THE SOCIAL COST OF CARBON: A TOOL FOR ENVIRONMENTAL PLANNING AND CLIMATE PROGRESS

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ABSTRACT

"The cost of a thing is the amount of what I will call life which is required to be exchanged for it, immediately or in the long run."
— Henry David Thoreau

The societal costs of greenhouse gas ("GHG") emissions are increasingly visible. Climbing carbon dioxide and other GHG emissions are directly associated with human health consequences, property damage, increased flood risk, changes in energy costs, and reduction in net agricultural productivity. Yet federal policy has failed to require a comprehensible framework for assessing the carbon-related costs of federal actions to surrounding communities.

In 1970, the National Environmental Policy Act ("NEPA") was signed into law, requiring federal agencies to assess the environmental effects of proposed federal actions that will significantly impact the quality of the human environment. Currently, federal agencies are required to consider GHG emissions in NEPA Environmental Impact Statements ("EIS"). But this requirement to consider GHG emissions results in agencies simply reporting total GHG emissions, which is functionally meaningless in terms of understanding actual impacts from those emissions. Current reporting requirements under NEPA are inadequate and enable arbitrary decision-making.

Fortunately, an analytical tool exists to monetize the damages resulting from emitting one metric ton of carbon into the atmosphere. The Social Cost of Carbon ("SCC") is an economic model that transforms the cumulative impact of abstract changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services into a workable dollar value. This value can then be used to effectively weigh the environmental impacts of alternative plans under federal projects requiring NEPA analysis. It enables decisionmakers and the public alike to ask, "What is the environmental cost we are willing to pay in in pursuit of a federal project?"

Although the SCC has existed as an analytical tool to support cost-benefit analyses since 2009, NEPA does not require federal

agencies to analyze or disclose the SCC of a federal action in Environmental Impact Statements. The lack of clear guidelines to assess carbon-related impacts of federal projects on surrounding communities invites uninformed decision-making under NEPA. This Note argues that the SCC should be stabilized to avoid political fluctuations, federal agencies should be required to include SCC analysis in Environmental Impact Statements under NEPA, and carbon emissions for each federal project should be limited by a definitive SCC ceiling.

INTRODUCTION

Federal actions can have serious climate consequences if not planned cautiously in accordance with well-defined guidelines. For proposed federal actions that will significantly affect the quality of the human environment, the National Environmental Policy Act (NEPA) requires federal agencies to prepare an Environmental Impact Statement (EIS).[1] Each EIS must include a comprehensive assessment of the environmental impacts of the federal action.[2] Climate consequences are generally considered within the purview of NEPA EIS, but quantification of climate consequences is not required by NEPA.[3] However, analytical tools exist to explicitly monetize the climate damages created by federal actions.

In 2009, an Interagency Working Group (IWG) convened to estimate the Social Cost of Carbon (SCC) to assist federal agencies in performing mandatory cost-benefit analyses of regulatory actions.[4] The SCC monetizes the damages resulting from emitting one metric ton of carbon into the atmosphere.[5] It includes the value of "changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of

1. 42 U.S.C. § 4332(C) (2022).

2. *Id*.

3. *See e.g.*, Border Power Plant Working Grp. v. Dep't of Energy, 260 F. Supp. 2d 997, 1029 (S.D. Cal. 2003); *see also* Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1216 (9th Cir. 2007); *see also* 40 C.F.R. § 1502.23 (2022).

4. U.S. GOV'T ACCOUNTABILITY OFF., GAO-14-663, REGULATORY IMPACT ANALYSIS: DEVELOPMENT OF SOCIAL COST OF CARBON ESTIMATES 6, 8 (2014) [hereinafter GOV'T ACCOUNTABILITY OFF. (2014)].

5. *See* Kevin Rennert, et al., *The Social Cost of Carbon: Advances in Long-Term Probabilistic Projections of Population, GDP, Emissions, and Discount Rates*, BROOKINGS PAPERS ON ECON. ACTIVITY 223, 224 (2021). (available at https://www.brookings.edu/bpea-articles/the-social-cost-of-carbon/).

ecosystem services."[6] Thus, in principle, the SCC turns the abstract impacts of carbon emissions into a workable dollar value that can be used to more consistently determine which NEPA projects should be carried out, and which have too much of a negative environmental effect to conscionably be pursued.[7] Climate change increasingly threatens the human environment. In order to hold federal agencies accountable, and ensure informed NEPA decision-making, the SCC must be incorporated as a requirement of NEPA. Placing a dollar value on the comprehensive environmental costs of federal projects will enable more informed comparisons between project alternatives.

This Note proceeds in four parts. First, it introduces the National Environmental Policy Act (NEPA) and the Social Cost of Carbon (SCC). Second, this Note illustrates the inadequacy of current carbon emissions reporting mechanisms under NEPA. Third, this Note describes the SCC's transformations through the Obama, Trump, and Biden Administrations, and discusses the legal framework regarding incorporation of the SCC into NEPA analyses. Fourth, this Note argues that in order to reduce the arbitrary nature of NEPA approvals, three important steps must be taken. First, the SCC must be stabilized to reduce high levels of executive discretion on a calculation that should be based on scientific analysis. Second, NEPA should require federal agencies to consider the SCC in Environmental Impact Statements (EIS). Third, for cost-of-carbon analysis to be meaningful, there should be an absolute SCC cap for NEPA projects.

I. OVERVIEW OF NEPA AND THE SCC

A. The National Environmental Policy Act (NEPA)

On January 1, 1970, the National Environmental Policy Act (NEPA) was signed into law, requiring federal agencies to assess the

6. INTERAGENCY WORKING GRP. ON SOC. COST OF GREENHOUSE GASES, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON, METHANE, AND NITROUS OXIDE INTERIM ESTIMATES UNDER EXECUTIVE ORDER 13990 2 (2021), https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf [hereinafter INTERAGENCY WORKING GRP. (2021)].

7. *See* ENV'T PROT. AGENCY, SOCIAL COST OF CARBON 1–2 (2016), https://www.epa.gov/sites/default/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf [hereinafter EPA, SCC].

environmental impacts of proposed federal actions.[8] NEPA's stated purposes include:

> To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.[9]

Title I of NEPA directs federal agencies to analyze the environmental impacts of federal actions.[10] Before carrying out a proposed action, federal agencies will determine whether a Categorical Exclusion (CATEX) applies, such that NEPA does not apply to the proposed action because the type of action normally does not have a significant effect on the human environment.[11] Some Categorical Exclusions for the Department of Transportation, for example, include "(1) [a]dministrative procurements (e.g. general supplies) and contracts for personal services; (2) [p]ersonnel actions (e.g. promotions, hirings); [and] (3) [p]roject amendments (e.g. increases in costs) which do not significantly alter the environmental impact of the action."[12] If a CATEX does not apply, the agency will prepare an Environmental Assessment (EA) of the action, including its purpose, alternatives, environmental impacts of the action and its alternatives, and a list of agencies and individuals consulted.[13] After developing an EA, the federal agency will determine whether the proposed action presents significant environmental impacts.[14] If so, a

8. *See* 42 U.S.C. § 4321 (2022); *see also What is the National Environmental Policy Act?*, ENV'T PROT. AGENCY, https://www.epa.gov/nepa/what-national-environmental-policy-act (last updated Nov. 17, 2021).

9. 42 U.S.C. § 4321.

10. 42 U.S.C. § 4332 (2022).

11. *See National Environmental Policy Act Review Process*, ENV'T PROT. AGENCY, https://www.epa.gov/nepa/national-environmental-policy-act-review-process (last updated Nov. 17, 2022); *see also Categorical Exclusions*, COUNCIL ON ENV'T QUALITY, https://ceq.doe.gov/nepa-practice/categorical-exclusions.html (last visited Nov. 17, 2022); *see also* 40 C.F.R. § 1508.1(d) (2022).

12. DEP'T OF TRANSP., PROCEDURES FOR CONSIDERING ENVIRONMENTAL IMPACTS DOT 5610.1C 4 (1979); *see also* COUNCIL ON ENV'T QUALITY, LIST OF FEDERAL CATEGORICAL EXCLUSIONS (2021), https://ceq.doe.gov/nepa-practice/categorical-exclusions.html (consolidating all categorical exclusions for each federal agency).

13. *See* 42 U.S.C. § 4332(C); *see also What is the National Environmental Policy Act?*, *supra* note 8.

14. *What is the National Environmental Policy Act?*, *supra* note 8.

more comprehensive Environmental Impact Statement (EIS) will be necessary.[15] Section 102(C) of NEPA requires all agencies of the federal government to submit a detailed EIS in "every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment."[16] These environmental statements must include:

> (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.[17]

Title II of NEPA establishes the Council on Environmental Quality (CEQ).[18] The CEQ is located within the Executive Office of the President and is composed of three members appointed by the President with the advice and consent of the Senate.[19] The members are expected to analyze and interpret environmental trends and formulate and recommend national policies to the President to promote the improvement of environmental quality.[20] In doing so, the CEQ is expected to remain conscious of the scientific, economic, social, aesthetic, and cultural needs and interests of the nation.[21] In 1977, President Carter issued Executive Order 11,991, giving the CEQ authority to issue regulations to federal agencies for the implementation of the procedural provisions of NEPA.[22] Some courts have held that CEQ guidance is binding on all federal agencies.[23] The Supreme Court has not gone *as* far, but has still held that CEQ guidance is entitled to "substantial deference."[24] Thus, CEQ guidance has a large impact on how federal agencies prepare Environmental Impact Statements under NEPA.

15. *See id.*
16. 42 U.S.C. § 4332(C).
17. 42 U.S.C. § 4332(C)(i)–(v).
18. 42 U.S.C. § 4342 (2022).
19. *Id.*
20. *Id.*; 42 U.S.C. § 4344(2), (4) (2022).
21. 42 U.S.C. § 4342.
22. *See* Exec. Order No. 11,991, 3 C.F.R., 1977 Comp., p. 123 (1977).
23. *See e.g.*, Mid State Coal. for Progress v. Surface Transp. Bd., 345 F.3d 520, 549 (8th Cir. 2003).
24. *See e.g.*, Marsh v. Or. Nat. Res. Council, 490 U.S. 360, 372 (1989).

B. The Social Cost of Carbon (SCC)

The Social Cost of Carbon (SCC) is the monetization of the total damage realized by emitting one metric ton of carbon dioxide into the atmosphere.[25] Thus, the SCC estimate is also an estimate of the pecuniary benefit of reducing carbon emissions.[26] The SCC "includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services."[27] To measure the SCC, analysts use integrated assessment models, through which analysts estimate future economic growth, population, and technological change, and define a baseline for current and future carbon emissions.[28] Then, typically one metric ton is added to the baseline projections and the models translate emissions into an increase in atmospheric carbon dioxide concentrations.[29] This increase in carbon concentrations results in an increase in global average temperature.[30] Then, the models translate the temperature change into physical impacts and monetized damages.[31] The models use discount rate percentages to convert the value of future costs and benefits into what they are worth today.[32] In each future year, the damages are reduced by the discount rate.[33] Thus, higher discount rates result in a lower SCC.[34]

25. Rennet et al., *supra* note 5.

26. *See id.*

27. INTERAGENCY WORKING GRP. (2021), *supra* note 6, at 2.

28. U.S. GOV'T ACCOUNTABILITY OFF., GAO-20-254, SOCIAL COST OF CARBON: IDENTIFYING A FEDERAL ENTITY TO ADDRESS THE NATIONAL ACADEMIES' RECOMMENDATIONS COULD STRENGTHEN REGULATORY ANALYSIS 10 (2020) [hereinafter GOV'T ACCOUNTABILITY OFF. (2020)].

29. *Id.*

30. *Id.*

31. *Id.*

32. *Id.* at 9.

33. GOV'T ACCOUNTABILITY OFF. (2020), *supra* note 28, at 11.

34. EPA, SCC, *supra* note 7, at 1–2.

To understand the effect that the discount rate has on present value calculations, consider the following example. Let's say that you have been promised that in 50 years you will receive $1 billion. In "present value" terms, that sum of money is worth $291 million today with a 2.5 percent discount rate. In other words, if you invested $291 million today at 2.5 percent and let it compound, it would be worth $1 billion in 50 years. A higher discount rate of 3 percent would decrease the value today to $228 million, and the value would be even lower—$87 million—with a 5 percent rate. This

II. THE PROBLEM: CURRENT NEPA REQUIREMENTS ARE INADEQUATE TO MEANINGFULLY ADDRESS ENVIRONMENTAL DAMAGE FROM CARBON EMISSIONS

While federal agencies are required to analyze the impacts of carbon emissions when preparing NEPA environmental assessments, agencies can meet this requirement simply through reference to the total resulting GHG emissions from a project.[35] However, this reporting mechanism is functionally meaningless because comparing total emissions does not enable analysis of the far-reaching societal impacts of different projects. It also enables arbitrary decision-making during the approval process for NEPA applications because there is no clear cap on emissions that are permitted to be released into the atmosphere from a federal action.[36]

For purposes of illustration, consider the Federal Aviation Administration's (FAA) LaGuardia Airport (LGA) Access Improvement Project. In order to "address unpredictable and increasing travel times to and from LGA, while also addressing space constraints for employee parking," the proposed action included the development of the following: an aboveground elevated fixed guideway Automated People Mover (APM) system connecting the Airport to the NYC Subway line and LIRR commuter rail; parking for the airport, APM, and MTA employees, and replacement Citi Field parking located at the Operations, Maintenance, and Storage Facility (OMSF); supporting utilities infrastructure; a new Consolidated Edison 27-kilovolt electrical industrial station located next to the OMSF; temporary and permanent easement on certain parcels to

> effect is even more pronounced when looking at the present value of damages further out in time. The value of $1 billion in 100 years is $85 million, $52 million, and $8 million, for discount rates of 2.5 percent, 3 percent, and 5 percent, respectively. Similarly, the selection of a 2.5 percent discount rate would result in higher SC-CO2 estimates than would the selection of 3 and 5 percent rates, all else equal.

Id. at 2.

35. *See* Border Power Plant Working Grp. v. Dept. of Energy, 260 F. Supp. 2d 997, 1028 (S.D. Cal. 2003); *see also* FED. AVIATION ADMIN., ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR LAGUARDIA AIRPORT ACCESS IMPROVEMENT PROJECT ES-4–ES-6 (2021).

36. *See* Memorandum from Christina Goldfuss, Council on Env't Quality, to Heads of Federal Departments & Agencies (Aug. 1, 2016), https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf; *see also* Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989); *Border Power Plant Working Grp.*, 260 F. Supp. 2d at 1028–29.

facilitate construction; and connected actions, such as MTA bus storage during construction of the OMSF, to allow construction.[37] The Executive Summary of the project's Environmental Impact Statement indicates that the LGA Access Improvement Project is a major federal action subject to the provisions of NEPA.[38]

In compliance with NEPA's requirement that the EIS analyze "any adverse environmental effects which cannot be avoided should the proposal be implemented," the LGA project's EIS considered the direct, indirect, and cumulative effects of the project's implementation.[39] Federal courts have held that NEPA requires agencies to engage in some analysis of the climate impacts of their actions.[40]

Accordingly, the EIS estimated the total annual GHG emissions in metric tons between 2021 and 2025, concluding that construction activities associated with the proposed LGA action would result in a "temporary increase in GHG emissions associated with construction equipment, delivery/haul truck trips, and construction worker commute trips."[41] The EIS emphasized that the proposed action would comprise a "very small fraction" of total GHG emissions in the United States and global emissions.[42] Additionally, the GHG emissions increase from construction activity would comprise about 0.07 percent of New York City emissions.[43] Based on the total estimated emissions in metric tons between 2021 and 2025, the EIS concluded that "construction of the Proposed Action is consistent with the most current CEQ guidance for disclosing GHG emissions and is not a significant contributor to climate change."[44] In arriving at this

37. FED. AVIATION ADMIN., *supra* note 35, at ES-4–ES-6.

38. *Id.* at ES-2.

39. *See id.* at 3-1; 42 U.S.C. § 4332(C)(ii) (2022). As defined in the CEQ's current NEPA implementing regulations, direct effects are those which are "caused by the action and occur at the same time and place." 40 C.F.R. § 1508.1(g)(1) (2022). Indirect effects are those which are "caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable . . . includ[ing] growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems." § 1508.1(g)(2).

40. *See, e.g.*, Ctr. For Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1216 (9th Cir. 2007).

41. FED. AVIATION ADMIN., *supra* note 35, at 3-53.

42. *Id.* at 3-53–3-54.

43. *Id.* at 3-54.

44. *Id.*

conclusion, the EIS also cited to the lack of a significance threshold imposed by FAA guidelines for climate impacts.[45] Based on the conclusion that the LGA proposed project would not have a substantial contribution to climate change, the EIS stated that the action would similarly not result in a substantial cumulative contribution to climate change.[46]

The LGA project's conclusion does not even marginally rely on the SCC.[47] And under CEQ guidance and federal court precedent, this was acceptable.[48] But in failing to include SCC analysis in the EIS, the effects of the project's implementation were expressed in fairly abstract terms. The quantification of GHG emissions in metric tons does not encompass the impacts those emissions will have on "all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services."[49] This is the very value the SCC calculates. The SCC is the path forward for genuinely understanding the comprehensive environmental impacts of federal projects, and consequently making informed decisions about proposal implementation.

Thus, the SCC should be a reporting requirement for NEPA EIS. This will create a more consistent mechanism to evaluate the carbon-related impacts of alternative federal projects. A consistent framework will also likely lead to less litigation, as it removes a discretionary aspect from the NEPA approval process. Requiring SCC analysis will also establish a clearer measure of the impacts of alternative projects that the public can comprehend and respond to meaningfully during the comment period for EIS. As Stanford University economist, Lawrence Goulder, explains, the SCC "provides the key information societies need to determine how much to sacrifice to combat climate

45. *Id.*

46. FED. AVIATION ADMIN., *supra* note 35, at 3-58.

47. For another example of an Environmental Impact Statement that fails to consider the SCC, see, e.g., N.Y. DEP'T OF TRANSP., I-81 VIADUCT PROJECT FINAL DESIGN REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT, at § 6-4-5 (2022), https://static.parsons.com/I-81-FEIS/04-2022.

48. Exec. Order No. 13,990, 86 Fed. Reg. 7,037 (Jan. 20, 2021). It must be noted that following *Vecinos* (which was decided after the LGA EIS was issued), federal agencies might be required to include an explanation as to why the SCC was not used in an EIS. *See* Vecinos para el Bienestar de la Comunidad Costera v. Fed. Energy Regul, Comm'n., 6 F.4th 1321, 1329–30 (D.C. Cir. 2021).

49. INTERAGENCY WORKING GRP. (2021), *supra* note 6, at 2.

change. That's because the social cost of carbon is the benefit—that is, the avoided damage—from reducing emissions of CO_2."[50]

Additionally, calculating the impacts of a federal project's carbon emissions as a dollar value might help to justify spending more for a carbon-conscious alternative where another alternative is environmentally "costly." Without clear monetization of the environmental damages resulting from carbon emissions, it is extremely difficult to understand the present and future environmental costs of projects. Therefore, effective balancing of costs in not occurring.

III. THE SCC'S INSECURE HISTORY: POLITICAL AND LEGAL FLUCTUATION IN SUPPORT FOR UTILIZATION OF THE SCC

A. The SCC and its Political Rollercoaster

1. Origin: The Bush Administration

In 2008, one court decision set the stage for future standardization of the SCC in federal agency analyses.[51] In *Center for Biological Diversity v. National Highway Traffic Safety Administration*, the Ninth Circuit remanded a fuel economy rule to the Department of Transportation (DOT) because the National Highway Traffic Safety Administration failed to consider the value of reducing carbon dioxide emissions.[52] The Ninth Circuit stated, "while the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero."[53] As a result of this case, the Department of Energy (DOE), DOT, and the Environmental Protection Agency (EPA) used academic literature to incorporate individually developed estimates of the SCC into regulatory analyses.[54] The estimates ranged from $0 to $159 (in 2006, 2007, or 2008 dollars) per metric ton of carbon emitted in 2007.[55]

50. Isabella Backman, *Stanford Explainer: Social Cost of Carbon*, STANFORD NEWS (June 7, 2021), https://news.stanford.edu/2021/06/07/professors-explain-social-cost-carbon/.

51. *See* INTERAGENCY WORKING GRP. (2021), *supra* note 6, at 2.

52. *See* Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1203 (9th Cir. 2008).

53. *Id.* at 1200.

54. GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 5.

55. *Id.*

2. Standardization: The Obama Administration

A. Development of the Federal SCC

To solve inconsistencies among agencies, in early 2009, the Office of Management and Budget (OMB) and Council of Economic Advisers under President Obama created the Interagency Working Group (IWG) on Social Cost of Carbon.[56] The IWG was convened under Executive Order 12,866, which directed agencies to assess the costs and benefits of significant regulatory actions.[57] The IWG members represented six offices of the Executive Office of the President (EOP) and six federal agencies.[58] EOP Offices included: Council of Economic Advisers; CEQ; National Economic Council; Office of Energy and Climate Change; OMB/Office of Information and Regulatory Affairs; and Office of Science and Technology Policy.[59] Federal agencies included: Department of Agriculture; Department of Commerce; DOE; DOT; Department of the Treasury; and EPA.[60]

The IWG used academic literature to create interim estimates for the SCC, which first appeared in the DOE's final rule on energy standards for vending machines.[61] Agencies then incorporated the interim estimates into regulatory actions that sought public comments for the purpose of developing final estimates.[62] The middle value for the range of interim estimates was nineteen dollars (2006 dollars) per metric ton of carbon dioxide emitted in 2007.[63] In October 2009, the IWG issued final SCC estimates in the Technical Support Document, which was released publicly in March 2010 as an appendix to the DOE's final rule on energy standards for small electric motors.[64]

To finalize the estimates, the IWG "(1) used consensus-based decision making; (2) relied largely on existing academic literature and models, including technical assistance from outside resources; and (3) took steps to disclose limitations and incorporate new information by

56. *Id.* at 6.

57. *Id.* at 8; *see also* Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Sept. 30, 1993).

58. GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 8.

59. *Id.* at 9.

60. *Id.*

61. *Id.* at 6.

62. *Id.*

63. GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 6.

64. *Id.*

considering public comments and revising the estimates as updated research became available."[65]

First, participants informed the Government Accountability Office (GAO) that the IWG's decision-making process was open and collegial.[66]

Second, the final IWG estimates derive from three models that integrate climate and economic data to predict future economic effects resulting from climate change.[67] The three models include Dynamic Integrated Climate and Economy (DICE), Climate Framework for Uncertainty, Negotiation, and Distribution (FUND), and Policy Analysis of the Greenhouse Effect (PAGE).[68] These models were used by the United Nations' Intergovernmental Panel on Climate Change, and recognized as widely used by the National Research Council of the National Academies.[69] Relying upon knowledge of the academic literature, the IWG decided on three estimates for discount rates (2.5, 3, and 5 percent) because no consensus existed as to the appropriate rate.[70]

Third, the IWG recognized the limitations of its estimates.[71] For instance, in the Technical Support Document, the IWG disclosed that none of the models considered damages from wildlife loss or ocean acidification caused by carbon dioxide emissions.[72] The models also did not account for how technology adapted to warmer temperatures, or the effects of damages due to catastrophic events such as Antarctic ice sheet melts.[73] As such, the Technical Support Document suggested that the models might underestimate carbon-related damages.[74] The Technical Support Document also stated that the IWG would update the estimates based on new scientific and economic research.[75]

65. *Id.* at 8.
66. *Id.* at 12.
67. *Id.* at 13.
68. GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 13 n.24.
69. *Id.* at 13.
70. *Id.* at 15.
71. *Id.* at 17.
72. *See* INTERAGENCY WORKING GRP. ON SOC. COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866, at 29. (2010), https://www.epa.gov/sites/default/files/2016-12/documents/scc_tsd_2010.pdf [hereinafter INTERAGENCY WORKING GRP. (2010)].
73. *See id.*
74. *Id.* at 31.
75. *Id.* at 3.

Additionally, since the IWG estimates were produced, numerous regulatory actions utilizing the estimates were published and opened for public comment.[76] Accordingly, the IWG revised the estimates for the first time in 2013 upon suggestions in public comments informing the IWG that the models the 2010 estimates were based on had been updated.[77]

The IWG selected four SCC values for use in regulatory analyses, with the central value as the average SCC across models at the three percent discount rate.[78] The 2010 estimates were subsequently updated in 2013 and 2016 to reflect new versions of integrated assessment models, and to reflect recommendations in the interim report of the National Academies of Sciences, Engineering, and Medicine.[79] The 2010, 2013, and 2016 estimates for 2010, 2020, and 2030 are reflected in the below table[80]:

76. *See* GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 18.

77. *Id.*

78. INTERAGENCY WORKING GRP. (2010), *supra* note 72, at 3.

79. *See* INTERAGENCY WORKING GRP. ON SOC. COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 2 (2013), https://www.govinfo.gov/content/pkg/FR-2013-11-26/pdf/2013-28242.pdf [hereinafter INTERAGENCY WORKING GRP. (2013)]; *see also* INTERAGENCY WORKING GRP. ON SOC. COST OF GREENHOUSE GASES, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866, at 2 (2016), https://www.epa.gov/sites/default/files/2016-12/documents/sc_co2_tsd_august_2016.pdf [hereinafter INTERAGENCY WORKING GRP. (2016)].

80. The estimates are in 2007 dollars.

Table 1

	Emissions Year	**2.5% Discount Rate**	**3% Discount Rate**	**5% Discount Rate**	**3% Discount Rate (95th Percentile**)**
2010 Estimates[81]	2010	$35.1*	$21.4	$4.7	$64.9
	2020	41.7	26.3	6.8	80.7
	2030	50.0	32.8	9.7	100.0
2013 Updates[82]	2010	51	32	11	89
	2020	64	43	12	128
	2030	75	52	16	159
2016 Updates[83]	2010	50	31	10	86
	2020	62	42	12	123
	2030	73	50	16	152

* This value represents the SCC per metric ton.

** This represents the 95th percentile SCC across all three models at a discount rate of 3%.

It must be acknowledged that some leading environmental scholars question the adequacy of Social Cost of Carbon estimates.[84] For instance, David Driesen argues that SCC values are too uncertain, stating, "each of these models [DICE, PAGE, and FUND] relies on assumptions about the extent of climate damages and/or the ease of adaptation which serve to minimize the threat of climate change."[85] Driesen suggests that one of the most egregious limitations of the SCC

81. INTERAGENCY WORKING GRP. (2010), *supra* note 72, at 1.

82. INTERAGENCY WORKING GRP. (2013), *supra* note 79, at 3.

83. INTERAGENCY WORKING GRP. (2016), *supra* note 79, at 4.

84. *See* Jonathan Masur & Eric A. Posner, *Climate Regulation and the Limits of Cost-Benefit Analysis*, 99 CALIF. L. REV. 1557, 1577–96 (2011); *see also* David M. Driesen, *Cost-Benefit Analysis and the Precautionary Principle: Can They Be Reconciled?*, 2013 MICH. ST. L. REV. 771, 806 (2013).

85. Driesen, *supra* note 84, at 806.

is its inability to account for catastrophic risk because so little is known about the "risks of disastrously high climate sensitivity."[86] Although the nature of measuring carbon emissions will innately be imperfect, useful tools that already exist (like SCC valuation) should be improved upon and utilized as climate science enhances. Simultaneously, the models' weaknesses should be publicized for full transparency.

B. The SCC and NEPA Analysis

In 2016, the CEQ released its "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environment Policy Act Reviews," stating that where monetary cost-benefit analyses are permitted under NEPA, the federal SCC "provides a harmonized, interagency metric that can give decision makers and the public useful information for their NEPA review."[87] Thus, the 2016 CEQ guidance supported use of the SCC in NEPA assessments, but did not require it.[88]

3. Minimization: The Trump Administration

The SCC was minimized from the outset of the Trump Administration. Shortly after President Trump's election, the newly appointed CEQ members withdrew the 2016 guidance, which supported utilization of the SCC in NEPA assessments.[89] In addition, in January 2017, the National Academies of Sciences, Engineering, and Medicine recommended updating the methodologies used to estimate the SCC to ensure the estimates reflected best available science, improving characterization of uncertainty, and enhancing transparency of the IWG's estimation framework.[90] But in March 2017, President Trump issued Executive Order 13,783, which disbanded the IWG and withdrew its Technical Support Documents and updates, including the Obama Administration's estimates for the SCC.[91] The IWG and its support documents were withdrawn as "no

86. *Id.*

87. Goldfuss, *supra* note 36.

88. *See id.*

89. Jayni Foley Hein & Natalie Jacewicz, *Implementing NEPA in the Age of Climate Change*, 10 MICH. J. ENV'T & ADMIN. L. 1, 15 (2020).

90. *See* GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 13–14.

91. *See* Exec. Order No. 13,783, 82 Fed. Reg. 16093 (Mar. 28, 2017).

longer representative of governmental policy."[92] The Executive Order subsequently directed that monetary estimates for carbon dioxide and any other greenhouse gases be consistent with guidance in OMB Circular A-4.[93]

Circular A-4 was issued in 2003 by OMB, providing guidance to federal agencies for conducting regulatory analyses of the costs and benefits of federal regulations.[94] Circular A-4 provides guidance for systematic cost-benefit evaluation, including monetization when applicable.[95] It also emphasizes that the cost-benefit analyses be based on the best available scientific, technical, and economic information.[96] Accordingly, Executive Order 13,783 supplemented Executive Order 12,866.[97] Circular A-4 states that analyses of federal regulatory impact should be limited in scope to domestic impacts, but that further analysis may be necessary.[98] Significantly, it also states that agencies should use discount rates between three and seven percent when monetizing costs and benefits.[99] As such, the Trump Administration EPA's SCC estimates for 2015, 2020, 2030, and 2040 are reflected in the table below[100]:

Table 2

	Emissions Year	**3% Discount Rate**	**7% Discount Rate**
2017 Interim Estimates[101]	2015	$5	$1
	2020	6	1
	2030	7	1

92. *Id.*

93. *Id.*

94. *See* GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 4; *see also* OFF. OF MGMT. & BUDGET, CIRCULAR A-4 1 (2003) (available at https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A4/a-4.pdf).

95. *See* GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 4*; see also* OFF. OF MGMT. & BUDGET, *supra* note 94, at 1–2.

96. *See* GOV'T ACCOUNTABILITY OFF. (2014), *supra* note 4, at 5.

97. *Id.*

98. *See id.* at 6 n.14.

99. *See* OFF. OF MGMT. & BUDGET, *supra* note 94, at 33.

100. *See* ENV'T PROT. AGENCY, REGULATORY IMPACT ANALYSIS FOR THE REV. OF THE CLEAN POWER PLAN: PROPOSAL 44 (2017).

101. These estimates are in 2011 dollars. *Id.*

	2040	9	2

The Trump Administration utilized the same economic models as the IWG to create SCC estimates, but Executive Order 13,783 changed two key assumptions of the IWG estimates, forcing the SCC much lower than prior years.[102] The Trump Administration used "(1) domestic rather than global climate change damages…and (2) different discount rates (3 and 7 percent rather than 2.5, 3, and 5 percent)."[103] The Trump Administration ignored the recommendations of the National Academies for updating methodologies for the SCC, including information that the estimates used by federal agencies were based on integrated assessment models that did not incorporate the latest research.[104] While OMB monitored research, neither OMB nor other agencies expressed plans to take responsibility for the National Academies' Recommendations.[105]

As mentioned, CEQ withdrew its 2016 guidance shortly after President Trump was elected.[106] Then, in June 2019, CEQ established new draft guidance, allowing qualitative analysis of GHG emissions when "an agency determines that the tools, methods, or data inputs necessary to quantify a proposed action's GHG emissions are not reasonably available," or otherwise impracticable.[107] Agencies were also given flexibility to not quantify GHG emissions when the information necessary to do so was unavailable, or the complexity of identifying emissions would make the quantification too speculative.[108] The 2019 draft guidance also stated that "the SCC estimates were developed for rulemaking purposes to assist agencies

102. GOV'T ACCOUNTABILITY OFF. (2020), *supra* note 28, at 4–5.

103. GOV'T ACCOUNTABILITY OFF. (2020), *supra* note 28. Contrary to the guidance of Executive Order 13,783, the IWG Technical Support Documents concluded that the SCC should be based on global climate damages because emissions of carbon dioxide have global impacts, and climate change cannot be solved by the United States alone. *See* INTERAGENCY WORKING GRP. (2010), *supra* note 72, at 10–11.

104. *See* GOV'T ACCOUNTABILITY OFF. (2020), *supra* note 28, at 24; *see also Assessing Approaches to Updating the Social Cost of Carbon*, NAT'L ACADS., https://www.nationalacademies.org/our-work/assessing-approaches-to-updating-the-social-cost-of-carbon (last visited Nov. 17, 2022).

105. *See* GOV'T ACCOUNTABILITY OFF. (2020), *supra* note 28, at 24.

106. Hein & Jacewicz, *supra* note 89, at 15.

107. Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions, 84 Fed. Reg. 30,097–98 (Jun. 26, 2019).

108. *Id.*

in evaluating the costs and benefits of regulatory actions, and were not intended for socio-economic analysis under NEPA."[109] As such, the guidance went further than stating that NEPA does not require monetary cost-benefit analyses, impliedly discouraging such analysis.[110]

4. The Comeback?: The Biden Administration

The Biden Administration has reinvigorated the utility of the SCC. Executive Order 13,990 states 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."[111] In order to fulfill this objective, the Executive Order established the IWG on the Social Cost of Greenhouse Gases and directed the IWG to publish an interim SCC, Social Cost of Nitrous Oxide (SCN), and Social Cost of Methane (SCM) within thirty days, and final estimates by January 2022.[112] The Executive Order states that the agencies "shall use" the interim estimates "when monetizing the value of changes in greenhouse gas emissions resulting from regulations and other relevant agency actions until final values are published."[113] In formulating estimates, the Order also directs the IWG to utilize the 2017 recommendations of the National Academies of Science, Engineering, and Medicine, additional scientific literature, public comments, and advice of ethics experts.[114] It also directs the IWG to "ensure that the SCC, SCN, and SCM reflect the interests of future generations in avoiding threats posed by climate change."[115]

In accordance with Executive Order 13,990, the IWG released a Technical Support Document with interim estimates for the Social Cost of Carbon, Methane, and Nitrous Oxide in February 2021.[116] The Technical Support Document declares that the interim values are "the same as those developed by the IWG in 2013 and 2016."[117] The 2021 SCC interim estimates for 2020, 2030, and 2040 are reflected in the table below[118]:

109. 84 Fed. Reg. at 30,099.
110. *See id.*
111. Exec. Order No. 13,990, 86 Fed. Reg. 7,037, 7,040 (Jan. 20, 2021).
112. *See id.* The final estimates were not released.
113. *Id.*
114. *Id*. at 7041.
115. *Id.*
116. *See* INTERAGENCY WORKING GRP. (2021), *supra* note 6.
117. *Id.* at 1.
118. *Id*. at 5. These estimates are in 2020 dollars.

Table 3

	Emissions Year	**2.5% Discount Rate**	**3% Discount Rate**	**5% Discount Rate**	**3% Discount Rate (95th Percentile**)**
2021 Interim Estimates[119]	2020	$76*	$51	$14	$152
	2030	89	62	19	187
	2040	103	73	25	225

* This represents the SCC per metric ton.

** This represents the 95th percentile SCC across all three models at a discount rate of 3%.

In addition to IWG action, CEQ rescinded its 2019 Draft NEPA Guidance on Consideration of Greenhouse Gas Emissions and is currently reviewing the 2016 Final Guidance for revision and update.[120]

The reestablishment of Obama era SCC estimates indicates a return to the perspective that the SCC is a meaningful tool to assess the environmental impacts of climate change. The Order's language that agencies "shall use" the interim estimates when monetizing the value of GHG emission changes "resulting from regulations and other relevant agency actions" suggests that the SCC is not only a meaningful tool in the rulemaking context, in which cost-benefit analysis is required, but also in project-level NEPA reviews.[121]

However, President Biden's Executive Order 13,990 has faced serious opposition. On April 22, 2021, the States of Louisiana, Alabama, Florida, Georgia, Kentucky, Mississippi, South Dakota, West Virginia, and Wyoming collectively filed a complaint against President Biden and numerous other federal government defendants seeking injunctive and declaratory relief relating to the interim

119. *Id.*

120. *See Guidance on Consideration of Greenhouse Gases*, COUNCIL ON ENV'T QUALITY, https://ceq.doe.gov/guidance/ceq_guidance_nepa-ghg.html (last visited Nov. 17, 2022).

121. Exec. Order No. 13,990, 86 Fed. Reg. 7,037, 7,040 (Jan. 20, 2021).

estimates.[122] The United States District Court for the Western District of Louisiana granted the States' motion for preliminary injunction.[123] It held that the interim estimates were not promulgated in compliance with the Administrative Procedure Act (APA) because the estimates were issued without required notice and comment procedures.[124] Also, accepting the States' argument that the interim estimates would increase regulatory stringency and thus impose significant costs to state economies, the district court held that Executive Order 13,990 violates the major questions doctrine because "the President lacks power to promulgate fundamentally transformative legislative rules in areas of vast political, social, and economic importance."[125] The district court also explained that because the interim estimates consider global instead of domestic damages, "Executive Order 13990 contradicts Congress' intent regarding legislative rulemaking by mandating consideration of the global effects."[126]

The Western District's decision functionally immobilized work on the SCC, pending appeal.[127] However, the Fifth Circuit granted the U.S. Government's motion to stay the injunction pending appeal, holding that the "Government Defendants are likely to succeed on the merits because the Plaintiff States lack standing."[128] The Fifth Circuit explained that the Plaintiffs' claim that they will face "increased regulatory burdens" is hypothetical, and thus does not meet standing requirements for injury.[129] The Supreme Court then confirmed this position by rejecting the Plaintiff States' request to vacate the Fifth

122. *See* Louisiana v. Biden, No. 2:21-CV-01074, 2022 U.S. Dist. LEXIS 25496, at *4 (W.D. La. Feb. 11, 2022).

123. *Id.* at *55.

124. *Id.* at *44 (citing Cath. Health Initiatives v. Sebelius, 617 F.3d 490, 495 (D.C. Cir. 2010) ("When an agency wants to state a principle 'in numerical terms,' terms that cannot be derived from a particular record, the agency is legislating and should act through rulemaking.")).

125. *Id.* at *42.

126. *Id.*

127. *See* Ariana de Vogue & Ella Nilsen, *Supreme Court Allows Biden Administration to Continue Counting the Costs of Planet-Warming Emissions, For Now*, CNN (May 26, 2022, 4:52 PM), https://www.cnn.com/2022/05/26/politics/supreme-court-social-cost-of-carbon-ruling-climate/index.html.

128. State v. Biden, No. 22-30087, 2022 U.S. App. LEXIS 7589, at *8 (5th Cir. Mar. 16, 2022).

129. *Id.*

Circuit stay.[130] In *Missouri v. Biden*, the Eighth Circuit similarly dismissed a complaint against the interim estimates, holding that Missouri and twelve other states lacked standing.[131] The Eighth Circuit concluded that it lacked the authority to review the claim absent specific agency action based on the estimates.[132]

The implications of *Louisiana v. Biden* and *Missouri v. Biden* remain unclear. While the Supreme Court rejected the Plaintiff States' argument to vacate the stay in *Louisiana v. Biden*, this judgment was not a substantive acceptance of the process whereby the IWG creates and enforces SCC estimates.[133] And importantly, the Court's recent decision in *West Virginia v. EPA* demonstrates a willingness to accept arguments against executive action under the major questions doctrine.[134] The extent of the doctrine's resulting invocation is unpredictable. But taken together, *West Virginia v. EPA* and the Western District's ruling in *Louisiana v. Biden* are warnings that issuing and executively enforcing IWG estimates that consider global impacts will likely be procedurally inadequate to require use of a certain SCC value.

B. The Legal Landscape of the SCC

When analyzing the environmental impacts of projects, NEPA's regulated entities are not required to perform cost-benefit analyses.[135] In fact, Section 1502.23 of NEPA's implementing regulations states that monetary cost-benefit analyses are not required to assess alternative projects, and should not be when important qualitative considerations exist.[136] However, when an agency determines that monetization of the effects of climate change is appropriate and

130. *See* SUP. CT., ORDER IN PENDING CASE (May 26, 2022) (available at https://www.supremecourt.gov/orders/courtorders/052622zr_4315.pdf) [hereinafter SUP. CT., ORDER] (order vacating stay denied by Justice Alito); *see also* Amy Howe, *Justices Decline to Block Biden Policy on Social Costs of Greenhouse Gases*, SCOTUSBLOG (May 26, 2022, 2:59 PM), https://www.scotusblog.com/2022/05/justices-decline-to-block-biden-policy-on-social-costs-of-greenhouse-gases/.

131. *See* Missouri v. Biden, 52 F.4th 362, 366 (8th Cir. Oct. 21, 2022).

132. *See id.* at 366, 372.

133. *See* SUP. CT., ORDER, *supra* note 130.

134. *See* W. Va. v. Env't Prot. Agency, 142 S. Ct. 2587, 2614 (2022).

135. *See* 40 C.F.R. § 1502.23 (2022).

136. *See id.*

relevant to balance alternative federal actions, the door remains open to utilizing the SCC as an analytical tool.[137]

As the previous section demonstrates, establishing and requiring a particular SCC value remains a contentious, politicized issue. Regardless, courts have generally supported use of the SCC to fulfill the mandatory requirement that agencies analyze carbon emissions under NEPA.[138]

1. General Judicial Support for Using the SCC to Analyze Carbon Emissions under NEPA

Some courts have been unwilling to accept the argument that quantification of the effects of greenhouse gas emissions is too difficult. For instance, in *High Country Conservation Advocates v. United States Forest Service*, defendants argued that predicting the environmental impact of GHGs on global climate change was not possible.[139] But the United States District Court for the District of Colorado pushed back, stating that the SCC was an available tool.[140] The court declared that although NEPA does not require cost-benefit analyses, it was arbitrary and capricious for defendants to include evidence of the benefits of disputed lease modifications, but exclude the costs when the costs were originally included in the draft EIS.[141] The court acknowledged that the SCC was created to assist agencies in cost-benefit analyses related to rulemaking, but clarified that the "EPA has expressed support for its use in other contexts."[142]

137. *See id.*; *see also* Goldfuss, *supra* note 36, at 32–33.

138. *See e.g.*, High Country Conservation Advocs. v. U.S. Forest Serv., 52 F. Supp. 3d 1174**,** 1190 (D. Colo. 2014); *see also* Border Power Plant Working Grp. v. Dep't of Energy, 260 F. Supp. 2d 997, 1028–29 (S.D. Cal. 2003) (holding that because carbon dioxide emissions have potential environmental impacts, the failure to disclose carbon dioxide emissions was counter to NEPA); *see also* Ctr. For Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1216–17 (9th Cir. 2008) (finding the NHTSA's Environmental Assessment for setting CAFÉ standards inadequate because although the assessment quantified the expected carbon emissions from light trucks MYs 2005-2011, it failed to evaluate the incremental impact the emissions would have on climate change or the environment more generally in context with past, present, and reasonably foreseeable actions) ("The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.").

139. *High Country Conservation Advocs.*, 52 F. Supp. 3d at 1190.

140. *Id.*

141. *Id.* at 1191.

142. *Id.* at 1190.

2. Courts Have Not Explicitly Required Use of the SCC

The *High Country* decision did not signify a lasting victory for the SCC in the courts. In *League of Wilderness Defenders/Blue Mountain Diversity Project v. Connaughton*, the United States District Court for the District of Oregon did not require the Forest Service to provide a quantitative analysis of the cost of their project in relation to climate change.[143] The court differentiated the case from *High Country*, concluding that because the Forest Service did not rely on qualitative analyses of the costs or benefits of the project, and because there was no clear science enabling the Forest Service to do so, there was no selective omission of such data like in *High Country*.[144]

SCC analysis was also not required in *EarthReports, Inc. v. Federal Energy Regulatory Commission*. In *EarthReports*, the D.C. Circuit held that Federal Energy Regulatory Commission (FERC) did not need to use the SCC to measure the environmental impacts of converting a liquefied natural gas facility from an import maritime terminal to a mixed-use terminal.[145] The court accepted FERC's argument that the SCC was not required in the NEPA analysis because of (1) uncertainties surrounding discount rates; (2) inability of the SCC to measure incremental impacts of projects on the environment; and (3) the lack of established criteria as to what monetary values would be considered significant for NEPA purposes.[146] Oddly, *EarthReports* was decided three weeks before the D.C. Circuit upheld the use of the SCC in cost-benefit analyses based on reasoning diametrically opposed to the court's reasoning in *Earth Reports*.[147]

The D.C. Circuit's analysis in *Sierra Club v. Federal Energy Regulatory Commission* was similar to *EarthReports*.[148] In *Sierra Club*, the court required FERC to provide either a quantitative estimate of downstream greenhouse emissions or a satisfactory explanation as

143. *See* League of Wilderness Defs./Blue Mountains Biodiversity Project v. Connaughton, No. 3:12-cv-02271-HZ, 2014 U.S. Dist. LEXIS 170072, at *72 (D. Or. Dec. 9, 2014).

144. *See id.* at *72–73.

145. EarthReports, Inc. v. Fed. Energy Regul. Comm'n, 828 F.3d 949, 956 (D.C. Cir. 2016).

146. *See id.*

147. *See* Zero Zone, Inc. v. Dep't of Energy, 832 F.3d 654, 677 (7th Cir. 2016); *see also* Anthony R. Raduazo, Note, *The CO[2] Monetization Gap: Integrating the Social Cost of Carbon into NEPA*, 118 COLUM. L. REV. 605, 623–24 (2018).

148. *See* Sierra Club v. Fed. Energy Regul. Comm'n, 867 F.3d 1357 (D.C. Cir. 2017).

to why such an analysis would be implausible.[149] Although the court allowed an escape route from incorporating the SCC and other quantitative methods, it still expressed support for quantification, stating:

> Quantification would permit the agency to compare the emissions from this project to emissions from other projects, to total emissions from the state or the region, or to regional or national emissions-control goals. Without such comparisons, it is difficult to see how FERC could engage in "informed decision making" with respect to the greenhouse-gas effects of this project, or how "informed public comment" could be possible.[150]

3. A Recent D.C. Circuit Case Required Explanation for Failure to Use the SCC in Narrow Circumstance

Quantifying the effects of climate change on a community is admittedly a complicated task. But Section 1502.21 of the Code of Federal Regulations provides guidance for situations where relevant information is difficult to obtain.[151] Section 1502.21 states that if the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained due to unreasonable costs or unknown means of obtaining the information, Environmental Impact Statements should include the agency's evaluation "based upon theoretical approaches or research methods generally accepted in the scientific community."[152]

In the recent case, *Vecinos para el Bienestar de la Comunidad Costera v. Federal Energy Regulatory Commission*, the D.C. Circuit held that FERC was required to explain whether Section 1502.21(c) of the Code of Federal Regulations required FERC to apply the SCC or another analytical framework as "'generally accepted in the scientific community' within the meaning of the regulation, and if not, why not."[153] In *Vecinos*, FERC argued the same three reasons for not using the SCC as it did in *EarthReports*: (1) no consensus exists as to an appropriate discount rate; (2) that the SCC provides a monetary estimate but does not measure the actual incremental environmental

149. *See id.* at 1374.

150. *Id.*

151. *See* 40 C.F.R. § 1502.21(c) (2022).

152. § 1502.21(c)(4).

153. Vecinos para el Bienestar de la Comunidad Costera v. Fed. Energy Regul. Comm'n, 6 F.4th 1321, 1330 (D.C. Cir. 2021).

impacts of a project; and (3) that there are no criteria for evaluating whether a monetary cost is "significant."[154]

However, the court distinguished this case from *EarthReports* because here, petitioners specifically implicated Section 1501.21(c), arguing that FERC failed to comply with the regulation by not using the SCC or another generally accepted method to assess GHG emissions.[155] The court stated that the *EarthReports* decision "did not address the significance of that regulation to the Commission's refusal to use the social cost of carbon protocol."[156] While the D.C. Circuit refused to hold that FERC was required to use the SCC or another analytical framework, its holding required FERC to explain why it did not do so under Section 1502.21(c).[157] This indicates a potentially revolutionary recognition of the influence of the SCC.

In cases regarding the relationship between the SCC and NEPA, the courts have consistently refused to explicitly require SCC analysis in EIS, but many courts have still acknowledged the benefits of monetary quantification.[158] Plus, advances in climate science, along with the proposals in the following section, may alleviate apprehensions surrounding the controversial nature of the SCC.

IV. RECOMMENDATIONS

To effectuate a more predictable, meaningful, and comprehensive approval process for actions implicating NEPA, three crucial steps must be taken. First, the SCC must be stabilized to reduce high levels of executive discretion on a calculation that should be based on scientific analysis. Second, NEPA should require federal agencies to consider the SCC in EIS. Third, in order for cost-of-carbon analysis to be meaningful, there should be an absolute SCC cap for NEPA projects.

A. The Methods for Determining SCC Values Should be Stabilized

First, the SCC must be stabilized, and it is vital that this step occurs before the SCC is a required analysis in NEPA EIS. For purposes of this discussion, stabilization refers to agreeing upon a

154. *See id.* at 1328.

155. *See id.* at 1329.

156. *Id.*

157. *Id.* at 1330.

158. *See Vecinos*, 6 F.4th at 1330; EarthReports, Inc. v. Fed. Energy Regul. Comm'n, 828 F.3d 949, 956 (D.C. Cir. 2016); Sierra Club v. Fed. Energy Regul. Comm'n, 867 F.3d 1357, 1374 (D.C. Cir. 2017).

constant method for determining SCC values over time. As discussed in Part III(A), the value of the SCC has changed drastically from administration to administration.[159] The Trump Administration estimates for the SCC were far lower than the Obama Administration estimates and Biden Administration interim estimates because the Trump era SCC was based off of "(1) domestic rather than global climate change damages…and (2) different discount rates (3 and 7 percent rather than 2.5, 3, and 5 percent)."[160]

Aside from disagreements over discount rates and the scope of emission damages, criticism also exists as to the SCC's failure to account for the possibility of extreme climate-related catastrophes.[161] For instance, the future is uncertain as to whether large ice sheets in Greenland and West Antarctica will melt, and whether "vast deposits of frozen methane and permafrost" will thaw.[162] Thus, some economists argue that current economic models, such as the SCC model, do not account for nonmarginal changes.[163] William Nordhaus, recipient of the 2018 Nobel Memorial Prize in Economic Sciences, refers to the unknown possibilities in climate change impacts as the roulette wheel in a Climate Casino.[164] To account for extreme future events in economic models, he suggests, "[a] sensible strategy would suggest an insurance premium to avoid the roulette wheel in the Climate Casino. We should add a premium in our damages estimates to reflect the casino risks on top of the identified damages."[165]

While it is widely accepted that policies change when a new administration takes control, a value as scientifically grounded as the SCC should not be subject to a political seesaw. Therefore, a bipartisan Social Cost of Carbon Working Group, with equal representation from the Democratic and Republican parties, should be appointed to settle on the SCC and its discount rates based on a cautious and complete analysis of all relevant scientific data. In preparing the SCC values, the Working Group should open its preliminary values to a notice and

159. *See supra* Part III(A).

160. *See* U.S. GOV'T ACCOUNTABILITY OFF. (2020), *supra* note 28.

161. *See* WILLIAM NORDHAUS, THE CLIMATE CASINO: RISK, UNCERTAINTY, AND ECONOMICS FOR A WARMING WORLD 141–42 (2013).

162. *Id.* at 141.

163. *See id.*; *see also* CONG. RSCH. SERV., ATTACHING A PRICE TO GREENHOUSE GAS EMISSIONS WITH A CARBON TAX OR EMISSIONS FEE: CONSIDERATIONS AND POTENTIAL IMPACTS 8 (2019), https://crsreports.congress.gov/product/pdf/R/R45625.

164. *See* NORDHAUS, *supra* note 161, at 141.

165. *Id.* at 142.

comment period.[166] Only after consideration of all current research and comments, it should determine final SCC values.[167]

Stabilizing SCC values is admittedly an ambitious undertaking because of the fundamental disagreements regarding the territorial scope of climate damages that should be considered, and discount rates that should apply. It will be vital for the group to closely follow scientific developments, and to consider the extent of criticism against the SCC estimates established by both the Democratic and Republican parties. If the Working Group cannot reach an agreement on the methods for determining the SCC, the SCC values will likely continue to fluctuate uncontrollably with the entrance of new administrations. Effective comparisons of the environmental impacts of federal projects cannot be made if one day, the SCC is seven dollars per metric ton at a three percent discount rate, and the next day, the SCC is sixty-two dollars per metric ton. Such drastic instability renders the SCC confusing and functionally meaningless. Of course, the bipartisan group must be permitted to collaboratively adjust the value of the SCC as new research regarding the SCC arises. Precisely how compromises might be made to agree upon a method to determine SCC values is beyond the scope of this Note, but where possible, a bipartisan settlement to develop more constant SCC values based on best available science should be a primary goal.

B. The SCC Should be a Reporting Requirement in NEPA EIS

After the bipartisan Working Group has settled the SCC values, federal agencies should be required to consider the SCC of each alternative project proposed within their EIS. If the SCC valuation process is stabilized through bipartisan action as recommended above, there will likely be less controversy over its use. Requiring the stabilized SCC in EIS will remove a level of arbitrariness inherent in determining whether agencies adequately considered GHG emissions resulting from projects. Removing ambiguity as to what is expected of federal agencies when assessing GHG emission effects will likely cause a natural decline in litigation.[168]

Without mandating SCC analysis, agencies might inflate the economic benefits of projects by emphasizing monetary advantages, while no similar comparison with the affirmative value of the project's

166. *See* Louisiana v. Biden, No. 2:21-CV-01074, 2022 U.S. Dist. LEXIS 25496, at *43 (W.D. La. Feb. 11, 2022).

167. *See id.*

168. *See* Hein & Jacewicz, *supra* note 89, at 18.

environmental toll occurs.[169] The current system thus permits decision-makers to approve NEPA projects without meaningfully balancing all relevant factors.[170] Also, requiring use of the SCC will enable agencies and the public to compare the environmental impacts of alternative projects with ease. Instead of measuring total emissions and trying to gauge how the GHG emissions would materialize as damages, the SCC will boil the environmental costs down to a workable number.

If the new bipartisan SCC Working Group's values incorporate any global climate impacts, requiring use of the SCC in NEPA project reviews should be accomplished through legislation that explicitly accepts the Working Group's methods for SCC determination.[171] Legislation will admittedly be difficult to enact because climate change has become such a polarized political problem.[172] But this avenue will face the least legal opposition. As previously mentioned, a recent district court decision concluded that President Biden's Executive Order 13,990 violated the major questions doctrine by enforcing interim estimates that considered global effects.[173] Until the consideration of global effects in formulating SCC values is expressly accepted by Congress, it will likely be extremely difficult to require utilization of such values through executive action.

If the SCC Working Group's SCC value somehow avoids consideration of global effects, the major questions doctrine barrier will likely not exist, and requiring the SCC in EIS can be accomplished through either legislation or CEQ guidance.[174] The CEQ is authorized through Executive Order 11,991 to issue regulations for the implementation of the procedural provisions of NEPA.[175] Thus,

169. *See* Hughes River Watershed Conservancy v. Glickman, 81 F.3d 437, 446 (4th Cir. 1996).

170. *See id.* at 447.

171. The CEQ received its authority to regulate regarding NEPA procedure through Executive Order in 1978. *See* Exec. Order No. 11,991; 3 C.F.R., 1977 Comp., pp. 123–24 (1977). The Supreme Court has held that CEQ guidance is entitled to "substantial deference." *See e.g.*, Marsh v. Or. Nat. Res. Council, 490 U.S. 360, 372 (1989) (citing Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 335 (1989)).

172. Cale Jaffe, *Melting the Polarization Around Climate Change Politics*, 30 GEO. ENV'T L. REV. 455, 459 (2018).

173. *See* Louisiana v. Biden, No. 2:21-CV-01074, 2022 U.S. Dist. LEXIS 25496, at *33–34 (W.D. La. Feb. 11, 2022)

174. *See* Exec. Order No. 11,991, 3 C.F.R., 1977 Comp., pp. 123–24 (1977).

175. *See id.*

provided that the SCC value does not conflict with any other aspect of congressional intent so as to raise the major questions doctrine, the CEQ guidance will be entitled to "substantial deference."[176]

While the Biden Administration or future administration should explicitly mandate incorporation of the SCC in EIS, existing CEQ guidance might already offer a route for requiring the SCC. In *Vecinos*, the petitioners argued that Section 1501.21(c) of the CEQ's NEPA implementing regulations required FERC to utilize the SCC or another generally accepted method to assess GHG emissions.[177] The D.C. Circuit held that FERC was required to explain whether Section 1502.21(c) required the Commission to apply the SCC or another analytical framework as "'generally accepted in the scientific community' within the meaning of the regulation, and if not, why not."[178] Section 1502.21 states that if the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained due to unreasonable costs or unknown means of obtaining the information, EIS should include the agency's evaluation "based upon theoretical approaches or research methods generally accepted in the scientific community."[179] Deciding which methods of measuring the environmental impacts of GHG emissions are "generally accepted" will be controversial. However, *Vecinos* indicates the court's changing attitudes gradually favoring the SCC as a generally accepted analytical tool.

C. There Should be an Absolute Cap on the SCC Permitted per Federal Action

Lastly, an absolute SCC cap should be placed on NEPA projects. One of the arguments by defendant FERC in *EarthReports* for failing to use the SCC to calculate GHG emissions impacts was that there was a lack of established criteria as to whether a monetary cost would be considered "significant" for NEPA purposes.[180] Placing a ceiling on

176. *See e.g.*, *Marsh*, 490 U.S. at 372 (citing *Robertson*, 490 U.S. at 335). It is possible that the major questions doctrine will be invoked more frequently to oppose executive action following the Supreme Court's decision in *West Virginia v. EPA. See* W. Va. v. Env't Prot. Agency, 142 S. Ct. 2587, 2614 (2022). The extent of the doctrine's invocation is currently unpredictable.

177. *See* Vecinos para el Bienestar de la Comunidad Costera v. Fed. Energy Regul. Comm'n, 6 F.4th 1321, 1329–30 (D.C. Cir. 2021).

178. *Id.* at 1330.

179. 40 C.F.R. § 1502.21(c)(4) (2022).

180. *See* EarthReports, Inc. v. Fed. Energy Regul. Comm'n, 828 F.3d 949, 956 (D.C. Cir. 2016).

the SCC will make the determination of whether environmental costs are "significant" explicit, enabling agencies to make informed development choices for carbon-intensive projects. Agencies will have a clear understanding of the environmental costs that cannot be surpassed. This step will encourage consistency among agencies as to the extent of acceptable environmental damages. And as previously suggested, where defined limits exist on carbon emissions, litigation will likely subside in direct correlation with the subsidence of arbitrary agency decision-making.

While an SCC cap for federal projects might seem like a drastic step, it is normatively desirable as human activities accelerate the threats of climate change.[181] Many agencies are currently failing to make fully informed decisions that consider the cost that federal projects will have on future generations. But heat waves, droughts, floods, wildfires, and melting glaciers are constant reminders that it is time to hold agencies accountable for the wide-ranging environmental costs of their actions.[182]

CONCLUSION

In order to establish greater consistency in NEPA Environmental Impact Statements, the SCC should be stabilized by a bipartisan Working Group, and federal agencies should be required to include the SCC for all project alternatives in Environmental Impact Statements. There should also be an absolute SCC cap for NEPA projects—the severe damages associated with climate change call for a strict line to be drawn expressing how much of a toll on our planet's survival and our quality of life we are willing to allow agency actions to take.

181. *See* Rebecca Hersher, *A Major Report Warns Climate Change is Accelerating and Humans Must Cut Emissions Now*, NPR (Aug. 9, 2021, 4:00 AM), https://www.npr.org/2021/08/09/1025898341/major-report-warns-climate-change-is-accelerating-and-humans-must-cut-emissions-; *see also* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2021: THE PHYSICAL SCIENCE BASIS SPM-5 (2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf.

182. *See* Hersher, *supra* note 181; INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 181, at SPM-10.