Gas Leasing Program 2017-2022 Final Programmatic Environmental Impact Statement 2-32 (2016).

[43] BOEM, Cook Inlet Planning Area Oil and Gas Lease Sale 244 In the Cook Inlet, Alaska Final Environmental Impact Statement 4-190 to 4-191 (2016), https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=224283.

[44] *See* BLM, Little Willow Creek Protective Oil and Gas Leasing Environmental Assessment 81 (Docket No. DOI-BLM-ID-B010-2014-0036-EA) (2015), https://eplanning.blm.gov/public_projects/nepa/39064/55133/59825/DOI-BLM-ID-B010-2014-0036-EA_UPDATED_02272015.pdf; BLM, Miles City Oil and Gas Lease Sale Environmental Assessment 76 (Docket No. DOI-BLM-MT-C020-2014-0091-EA) (2014), https://www.blm.gov/sites/blm.gov/files/MT-DAKs%20MCFO%20EA%20October%202014%20Sale_Post%20for%2030%20day.pdf.

[45] Western Area Power Administration, Draft Environmental Impact Statement for the Rail Tie Wind Project ES-iii (2021).

This past April, Interior Secretary Deb Haaland issued a Secretarial Order recognizing that the social cost of greenhouse gases provides a "useful measure to assess the climate impacts of [greenhouse gas] emission changes for Federal proposed actions, in addition to rulemakings," emphasizing the tool as "essential . . . to quantify the costs and benefits associated with a proposed action's [greenhouse gas] emissions and relevant to the choice among different alternatives being considered."[46] While the Secretarial Order strongly endorsed the use of the social cost of greenhouse gases, it stopped short of requiring the tool in all relevant land-management decisions. The Working Group should emphasize that such usage is indeed appropriate and beneficial, as the social cost metrics offer the best methodology for agencies to balance economic development and environmental protection as their governing statutes require.

> The social cost of greenhouse gases provides a "useful measure to assess the climate impacts of [greenhouse gas] emission changes for Federal proposed actions, in addition to rulemakings."
>
> *– Interior Secretary Deb Haaland*

2. Energy Transportation and Transmission

The federal government also exerts significant control over fossil-fuel transportation and transmission. Here, too, applicable statutes require the responsible agencies to regulate for the public interest, considering both economic and environmental impacts. Because the social cost of greenhouse gases enables such balancing and offers the best method to contextualize climate effects, it is similarly effective for informing these determinations.

Perhaps the most significant determination for fossil-fuel transportation and transmission is the approval of interstate natural-gas pipelines by the Federal Energy Regulatory Commission ("FERC"). With natural gas distribution, transmission, and storage directly accounting for nearly 200 million metric tons of carbon dioxide equivalent annually[47]—not to mention the substantial emissions from fossil fuel extraction and combustion that these pipelines indirectly facilitate[48]—these pipelines impose a substantial climate cost. FERC is required to consider that climate cost in deciding whether to grant a "certificate of public convenience and necessity" permitting interstate pipeline construction.[49] This standard encompasses "all

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[46] Secretarial Order 3399 §5(b), Department-Wide Approach to the Climate Crisis and Restoring Transparency and Integrity to the Decision-Making Process (Apr. 16, 2021).

[47] EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2019 ES-20 tbl.ES-4 (2020) (line for "natural gas systems").

[48] *See* James Bradbury et al., *Greenhouse Gas Emissions and Fuel Use Within the Natural Gas Supply Chain*, DEP'T OF ENERGY 4 (2015) (attributing roughly 80 percent of all greenhouse emissions generated by natural-gas supply chain to combustion).

[49] *See, e.g.*, *Sierra Club v. FERC*, 867 F.3d 1357, 1373 (D.C. Cir. 2017).

factors bearing on the public interest," with the Supreme Court recognizing that FERC must balance environmental and economic considerations.[50]

Like with fossil-fuel extraction, use of the social cost of greenhouse gases would enable FERC to contextualize the real-world climate impacts of proposed pipelines and directly compare those impacts to the project's purported economic benefits.[51] For this reason, use of the social cost metrics in public convenience and necessity determinations would enable balanced and rational decisionmaking. To date, however, FERC has consistently resisted the social cost methodology, offering an array of excuses for why the tool is inapplicable.[52] Among other false justifications, FERC has repeatedly claimed that the social cost of greenhouse gases is meant for rulemaking and thus "not appropriate for use in project-level . . . review."[53] Clear guidance from the Working Group could dispel this notion.

Another agency with substantial authority over fossil-fuel transportation is the Surface Transportation Board, which licenses the construction and operation of new railroad lines including lines that are designed to transport coal. These railroads can produce substantial direct and indirect greenhouse gas emissions, with seventy percent of coal transported by rail nationwide and coal accounting for almost half of all tonnage sent by rail as of 2015.[54] And akin to FERC's authority over natural gas pipelines, the Surface Transportation Board must account for these climate impacts in assessing whether proposed rail lines are consistent with the "public convenience and necessity."[55] On several occasions, federal courts have vacated approvals because the Board did not adequately consider the resulting greenhouse gas emissions.[56]

Applying the social cost of greenhouse gases would enable the Board to compare climate and economic impacts, and thus help facilitate a rational assessment of whether the proposed rail line is in the public interest. For a recent proposal to construct an 85-mile rail line in the Uinta Basin in Utah and Colorado, for instance, the Board estimated economic benefits such as tax revenue and labor income,[57] yet declined to contextualize the project's more than 100,000 metric tons of greenhouse gas equivalent (from operational emissions alone) using the social cost of greenhouse gases.[58] Applying the social cost of

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[50] *NAACP v. Federal Power Commission*, 425 U.S. 662 (1976); *see also id*. at 670 & n.6.

[51] Avi Zevin, *Regulating the Energy Transition: FERC and Cost-Benefit Analysis*, 45 COLUM. J. ENV'T L. 510–14 (2020) (detailing how FERC could monetize these benefits).

[52] *See* Jayni Hein et al., Inst. for Pol'y Integrity, *Pipeline Approvals and Greenhouse Gas Emissions* 39–51 (rebutting FERC's myriad justifications).

[53] *Texas Eastern Transmission, LP,* 173 FERC ¶ 61,072, P 37 & n.58 (Oct. 15, 2020) (citing previous decisions).

[54] Jayni Hein & Peter Howard, Inst. for Pol'y Integrity, *Reconsidering Coal's Fair Market Value* 10 (2015), https://policyintegrity.org/files/publications/Coal_fair_market_value.pdf.

[55] 49 U.S.C. § 10901(c).

[56] *See N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1082 (9th Cir. 2011) (holding that the agency violated NEPA by failing to assess the potential environmental impacts of approved coal mine); *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003) (vacating approval of new rail lines servicing coal mines because the agency failed to assess adverse environmental impacts from increased coal combustion).

[57] Draft Environmental Impact Statement, Uinta Basin Railway 3.13-28 to -31 (2020).

[58] *Id*. at 3.7-21.

greenhouse gases to assess the impact of those emissions would facilitate sounder decisionmaking by enabling the Board to assess whether the project's purported benefits justify its environmental costs.

Finally, the social cost of greenhouse gases could inform determinations about electricity transmission planning. Electricity currently accounts for about one-third of domestic greenhouse gas emissions,[59] and it is widely agreed that "[n]ew high voltage transmission lines can increase the availability of carbon-free energy and facilitate the replacement of energy generated by fossil fuels," thereby reducing greenhouse gas emissions.[60] Various federal agencies, in particular FERC and the Department of Energy ("DOE"), have broad jurisdiction over transmission planning, which they could use to help decarbonize the electricity grid.[61] Use of the social cost of greenhouse gases would enable regulators to assess the climate implications of transmission planning decisions, facilitating determinations that promote cost-effectively decarbonization.

3. Energy Exports and Imports

The federal government also exerts significant authority over the import and export of fossil fuels. In particular, the import or export of natural gas requires a determination from DOE that the proposed transport is "consistent with the public interest."[62] This public interest assessment encompasses a broad "range of factors" including "economic impacts, international impacts, security of natural gas supply, and environmental impacts."[63] Thus, assessing whether to permit natural-gas imports or exports requires balancing environmental impacts, including effects on climate change, with economic considerations and other factors bearing on the public interest. Those climate change impacts are substantial: The United States collectively imports and exports over 170 billion cubic meters of natural gas annually, ranking fourth in the world in each category.[64]

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[59] U.S. Energy Info. Admin., *Frequently Asked Questions: How Much of U.S. Carbon Dioxide Emissions Are Associated With Electricity Generation?*, https://www.eia.gov/tools/faqs/faq.php?id=77&t=e (last updated May 14, 2021).

[60] FERC, *Report on Barriers and Opportunities for High Voltage Transmission* (2020), *available at* https://www.congress.gov/116/meeting/house/111020/documents/HHRG-116-II06-20200922-SD003.pdf [hereinafter "FERC Congressional Report"]; *see also* Avi Zevin et al., *Building a New Grid without New Legislation: A Path to Revitalizing Federal Transmission Authorities*, 48 Ecol. L.Q. __ (forthcoming 2021) (manuscript at 3, *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3727699) ("There is now broad agreement (if not a consensus) that new, long-distance, high-voltage transmission lines will be indispensable if the United States is to integrate enough renewable generation to decarbonize the electric system.").

[61] *See generally* FERC Congressional Report, *supra* note 59, at 5–6.

[62] 15 U.S.C. § 717b(a).

[63] DOE, Final Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, DOE/FE Order No. 3643-A, at 10 (Aug 20, 2020), https://www.energy.gov/sites/default/files/2020/08/f77/rod-eis-0512-alaska-lng-2020-08-20.pdf.

[64] CIA, World Factbook: United States, https://www.cia.gov/the-world-factbook/countries/united-states/.

Like with fossil-fuel extraction and transmission, application of the social cost of greenhouse gases would enable DOE to rationally consider climate impacts alongside other costs and benefits in assessing whether a proposed fossil-fuel import or export project satisfies the public interest. The agency's current practices, in contrast, do not enable a meaningful weighting of greenhouse gas impacts. For instance, DOE recently determined that a proposed liquefied natural gas export facility would result in the export of 929 billion cubic feet of natural gas per year[65]—the equivalent of over 50 million metric tons of carbon dioxide annually.[66] DOE could have determined, using current valuations of the social cost of greenhouse gases, that this equates to about $2.5 billion in climate damages per year[67]—a figure that substantially exceeds the project's payroll totals, for instance.[68] Instead, DOE declined to apply the social cost of greenhouse gases and approved the export project despite finding that it "could not determine whether [the] project's contribution to climate change would be significant."[69] Clear guidance from the Working Group could help ensure that DOE applies the social cost valuations in future determinations to appropriately weigh the climate impacts of import and export projects against other factors bearing on the public interest.

> The Department of Energy recently determined that a proposed liquefied natural gas export facility would result in the export of over 50 million metric tons of carbon dioxide annually. DOE could have determined that this equates to about $2.5 billion in climate damages per year. Instead, DOE stated that it "could not determine whether [the] project's contribution to climate change would be significant," and approved the export project without further climate analysis.

The social cost of greenhouse gases could also be useful if the executive branch chooses to impose tariffs on fossil-fuel imports.[70] Upon the recommendation of the Department of Commerce that "an article is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security," the President has authority to impose tariffs on the importation of the

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[65] DOE Final Opinion, *supra* note 62, at 1.

[66] To convert from cubic feet to metric tons of carbon dioxide, we used the EPA's Greenhouse Gas Equivalencies Calculator, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

[67] This calculation uses the Working Group's central social cost estimation for 2020 carbon dioxide emissions of $51 per metric ton. Multiplied by 50 million metric tons, this equals over $2.5 billion.

[68] FERC, Final Environmental Impact Statement-Alaska LNG Project 4-638 tbl.4.11.2-8 (2020).

[69] DOE Final Opinion, *supra* note 62, at 26 (internal quotation marks omitted).

[70] Imposition of tariffs could be considered under "budgeting," but is included under this section for the reader's convenience.

product in question.[71] If the executive branch chooses to use this authority with respect to fossil fuels (or products whose production emits fossil fuels), such a tariff could be calculated using the social cost of greenhouse gases. Imposing that monetary value as a tariff, depending on the fossil fuel's carbon content, would internalize this climate externality and thereby make the international energy market more efficient.

4. Wholesale Electricity Rates

Another area where the federal government exerts significant power is over wholesale electricity rates. In particular, the Federal Power Act confers upon FERC broad authority to approve proposed wholesale electricity rates. Under that statute, FERC must ensure that wholesale rates are "just and reasonable,"[72] a standard that enables the agency to consider and address market imperfections.[73] If it rejects a proposed rate, FERC may set just and reasonable rates for the wholesale market.[74] In that case, the agency must demonstrate "that the new rate is just, reasonable and not unduly discriminatory"[75]—a standard that accords the agency broad discretion to set wholesale rates.[76]

> The external damages of carbon dioxide emissions from electricity generation caused roughly $87 billion of climate harm in the year 2017. Internalizing the cost of greenhouse gas pollution into wholesale energy rates would address this market failure, and falls within FERC's authority to ensure that rates are "just and reasonable" and protect the public interest.

The impact of greenhouse gas pollution is a substantial externality in the electricity market. According to a recent estimate, the external damages of carbon dioxide emissions from electricity generation caused roughly $87 billion of climate harm in the year 2017, highlighting the need to consider climate externalities in setting wholesale electricity rates.[77] Because producers do not bear these external costs, however, they do not sufficiently account for them and thereby produce more carbon-intensive electricity than is socially optimal. Internalizing the costs of greenhouse gas pollution

[71] 19 U.S.C. § 1862(c).

[72] 16 U.S.C. § 824d(a).

[73] See *Ill. Cities of Bethany v. Fed. Energy Regulatory Comm'n*, 670 F.2d 187, 191 (D.C. Cir. 1981).

[74] 16 U.S.C. § 824e(a).

[75] *Id.*

[76] *Morgan Stanley Cap. Grp. Inc. v. Pub. Util. Dist. No. 1 of Snohomish Cty., Wash.*, 554 U.S. 527, 532 (2008) ("[W]e afford great deference to the Commission in its rate.").

[77] Bethany A. Davis Noll & Burcin Unel, *Markets, Externalities, and the Federal Power Act: The Federal Energy Regulatory Commission's Authority to Price Carbon Dioxide Emissions*, 27 N.Y.U. ENV'T L. J. 1, 6–7 (2019).

into wholesale energy rates would address this market failure, and falls within FERC's authority to ensure that rates are "just and reasonable" and protect the public interest.[78]

Accordingly, FERC should consider the social cost estimates when evaluating and setting wholesale electricity rates to internalize climate externalities onto fossil-fuel producers. As this example shows, the social cost of greenhouse gases is critical not only for assessing whether a project-level proposal is in the public interest, but can also be directly incorporated into rate assessments to internalize climate costs.

C. Planning and Performance Reports

The social cost of greenhouse gases can also be useful for long-term planning and review. Under the Government Performance and Results Act ("GPRA"), agencies must develop long-term strategic plans,[79] annual performance plans laying out goals for the upcoming year,[80] and performance reports assessing the agency's performance for the previous year against its goals.[81] These reports should also fit into the bigger picture of the federal performance plan, which sets out interagency strategy as well as cross-agency priority goals ("CAPs").[82]

Incorporating the social cost of greenhouse gases into these assessments would allow for greater insight into the progress of different agencies in combating climate change and would facilitate intra- and interagency comparisons of program efficacy that could be used to refine federal efforts. For instance, as part of the CAPs set in 2015, the White House set goals of doubling the share of government energy consumption attributable to renewable sources in five years and reducing direct greenhouse gas emissions by 40% in ten years.[83] Use of the social cost of greenhouse gases would help agencies evaluate where emission reductions would be most cost-effective by enabling agencies to compare the climate benefits gained against any additional compliance costs or other monetized effects, providing structure to an evaluation process that may have varied across agencies.[84] Insofar as the White House extends existing CAPs to reach emissions resulting from agency regulatory or project-management programs, the social cost of greenhouse gas emissions would also be a useful tool to measure agency progress by allowing agencies to better weigh the savings in climate costs against other metrics of efficacy.

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[78] *Id.* at 43.

[79] 5 U.S.C. § 306.

[80] 31 U.S.C. § 1115(b).

[81] *Id.* § 1116.

[82] *Id.* § 1115(a).

[83] *Cross-Agency Priority Goals*, https://obamaadministration.archives.performance.gov/cap-goals-list.html.

[84] *Compare* 2016 EPA Strategic Sustainability Enforcement Plan 14, https://www.epa.gov/sites/production/files/2016-09/documents/epa_2016_strategic_sustainability_performance_plan.pdf ("EPA has a thorough vetting process to test and implement energy conservation and GHG emissions reduction strategies prior to full-scale implementation."), *with* 2016 U.S. Dep't of Education Strategic Sustainability Enforcement Plan 10, https://www2.ed.gov/about/reports/strat/sustainability/2016-strat-sustain-plan.pdf (stating that the Department will review its programs without describing a specific evaluation method).

The social cost of greenhouse gases can also be useful for agencies to engage in planning or evaluate progress toward climate goals in strategic plans, performance plans, and performance reports. For instance, agencies are required to establish performance goals expressed in an "objective, quantifiable, and measurable form."[85] Expressing performance goals related to greenhouse gas emissions in terms of climate cost savings, calculated using the social cost of greenhouse gases, would enable agencies to situate those goals in the context of their other goals and accomplishments, and could enable agencies to set ambitious climate goals.

For retrospective performance reports, the social cost of greenhouse gases could be similarly effective in enabling agencies to quantitatively track their performance relative to the benchmarks set in the performance plan, and to contextualize climate cost savings alongside other monetized costs. For example, pursuant to its goal of improving air quality, the Environmental Protection Agency's 2020 performance report states that the agency reduced total annual consumption of greenhouse gases by 330 million metric tons due to its Energy Star program.[86] The report quantifies $35 billion in avoided energy costs from this reduction, but does not monetize the social benefits of reducing these emissions.[87] Applying the social cost of greenhouse gases would enable agencies to objectively compare climate progress against other monetized performance metrics and thus help agencies reevaluate their climate benchmarks with a better appreciation for their widespread benefits.

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[85] 31 U.S.C. § 1115(b)(2).

[86] 2020 EPA Ann. Performance Rep. 8, https://www.epa.gov/sites/production/files/2021-01/documents/epa-fy-2020-annual-performance-report.pdf.

[87] *Id.*

II. Budgeting

The federal government should also integrate the social cost of greenhouse gases into all areas of budgeting with significant greenhouse gas implications. This includes determining administrative penalties for violations of key fossil-fuel programs, setting royalties for federal fossil-fuel leases, and assessing applications for discretionary grants. This section summarizes each of processes, including statutory hooks that enable consideration of climate damage costs in each respective process.

For the purposes of this report, "budgeting" is considered any determination that directly affects federal expenditures or receipts. The processes described in this section could alternatively be considered to fall under "decisionmaking." However these processes are classified, there is great utility in applying the social cost of greenhouse gases.

A. Administrative Penalties

The social cost of greenhouse gases can be incorporated into the assessment of federal administrative penalties to help agencies internalize the cost of greenhouse gas emissions resulting from violations of statutory programs. While each federal statute contains its own noncompliance provisions with differing guidelines, agencies generally retain broad discretion when assessing penalties. Incorporating the social cost of greenhouse gases into penalty assessments would enable agencies to more accurately reflect harms from violations when penalizing noncompliance.

Incorporating the monetary value of climate-related harms in administrative penalties is especially useful when statutory noncompliance results in significant greenhouse gas emissions. Administrative agencies that regulate the extraction, transmission, and downstream use of fossil fuels currently do not monetize climate damages resulting from noncompliance. By incorporating the social cost values into penalty calculations, agencies can internalize the climate-related harms from noncompliance, thereby punishing violators based on the damage caused and efficiently deterring future violations. Adjusting administrative penalties to reflect the social cost of greenhouse gas values thus not only facilitates compensation for the affected public but also offers significant potential to reduce emissions from noncompliance.

Several statutes in particular present opportunities for internalizing the climate costs of emissions from noncompliance. Title I of the Clean Air Act, which authorizes regulation of pollution from stationary sources (such as power plants and factories), sets a minimum penalty amount that reflects the benefits of noncompliance for the source's owner.[88] However, the statute does not limit other factors that could be used to increase the penalty beyond this minimum value.[89] The Environmental Protection Agency ("EPA") further is authorized to "adjust (and from time to time to readjust) the amount of the penalty

[88] 42 U.S.C. § 7420(d)(2)(A).

[89] *Id.*

assessment calculated or the payment schedule proposed."[90] These authorities provide EPA with broad discretion to incorporate a range of factors when assessing penalties for noncompliance, enabling consideration of the social cost of greenhouse gases to incorporate monetized climate damages in penalty calculations for violations of greenhouse gas emission standards.

The National Highway Traffic Safety Administration ("NHTSA") also has broad discretion to incorporate the social cost of greenhouse gases into penalty assessments for violations of the Corporate Average Fuel Economy ("CAFE") program, which sets vehicle fuel-efficiency standards and thus also has critical implications for greenhouse gas emissions. Like Title I of the Clean Air Act, the Energy Policy and Conservation Act (under which the CAFE program is administered) prescribes a floor civil penalty amount, which is a function of each fleet's degree of noncompliance above the mandated efficiency standard.[91] The statute further provides, subject to certain limitations, that NHTSA may increase the penalty if doing so "will result in, or substantially further, substantial energy conservation for automobiles."[92] This broad authority enables NHTSA to reconsider and potential raise the penalty amount to reflect external damages, including climate harm calculated using the social cost of greenhouse gases.

Other than adjusting the penalty for inflation pursuant to federal law, however, NHTSA has never raised the penalty for noncompliance under the CAFE standards, even as the harms of climate change have come into greater focus. Thus, even the highest penalty paid by a single manufacturer for violating CAFE standards—a $77 million penalty paid by Fiat Chrysler in 2018 for failing to meet fuel economy standards for the 2016 model year[93]—likely failed to fully capture the total climate damages resulting from this violation (not to mention the costs from local pollution and consumer fuel usage).[94] While the subsequent adjustment in the minimum CAFE penalty —from $5.50 per violation to $14 in 2019 to account for

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[90] *Id.* § 7420(b)(8).

[91] 49 U.S.C. § 32912(b).

[92] *Id.* § 32912(c)(1)(A)(i).

[93] *See* Civil Penalties, 84 Fed. Reg. 36,007, 36,026 (July 26, 2019) (to be codified at 49 C.F.R. pt. 578).

[94] Fiat's penalty was for its 2016 model year DP, whose fleet size of 577,051 had an average mileage of 31.8 miles per gallon against a standard of 35.7. Manufacturer Fuel Economy Performance Report, CAFE PUB. INFO. CTR., https://one.nhtsa.gov/cafe_pic/CAFE_PIC_Mfr_LIVE.html (select "Fiat Chrysler" for Model, "2016" for Model Year, "Domestic Passenger Car (DP)" for Fleet, and click "Search"). Using the calculations provided at EPA, Greenhouse Gas Emissions from a Typical Passenger Vehicle 1, 1–2 (Mar. 2018), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U8YT.pdf, and based on NHTSA's assessment that the average passenger vehicle drives 152,137 miles in its lifetime, NHTSA, Vehicle Survivability and Travel Mileage Schedules 1 (2006), https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809952, we can project that Fiat's violation resulted in over $132.7 million in climate harm over the fleet's lifetime using the Working Group's conservative estimate of $51 for the social cost of carbon. Calculation:

$$\left(\frac{11{,}500\text{ mi}}{\text{yr}} \text{x} \frac{\text{gal}}{31.9\text{ mi}}\right) - \left(\frac{11{,}500\text{ mi}}{\text{yr}} \text{x} \frac{\text{gal}}{35.7\text{ mi}}\right) = \frac{38.373\text{ gals}}{\text{yr}} \text{ x } 577{,}051 \text{ cars in fleet} = 22{,}143{,}178 \text{ gals/yr}$$

$$\frac{22{,}143{,}178\text{ gallons}}{\text{year}} \text{x } \frac{8{,}887\text{ g CO2}}{\text{gallon}} \text{x} \frac{1\text{ ton CO2}}{10^6\text{g CO2}} \text{ x} \frac{\$51}{\text{ton CO2}} = \$10{,}036{,}108 \text{ anticipated damages per year}$$

Based on an average lifetime of 152,137 miles: $\frac{152{,}137\text{ mi x yr}}{11{,}500\text{ mi}}$ = 13.22 yrs x $10.036 million = $132.77 million in anticipated climate damages over the fleet's lifetime due to noncompliance.

decades of inflation[95]—better internalizes the climate damages from noncompliant emissions, NHTSA may wish to reconsider the penalty amount to account for monetized externalities (both climate and local pollution) after the Working Group updates its social cost valuations next year.

In addition to the penalties for downstream usage, the leasing and transmission statutes discussed above also frequently provide leeway for agencies to account for climate damages in administrative penalties. Applying the cost of greenhouse gases could prove useful if and when administrative agencies impose conditions limiting greenhouse gas pollution. A recent study by the United States Geological Survey found that emissions from fossil fuel extraction on both onshore and offshore federal lands amounted to 1.279 billion metric tons of carbon dioxide equivalent in 2014 alone.[96] Because fossil-fuel extraction on leased federal lands releases such high volumes of greenhouse gases, the penalties associated with violating leases for these lands present an opportunity to internalize the cost of climate damages from noncompliant emissions. For instance, BOEM "consider[s] the severity of the violations," among other factors,[97] in administering penalties when an oil company "fails to comply with . . . any term of a lease, license, or permit issued [by BOEM], or any regulation or order issued" by the agency.[98] The "severity of the violations" consideration could include external climate-related damages stemming from noncompliance, thus enabling BOEM to incorporate the social cost of greenhouse gases in assessing penalties.

Similarly, FERC has discretion to incorporate the social cost of greenhouse gases when assessing penalties under the NGA for noncompliance with the terms and conditions of a pipeline certificate. Civil penalties assessed by FERC are subject to a high cap of $1 million per day.[99] When assessing penalties, FERC is authorized to consider "the nature and seriousness of the violation,"[100] which leaves discretion for FERC to consider externalities and monetize the climate harm from noncompliance. Doing so would internalize the harms of climate pollution and could enable FERC to judiciously enforce any greenhouse gas emission standards that it may impose in the future.

> Using the social cost of greenhouse gases to accurately reflect climate harms from noncompliance can increase penalty rates and more effectively deter future violations, thus curtailing future emissions.

Because federal agencies often have broad discretion when setting penalties for statutory violations, penalty assessments present an opportunity to internalize the harms that result from noncompliance with

[95] *See* Civil Penalties, 84 Fed. Reg. at 36,007.
[96] Merrill et al., *supra* note 35, at 1.
[97] 30 C.F.R. § 550.1470.
[98] 43 U.S.C. § 1350(b).
[99] 15 U.S.C. § 717t-1(a).
[100] *Id.* § 717t-1(c).

emissions-related standards. Using the social cost of greenhouse gases to accurately reflect climate harms from noncompliance can increase penalty rates and more effectively deter future violations, thus curtailing future emissions. Therefore, the Working Group should recommend that agencies consider incorporating the social cost of greenhouse gases into penalty assessments for relevant statutory violations.

B. Mineral Royalties

Although fossil-fuel extraction on federal lands accounts for a gargantuan share of domestic greenhouse gas emissions,[101] the federal government currently does not internalize the cost of greenhouse gas pollution onto producers, resulting in an overproduction of fossil fuels. The Department of the Interior can correct this imbalance through royalty rates for mineral extraction. In particular, imposing a "carbon adder" based on the social cost of greenhouse gases as part of the royalty rate would directly internalize the climate costs of fossil-fuel extraction onto the producer, better aligning the incentivizes of producers with the public interest while ensuring that taxpayers receive fairer value for the use of public land.

Internalizing the costs of climate pollution into royalty rates is well within Interior's statutory authority. Resource-management statutes set floors for royalty rates but give the agency wide latitude to set rates above those minimums.[102] As one member of Congress explained before the statute's enactment, the Mineral Leasing Act gives Interior "practically unlimited authority as to the granting and the terms and conditions of leases."[103] By law, moreover, Interior must receive "fair market value" for any onshore or offshore leasing[104]—a broad term that allows for a wide array of considerations. Particularly given the law's concern for the environmental impacts of resource extraction and its charge for Interior to weigh those impacts in setting resource-management policy,[105] it would be both rational and lawful for Interior to account for environmental externalities in assessing the "fair market value" of resource extraction.

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[101] *See supra* notes 33–34 and accompanying text.

[102] *See* 30 U.S.C. § 226(b)(1)(A) (setting minimum royalty rate of 12.5 percent of onshore oil and gas revenues); *id.* § 207(a) (setting minimum royalty rate of 12.5 percent of surface coal revenues); 43 U.S.C. § 1337 (a)(1) (setting minimum royalty rate of 12.5 percent of offshore oil and gas revenues).

[103] 51 Cong. Rec. H14,954 (Sept. 10, 1914) (statement by Rep. Thomson). The House Report for FLPMA also recognized that communities face "onerous" burdens from fossil-fuel exploration, and expressed particular concern for "severe environmental impacts." H.R. Rep. No. 94-681, at 19–20 (1975).

[104] 43 U.S.C. § 1344(a)(4)(offshore); *id.* § 1701(a)(9) (onshore). Federal statutes provide minimum royalty rates for extraction on public lands, but do not impose maximum rates. *See* 30 U.S.C. § 226(b)(1)(A) (setting minimum royalty rate of 12.5 percent of onshore oil and gas revenues); *id.* § 207(a) (setting minimum royalty rate of 12.5 percent of surface coal revenues); 43 U.S.C. § 1337 (a)(1) (setting minimum royalty rate of 12.5 percent of offshore oil and gas revenues).

[105] *See supra* note 35.

Despite its broad authority, however, Interior's current royalty rates do not account for the costs of greenhouse gas pollution. Interior has rarely deviated from the minimum statutory rates, causing federal royalty rates to fall well below those imposed by other jurisdictions.[106] Federal rates have not been adjusted as the vast costs of climate change have come into focus; in fact, the royalty rate for onshore oil and gas drilling has not been updated since the Woodrow Wilson administration—long before the science behind climate change became established.[107] Federal royalty rates are also well below the social costs of extraction, imposing an externality on the public and incentivizing producers to take insufficient environmental precaution.[108] Calculations based on the social cost of greenhouse gases find that royalty rates would be substantially higher for coal,[109] oil, and gas[110] if they accounted for climate externalities.

Most pertinent to the subject matter of budgeting, increasing the royalty rate to internalize climate externalities using the social cost of greenhouse gases can raise billions of dollars for the federal, state, and local governments that share royalty revenues. According to one estimate, a royalty surcharge on oil and gas extraction alone, based on

Increasing the royalty rate to internalize climate externalities using the social cost of greenhouse gases can raise billions of dollars for the federal, state, and local governments that share royalty revenues. According to one estimate, a royalty surcharge on oil and gas extraction alone, based on the current social cost of greenhouse gas valuations, would increase royalty revenue by $4.5 billion while also reducing emissions by 18 million metric tons per year.

[106] For instance, the federal onshore oil and gas royalty rate of 12.5 percent (the statutory minimum) is less than the royalty rate imposed by many states for production of oil and gas on state-owned land. Many states impose royalty rates ranging from 16.67 to 20 percent. CONGRESSIONAL BUDGET OFFICE, *Options for Increasing Federal Income from Crude Oil and Natural Gas on Federal Lands* 9 (2016), https://perma.cc/SEM7-PNA5.

[107] Nicole Gentile, Ctr. for Am. Progress, *Federal Oil and Gas Royalty and Revenue Reform* (June 19, 2015), https://cdn.americanprogress.org/wp-content/uploads/2015/06/RevenueOilGas-brief.pdf?_ga=2.139983284.669068681.1615215466-1238915144.1614951824

[108] *See, e.g.*, Jayni Hein & Peter Howard, Inst. for Pol'y Integrity, *Illuminating the Hidden Cost of Coal* (2015), https://policyintegrity.org/files/publications/CoalCostsSummary.pdf ("Accounting for both methane and transportation externality costs would justify adding 70.1 percent to the current 12.5 percent surface-mine royalty rate . . . . This would justify a new royalty rate of 82.6 percent for federal surface-mined coal.").

[109] Hein & Howard, *supra* note 53, at 2 ("Accounting for both methane and transportation externality costs would justify adding 70.1 percent to the current 12.5 percent surface-mine royalty rate for Powder River Basin coal, leading to a new rate of 82.6 percent.").

[110] Brian C. Prest & James H. Stock, Nat'l Bureau of Econ. Res. Working Paper No. 28564, *Climate Royalty Surcharges* 4 (2021) (finding that climate externalities justify a 19% royalty surcharge for oil and gas extraction using the Working Group's current social cost valuations, or a 44% royalty surcharge using a $125 per metric ton social cost of carbon based on a 2% discount rate).

the current social cost of greenhouse gases valuations, would increase royalty revenue by $4.5 billion while also reducing emissions by 18 million metric tons per year.[111] Additional revenues for state and local governments would support communities that could face distributional economic impacts and transfers from a reduction in local fossil-fuel extraction, helping promote a more just transition to cleaner energy.

Given Interior's broad legal mandate to balance environmental protection and economic development in managing the federal fossil-fuel leasing program, the agency should consider adjusting federal royalty rates to internalize the costs of greenhouse gas pollution. As a first step, the Working Group can recognize that its social cost values can be applied for setting royalties.

C. Discretionary Grants

Federal agencies can also incorporate the social cost of greenhouse gases into the administration of discretionary grant programs. Agencies have broad authority to award discretionary grants under regulations from the Office of Management and Budget. In particular, agencies are instructed to develop their own "objective process of evaluating Federal award applications" with the aim "of selecting recipients most likely to be successful in delivering results based on the program objectives."[112] Numerical metrics offer an objective basis to assess grant applications under this merit review process, and the social cost of greenhouse gases would fit seamlessly into any quantified assessment and allow an agency to contextualize the project's climate impacts (positive or negative) against its budget and other effects. In fact, several agencies use cost-benefit analysis to assess grant applications, where the social cost of greenhouse gases can be particularly useful.

The Department of Transportation ("DOT") in fact already uses the social cost of greenhouse gases to assess discretionary grants through cost-benefit analysis. Under the Rebuilding American Infrastructure with Sustainability and Equity (known as RAISE) program, for instance, DOT provides discretionary grants for investment in road, rail, transit, and port projects, distributing nearly $9 billion in grant funding since 2009.[113] Under the Infrastructure for Rebuilding America program, DOT provides grants for certain regional transportation projects.[114] For both of these programs and others, DOT requests applicants to submit a cost-benefit analysis.[115] Agency guidance setting out best practices for applicants explicitly

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[111] *Id.* at 17 tbl.3 (finding that a 19% royalty surcharge on federal oil and gas extraction, based on the current social cost of greenhouse gases valuations, would produce $14.1 billion in annual royalties, compared to $9.6 billion under current royalty figure).

[112] 2 C.F.R § 200.205.

[113] About RAISE Grants, DOT, https://www.transportation.gov/RAISEgrants/about (last updated May 14, 2021).

[114] Infrastructure for Rebuilding America, DOT, https://www.transportation.gov/buildamerica/financing/infra-grants/infrastructure-rebuilding-america (last updated Mar. 17, 2021).

[115] *See* DOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs 5 (2021), https://www.transportation.gov/sites/dot.gov/files/2021-02/Benefit%20Cost%20Analysis%20Guidance%202021.pdf (explaining that "[t]he information provided in the applicants' [cost-benefit analyses] will be evaluated by [DOT] and used to help ensure that the available funding under the programs is devoted to projects that provide substantial economic benefits to users and the Nation as a whole, relative to the resources required to implement those projects"). DOT should update its recommended discount rates and damage schedules pursuant to any future updates from the Working Group.

endorses the use of the Working Group's social cost valuations.[116] By using the social cost of greenhouse gases in evaluating grant applications, DOT is able to contextualize climate costs or benefits with other project effects and incorporate climate impacts seamlessly into the merit review process.

Other agencies could follow suit. For instance, the Department of Housing and Urban Development ("HUD") provides Community Development Block Grant Mitigation funds to communities that are recovering from natural disasters through the Rebuild by Design program. HUD requires applicants to provide a cost-benefit analysis as part of the application, and in fact even recognizes that greenhouse gas impacts are a relevant environmental value as part of that analysis, but does not specifically endorse the social cost of greenhouse gases.[117] Clearer guidance that explicitly endorses the Working Group's damage estimates would ensure consistency and promote energy-efficiency in project design by ensuring that climate impacts are given proper weight alongside other costs and benefits.

By using the social cost of greenhouse gases in evaluating grant applications, the Department of Transportation is able to contextualize climate costs or benefits with other project effects and incorporate climate impacts seamlessly into the merit review process.

Even without requiring formal cost-benefit analyses in grant applications or evaluations, the social cost of greenhouse gases can be highly useful to federal agencies in administering discretionary grant programs. An agency that chooses to evaluate applications in a manner other than calculating net benefits still should be aware of the cost that a project's emissions impose on society (or benefits from an energy-saving project) and should factor that into its assessment. Instead of looking at the emissions in terms of tons, the social cost of greenhouse gases allows decisionmakers to view the cost of emissions in a manner that is more salient and easily understood, with impacts that can be more readily compared against other effects. Accordingly, the Working Group should recommend that agencies fully integrate the social cost of greenhouse gases into the administration of any discretionary grant programs with significant greenhouse gas implications.

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[116] *Id.* at 34–35 tbl.A-6; 40–41. Previous DOT guidance documents on cost-benefit analysis for former grant programs, such as the Transportation Investment Generating Economic Recovery (or TIGER) program, has also recommended the Working Group's social cost values for use in cost-benefit analysis. *See* DOT, Benefit-Cost Analysis (BCA) Research Guide 7 (2016), https://www.transportation.gov/sites/dot.gov/files/docs/BCARG2016March.pdf.

[117] HUD, Community Development Block Grant Disaster Recovery (CDBG-DR)-Rebuild by Design: Guidance Regarding Content and Format of Materials for Approval of CDBGDR Action Plan Amendments Releasing Funds for Construction of Rebuild by Design (RBD) Projects, Including Guidance for Benefit-Cost Analysis 1–2, 7 (Apr. 20, 2016), https://www.hud.gov/sites/documents/16-06CPDN.PDF.

III. Procurement

Use of the social cost of greenhouse gases can also be highly useful for government procurement. Agencies have broad discretion to consider environmental and climate impacts in their procurement decisions, and use of the social cost of greenhouse gases offers the best method for assessing climate impacts alongside other monetized values such as budgetary cost.

Agency procurement processes are governed by a government-wide regulation known as the Federal Acquisition Regulation ("FAR"), which is issued by the Federal Acquisition Regulatory Council.[118] Multiple sections of the FAR, as well as federal statutes, permit agencies to use the social cost of greenhouse gases in procurement. For instance, federal law instructs agencies to establish procurement practices to promote proposals "at the lowest cost or best value considering the nature of the property or service procured."[119] The FAR explains that "[b]est value must be viewed from a broad perspective and is achieved by balancing the many competing interests in the [procurement] [s]ystem,"[120] and defines the term as "the expected outcome of an acquisition that . . . provides the greatest overall benefit."[121] Because the social cost of greenhouse gases calculates the "overall benefit" or cost from an incremental decrease or increase in greenhouse gas emissions, it can be highly beneficial for assessing the "best value" among competing proposals.

At numerous junctures, in fact, the FAR recognizes that agencies should balance environmental considerations in procurement determinations. One provision, for instance, declares it the policy of the federal government to acquire goods and services in a manner that "safeguards the health of our environment" and "reduces greenhouse gas emissions from direct and indirect Federal activities."[122] Other provisions specifically recognize that agencies may assess "environmental and energy efficiency considerations" in evaluating best value.[123] Additionally, agencies are required to "[i]mplement cost-effective contracting preference programs promoting energy-efficiency … and the acquisition of environmentally preferable products and services."[124] As detailed throughout this document, the social cost of greenhouse gases offers the best method for agencies to balance environmental considerations against other monetized values, as it enables an apples-to-apples comparison of different factors.

A service contract awarded by the General Services Administration ("GSA") exemplifies how agencies have sometimes incorporated the social cost of greenhouse gases into procurement decisions. Specifically, the GSA applied the social cost of carbon to compare different carriers when awarding parcel-shipping

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[118] The council consists of the Administrator of the Office of Federal Procurement Policy, the Secretary of Defense, the Administrator of NASA, and the Administrator of General Services. 41 U.S.C. § 1302(b).

[119] *Id.* § 1702(b)(3)(B).

[120] 48 C.F.R. § 1.102-1(b).

[121] *Id.* § 2.101.

[122] *Id.* § 23.202(a).

[123] *Id.* §§ 8.405-1(f)(7). 8.405-3(a)(2)(vii).

[124] *Id.* § 23.703(a).

contracts.[125] As GSA explained, the agency "asked contractors for initial benchmarks and goals for alternative fuel and vehicle use as part of their proposals," "investigated the anticipated [greenhouse gas] emissions performance of each contractor," and then "used the . . . [social cost of carbon] estimates to monetize and compare the market and non-market economic impacts of these expected contractor emissions." The GSA then "considered these estimates alongside price and other past performance information when assessing the value of proposals" in making its ultimate selection.[126] The social cost of greenhouse gases thus enabled the GSA to monetize climate impacts and compare those effects to other monetized factors in making its procurement award.

Many other agency procurement decisions have substantial greenhouse gas implications and could be improved by a full consideration of climate impacts using the social cost of greenhouse gases. The federal government consumes over 900 million BTUs of energy annually, about three-quarters of which are attributable to the Department of Defense.[127] Agency purchases of large, energy-intensive equipment—such as aircraft or motor vehicles—could particularly benefit from a rational, economic consideration of climate impacts. For instance, the U.S. Postal Service recently announced its intention to acquire up to 165,000 new mail trucks, yet to date has declined to consider an all-zero-emissions fleet.[128] Although the Postal Service is not governed by the FAR,[129] quantification and monetization of the greenhouse gas emissions associated with various alternatives would enable the agency to rationally assess

> In a recent procurement decision for parcel-shipping contracts, the General Services Administration applied the social cost of carbon to compare different carriers. This enabled the GSA to compare climate impacts to other monetized factors in making its procurement award.

[125] GSA, GSA Includes New Environmental Features in Next-Generation Parcel Delivery (undated), https://www.gsa.gov/cdnstatic/DDS3_green_features_fact_sheet.doc.

[126] *Id.*

[127] U.S. Energy Info. Admin., *U.S. Government Energy Consumption Continues to Decline* (July 25, 2019), https://www.eia.gov/todayinenergy/detail.php?id=40192. The Department of Defense issues its own supplement to the FAR, known as the Defense Federal Acquisition Regulation, but remains subject to the FAR and its provisions discussed in this section. *See* Federal Acquisition Regulation, Dep't of Defense, https://www.acq.osd.mil/dpap/dars/far.html (explaining that FAR applies to "all [e]xecutive agencies").

[128] Notice of Intent To Prepare an Environmental Impact Statement for Purchase of Next Generation Delivery Vehicles, 86 Fed. Reg. 12,715 (Mar. 4, 2021) ("The [environmental impact statement] will evaluate the environmental impacts of the purchase and operation of the [Next Generation Delivery Vehicle], as well as a commercial off-the-shelf (COTS) vehicle alternative and a 'no action' alternative.").

[129] About, U.S. Postal Service, https://about.usps.com/manuals/spp123108/html/pp_gt_007.html ("[T]he Postal Service is not subject to the Federal Acquisition Regulation[.]").

a range of options and determine whether the benefits of more fuel-efficient vehicles justify the potentially higher cost.

While the FAR enables broad consideration of climate impacts, current regulations and guidance do not explicitly endorse the use of the social cost of greenhouse gases in procurement decisions, and agencies have not regularly monetized climate impacts in procurement. Clear guidance encouraging agencies to apply the social cost of greenhouse gases could thus facilitate more rational assessment of climate impacts in procurement.

Conclusion

The social cost of greenhouse gases can aid government decisionmaking and operations well beyond regulatory cost-benefit analysis. As this report outlines, the social cost of greenhouse gases can be highly beneficial whenever an agency seeks to integrate climate considerations into policy determinations or to internalize those damages by assigning the cost of harms to responsible parties. Relevant processes include—but are not limited to—NEPA assessment; project-level extraction, transmission, import and export, and rate determinations; agency planning and performance reports; administrative penalties; mineral royalties; discretionary grants; and procurement determinations.

Fully integrating the social cost of greenhouse gases into these areas of policymaking will require the cooperation of the many administrative agencies and departments that are responsible for these various areas. Detailed guidance from the Working Group endorsing these numerous potential uses would provide a helpful first step. Accordingly, the Working Group should issue guidance encouraging agencies to apply the social cost of greenhouse gases for any process or decision with meaningful greenhouse gas implications.