

THE CO₂ MONETIZATION GAP: INTEGRATING THE SOCIAL COST OF CARBON INTO NEPA

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*This Note examines the disparate treatment of greenhouse gas (GHG) emissions in the regulatory cost–benefit analysis and the National Environmental Policy Act (NEPA) review contexts. In *Zero Zone, Inc. v. United States Department of Energy*, the Seventh Circuit upheld the use of the social cost of carbon (SCC) when agencies consider GHG emissions in their cost–benefit analyses. At the same time, courts have almost uniformly rejected challenges that agencies should use the SCC when conducting environmental impact statements under NEPA on grounds that directly contradict the Seventh Circuit’s reasoning.*

This disparate treatment is problematic: Because NEPA covers a broader category of federal actions than does the regulatory cost–benefit analysis mandate, agencies assess the environmental consequences of a significant number of federal actions without utilizing the SCC. This Note labels this chasm in the GHG reporting regime the “CO₂ monetization gap” and examines the foreign-investment activities of the Export-Import Bank (Ex-Im) to demonstrate that it has contributed to poor decisionmaking. Ex-Im is a major financier of fossil fuel projects abroad and does not currently utilize the SCC in assessing the climate effects of its activities. Though Ex-Im’s activities are justified on economic grounds, the benefits of the program are a mirage—when the SCC is applied to these activities, the economic benefits of the program largely disappear.

This Note argues that integration of the SCC into the NEPA review process is both normatively desirable and legally feasible. It also addresses various strategies states may employ to mitigate the consequences of the CO₂ monetization gap.

INTRODUCTION

The destructive costs associated with climate change are no longer a distant hypothetical. Globally, 21.5 million people per year are displaced from their homes due to extreme weather events.¹ In the United States,

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1. Frequently Asked Questions on Climate Change and Disaster Displacement, United Nations High Comm’r for Refugees (Nov. 6, 2016), <http://www.unhcr.org/en-us/news/latest/2016/11/581f52dc4/frequently-asked-questions-climate-change-disaster-displacement.html> [<http://perma.cc/XB4D-K2YB>]. Native American communities in Alaska and Louisiana have been the first to face climate relocation in the United States. See Maxine Burkett, Robert R.M. Verchick & David Flores, Ctr. for Progressive Reform, *Reaching Higher Ground: Avenues to Secure and Manage New Land for*

2017 surpassed 2005 as the most expensive hurricane season on record.² These phenomena are associated with changing weather patterns due to climate change³ and are but one component of the catastrophic costs that accompany a warming climate.⁴

Federal agencies have begun incorporating such costs into regulatory cost–benefit analyses. Currently, executive agencies may adopt new regulations only upon finding that their benefits justify their costs.⁵ In performing these cost–benefit analyses, agencies are required to consider the regulation’s climate effects.⁶ In 2009, the Obama Administration created an interagency working group to develop the social cost of carbon (SCC)—an analytical tool that aggregates the costs associated with a federal rule or program’s greenhouse gas (GHG) emissions⁷—to create greater uniformity in how federal agencies treat GHG emissions in

Communities Displaced by Climate Change 6 (2017), http://progressivereform.org/articles/ReachingHigherGround_1703.pdf [<http://perma.cc/Y8LV-Y989>].

2. Willie Drye, 2017 Hurricane Season Was the Most Expensive in U.S. History, *Nat’l Geographic* (Nov. 30, 2017), <http://news.nationalgeographic.com/2017/11/2017-hurricane-season-most-expensive-us-history-spd/> [<http://perma.cc/97AS-NUG7>]. The 2017 U.S. hurricane season is estimated to have caused more than \$200 billion in damages. *Id.*; see also Brian K. Sullivan, The Most Expensive U.S. Hurricane Season Ever: By the Numbers, *Bloomberg* (Nov. 26, 2017), <http://www.bloomberg.com/news/articles/2017-11-26/the-most-expensive-us-hurricane-season-ever-by-the-numbers> [<http://perma.cc/SD9L-V38M>] (discussing the effects of the 2017 hurricane season). The long-term economic consequences of Hurricane Maria on Puerto Rico are unknown, but could be devastating. See Solomon Hsiang & Trevor Houser, Opinion, Don’t Let Puerto Rico Fall into an Economic Abyss, *N.Y. Times* (Sept. 29, 2017), <http://www.nytimes.com/2017/09/29/opinion/puerto-rico-hurricane-maria.html> (on file with the *Columbia Law Review*) (estimating Hurricane Maria could decrease Puerto Rican incomes by twenty-one percent over the next fifteen years).

3. See Robinson Meyer, Did Climate Change Intensify Hurricane Harvey?, *Atlantic* (Aug. 27, 2017), <http://www.theatlantic.com/science/archive/2017/08/did-climate-change-intensify-hurricane-harvey/538158/> [<http://perma.cc/J5VX-QMDE>] (explaining how climate change exacerbates and increases the frequency of extreme weather events like Hurricane Harvey); see also U.S. Nat’l Climate Assessment, *Climate Change Impacts in the United States: Extreme Weather* (2014), http://s3.amazonaws.com/nca2014/low/NCA3_Climate_Change_Impacts_in_the_United%20States_LowRes.pdf?download=1 [<http://perma.cc/RED7-ABPK>].

4. Other damages include “changes in net agricultural productivity, energy use, human health, . . . as well as nonmarket damages, such as the services that natural ecosystems provide to society.” *Nat’l Acad. of Scis., Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide* 5 (2017).

5. Exec. Order No. 13,563, 3 C.F.R. 215, 215 (2012).

6. See *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1203 (9th Cir. 2008) (holding “NHTSA’s decision not to monetize the benefit of carbon emissions reduction” in its cost–benefit analysis for auto emissions standards was arbitrary and capricious).

7. The SCC includes costs associated with agricultural and human health effects, property damage, and changes in energy systems due to climate change. Interagency Working Grp. on Soc. Cost of Carbon, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, at 1, 4–8 (2010), http://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf [<http://perma.cc/9VK7-R9D5>].

their cost–benefit analyses.⁸ Agency use of the SCC was controversial from the start and received strenuous pushback from industry.⁹ However, in a landmark decision in 2016, the Seventh Circuit upheld the use of the SCC in the regulatory cost–benefit context.¹⁰

Yet, despite the relative progress made in this context,¹¹ the internalization of climate costs into the federal agency decisionmaking process remains incomplete and wholly inadequate. The approach adopted in the regulatory cost–benefit context contrasts starkly with that taken in the environmental review process required of federal agencies under the National Environmental Policy Act (NEPA).¹² NEPA’s reach is in many ways broader than that of the regulatory cost–benefit analysis mandate and applies to federal permit approvals, federal programs, and some government financing projects, in addition to proposed regulations.¹³ NEPA review requires a qualitative consideration of GHG emissions,¹⁴ but it does not, as currently undertaken, require quantification of GHG emissions using the SCC when agencies evaluate the climate effects of federal programs.¹⁵ Most courts that have addressed the issue have concluded that

8. *Id.* at 1; see also Jane A. Leggett, Cong. Research Serv., R44657, *Federal Citations to the Social Cost of Greenhouse Gases 1–2* (2017), <http://fas.org/sgp/crs/misc/R44657.pdf> [<http://perma.cc/9TRX-BHZC>] (providing a comprehensive list of the federal uses of the SCC).

9. See *infra* section I.A.2 (discussing controversies surrounding the SCC).

10. *Zero Zone, Inc. v. U.S. Dep’t of Energy*, 832 F.3d 654, 677–80 (7th Cir. 2016).

11. At the time of this writing, the Trump Administration has signaled its intent to roll back the Obama Administration’s progress in this area. On March 28, 2017, President Trump signed an executive order that disbanded the Interagency Working Group in charge of developing the SCC and withdrew the metric’s technical support documents. See Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (Mar. 28, 2017). While the executive order directs agencies to calculate GHG emissions in accordance with guidance in OMB Circular A-4, *id.*, it is unclear whether agencies will use a modified SCC and, if they do, whether the new SCC values will survive judicial review. Part III of this Note addresses the continued relevance of the SCC despite the current Administration’s hostility toward the tool.

12. NEPA requires that federal agencies prepare an environmental impact statement (EIS) when undertaking actions that will “significantly affect[] the quality of the human environment.” 42 U.S.C. § 4332(C) (2012).

13. 40 C.F.R. § 1508.18 (2017); see also *infra* note 155 (discussing the overlap between NEPA and the regulatory cost–benefit analysis mandate).

14. See *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1217 (9th Cir. 2008) (finding GHG emissions should be considered under NEPA).

15. The Council on Environmental Quality (CEQ), the agency that administers NEPA, held the position that NEPA review does not require the monetization of climate effects. Council on Env’tl. 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 32* (2016) [hereinafter CEQ, GHG Final Guidance], http://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf [<http://perma.cc/WFV5-DAM8>]. President Trump directed CEQ to withdraw this final guidance in his March 2017 executive order. See Exec. Order No. 13,783, 82 Fed. Reg. at 16,094.

an agency does not act arbitrarily and capriciously by electing to not utilize the SCC in its NEPA analysis.¹⁶

The disparity in the treatment of climate change effects under the regulatory cost–benefit and NEPA-review mandates has a significant practical consequence: Federal agencies do not need to consider or provide to the public the monetary impacts of GHG emissions associated with many carbon-intensive federal programs. This is true even of programs that are justified by their aggregate economic benefits. This Note labels this chasm in the federal GHG reporting scheme—in which agency activities with anticipated GHG effects are subject to NEPA but not to the regulatory cost–benefit analysis mandate and, thus, are not evaluated using the SCC—the “CO₂ monetization gap.”

The GHG reporting of the activities of the Export-Import Bank (Ex-Im), which promotes the export of U.S. goods and services by providing financing for high-risk projects domestically and internationally,¹⁷ offers a prime illustration of the consequences of the CO₂ monetization gap. In 2011, Ex-Im’s financing activities generated \$4.9 billion in U.S. exports for fossil-fuel projects that will emit sixty-eight million metric tons of CO₂ per year.¹⁸ The Agency does not use the SCC in its NEPA review of financing projects—yet, when considering the lifetime climate effects of these activities, the purported economic benefits disappear.¹⁹

This Note argues that the CO₂ monetization gap has led to suboptimal decisionmaking in GHG-intensive federal programs and is inconsistent with NEPA’s twin aims: (1) to ensure that federal actors consider the present and future consequences of their decisions and (2) to meaningfully inform other government actors and the public of the environmental impacts of proposed projects.²⁰ Further, this Note advances the argument that the Seventh Circuit’s reasoning in *Zero Zone, Inc. v. United States Department of Energy* is inconsistent with the prevailing treatment of the SCC and GHG emissions in the NEPA context.²¹ Its

16. See *infra* section I.B.3 (discussing the applicability of the SCC in the NEPA-review context). Courts justify this conclusion by alluding to the analytical difficulty and scientific uncertainty surrounding monetizing GHG emissions. See *infra* section I.B.3.

17. About Us, Exp.-Imp. Bank of the U.S., <http://www.exim.gov/about> [<http://perma.cc/E68X-H8RU>] [Exp.-Imp. Bank of the U.S., About Us] (last visited Oct. 10, 2017).

18. 2011 Exp.-Imp. Bank of the U.S. Ann. Rep. 20 [hereinafter 2011 Ex-Im Annual Report]. These CO₂ figures do not include the potentially far more significant downstream GHG emissions resulting from fossil-fuel consumption from these projects, *id.*, and thus, underestimate the magnitude of the problem.

19. See *infra* section II.B.3 (applying the SCC to Ex-Im’s activities).

20. See *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 768 (2004) (describing the dual purposes of NEPA’s environmental impact statement requirement); *Columbia Basin Land Prot. Ass’n v. Schlesinger*, 643 F.2d 585, 592 (9th Cir. 1981) (same).

21. 832 F.3d 654 (7th Cir. 2016). To clarify, this Note does not argue that the Seventh Circuit’s decision, on its own, requires agencies, like the Department of Energy, to consider the SCC. See *infra* section II.A.

structure proceeds as follows: Part I provides an overview of the SCC and its use in the regulatory cost–benefit context. It also introduces the NEPA-review process and its GHG reporting requirements. Part II then explores the tension between the GHG reporting approach currently taken in the regulatory cost–benefit and NEPA-review contexts. It also illustrates how the CO₂ monetization gap has led to poor decisionmaking by examining Ex-Im’s GHG disclosures. Part III provides a normative justification for the incorporation of the SCC into NEPA’s environmental impact statement requirement, arguing that legal integration of the SCC into the NEPA environmental review process would best fulfill the goals of NEPA. Part III concludes by assessing the legal feasibility of implementing the SCC into NEPA review via CEQ regulation or executive order and discusses efforts states may undertake to minimize the effects of the CO₂ monetization gap.

I. GHG REPORTING IN REGULATORY COST–BENEFIT ANALYSIS AND IN NEPA REVIEW

Both the regulatory cost–benefit analysis mandate and NEPA review require consideration of GHG emissions.²² However, the GHG reporting requirements under the two programs differ greatly in their treatment of climate effects. While the SCC has been embraced in the cost–benefit context²³—creating a de facto requirement that agencies utilize the SCC in assessing the costs and benefits of a proposed regulation—the use of the SCC has largely been rejected in the NEPA-review process.

This Part provides an overview of the GHG reporting requirements in the regulatory cost–benefit and NEPA-review contexts. Section I.A traces the development of, and the controversies surrounding, the use of the SCC by agencies when they conduct cost–benefit analyses. It also analyzes the *Zero Zone, Inc.* decision, which upheld the use of the SCC in this setting. Section I.B introduces the NEPA-review process and its GHG reporting requirements. It then considers recent court decisions examining the use of the SCC in the NEPA-review process.

A. *The Regulatory Cost–Benefit Mandate and the Social Cost of Carbon*

Executive Order 13,563 requires that agencies conduct cost–benefit analyses for proposed regulations and that regulations be economically

22. See *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1203, 1216–17 (9th Cir. 2008) (finding the National Highway Traffic Safety Administration’s failures to monetize the benefit of carbon emissions reduction and to consider GHGs in its NEPA review were arbitrary and capricious).

23. At the time of this writing, it is unclear whether federal agencies will continue to utilize the SCC under the Trump Administration’s leadership. The topic is considered *infra*, in Part III.

justified.²⁴ In these analyses, agencies must consider the costs and benefits of GHG emissions resulting from the proposed regulation.²⁵ Section I.A.1 traces the history of the SCC in this context. Section I.A.2 then discusses the controversies surrounding the development of the SCC. Finally, section I.A.3 examines the Seventh Circuit's recent decision in *Zero Zone, Inc. v. United States Department of Energy*.

1. *The Duty to Monetize GHG Emissions and the Origins of the SCC.* — The history of the duty to consider the effects of GHG emissions in the regulatory cost–benefit analysis context began with the Ninth Circuit's decision in *Center for Biological Diversity v. NHTSA*.²⁶ In that case, the court rejected the National Highway Traffic Safety Administration's (NHTSA) decision not to include carbon emissions reductions in its cost–benefit analysis for a new average fuel economy standard for light trucks.²⁷ The court concluded that NHTSA's failure to do so was arbitrary and capricious when it had quantified economic benefits, including impacts on employment and sales, associated with the new rule.²⁸

In response to this decision, the Office of Management and Budget and the Council of Economic Advisers convened an interagency working group in 2009 to create a uniform method for agencies to incorporate “the social benefits of reducing carbon dioxide . . . emissions into cost–benefit analyses of regulatory actions.”²⁹ This effort culminated in the development of the SCC—a tool that estimates “the long-term damage done by a ton of carbon dioxide (CO₂) emissions in a given year.”³⁰ The SCC incorporates changes in agricultural productivity and human health, property damage from flooding, and changes in energy-system costs, which are aggregated in a present value of climate change damages.³¹ The SCC offers cost projections employing three discount rates: 5%, 3%, and

24. Exec. Order No. 13,563, 3 C.F.R. 215, 215 (2012). This executive order built on the Clinton-era Executive Order 12,866. *Id.*; see also Exec. Order No. 12,866, 3 C.F.R. 638 (1994). Similar executive orders have existed since the Reagan Administration. See Richard L. Revesz & Michael A. Livermore, Retaking Rationality: How Cost–Benefit Analysis Can Better Protect the Environment and Our Health 11 (2008).

25. *Ctr. for Biological Diversity*, 538 F.3d at 1203.

26. *Id.*; Jonathan S. Masur & Eric A. Posner, Climate Regulation and the Limits of Cost–Benefit Analysis, 99 Calif. L. Rev. 1557, 1559 (2011).

27. *Ctr. for Biological Diversity*, 538 F.3d at 1198–203.

28. *Id.*

29. Intergency Working Grp. on Soc. Cost of Greenhouse Gases, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis 3 (2016), http://www.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf [<http://perma.cc/QQQ7-LXFT>].

30. EPA, EPA Fact Sheet: Social Cost of Carbon 1 (2016) [hereinafter EPA, SCC Fact Sheet], http://www.epa.gov/sites/production/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf [<http://perma.cc/S8B3-H46W>].

31. *Id.* The aggregated present value of a metric ton of carbon dioxide emitted includes costs associated with the release from the time of the emission through the year 2300. *Id.*

2.5%.³² At these discount rates, the current SCC estimates that a metric ton of CO₂ emitted in 2015 costs \$11, \$36, and \$56, respectively.³³

The SCC was widely used by agencies under the Obama Administration in a variety of contexts to reinforce the justification for energy-efficiency measures, fuel-efficiency standards, and regulatory actions having beneficial climate effects.³⁴ The first regulation to employ the federal SCC was the Department of Transportation's Corporate Average Fuel Economy standards for passenger cars and light trucks, promulgated in March 2009.³⁵ Since then, dozens of other final rules have utilized the interagency working group's SCC figure in cost-benefit analyses.³⁶

2. *Controversies Surrounding the Social Cost of Carbon.* — Agency use of the SCC has been controversial from the beginning. Specifically, the discount rates used, the SCC's treatment of unknown risks, and the metric's consideration of global costs have been particularly contentious.³⁷

Because the SCC incorporates *future* costs associated with GHG emissions, a discount rate is employed to convert costs associated with future emissions into present-day dollars.³⁸ The chosen discount rate is important because small changes in the discount rate can result in huge cost changes in the context of climate change.³⁹ As the discount rate is increased, the projected cost of emitting a ton of GHGs will decrease—likewise, as the discount rate is decreased, the projected cost of emitting a ton of GHGs will increase.⁴⁰ Accordingly, deciding which discount rate to utilize is a highly controversial task. Some academics argue that the discount rates used are too high given the intergenerational problem of climate change.⁴¹ Conservative and industry groups have generally

32. *Id.* at 3. The SCC also provides projections using values corresponding with the ninety-fifth percentile of the frequency distribution based on a 3% discount rate, representing a low-probability, high-impact outcome scenario. *Id.*

33. *Id.* at 4. The 3%–ninety-fifth percentile value is estimated at \$105 per metric ton.

34. See Leggett, *supra* note 8, at 2–12 (providing federal citations to the SCC).

35. *Id.* at 3.

36. *Id.* at 3–12. The SCC was used to support a wide range of rules, including the Clean Power Plan, the Cross-State Air Pollution Rule Update for the 2008 Ozone National Ambient Air Quality Standards, more stringent automobile fuel efficiency standards, and a broad array of energy efficiency guidelines. *Id.*

37. See *infra* notes 38–51 and accompanying text (describing controversies of the SCC).

38. EPA, SCC Fact Sheet, *supra* note 30, at 1–2.

39. Daniel A. Farber, *Coping with Uncertainty: Cost-Benefit Analysis, the Precautionary Principle, and Climate Change*, 90 Wash. L. Rev. 1659, 1694–95 (2015) [hereinafter Farber, *Coping with Uncertainty*] (explaining the significance of the discount rate and noting there is no consensus about what discount rate should be used for climate change costs).

40. See EPA, SCC Fact Sheet, *supra* note 30, at 2.

41. See, e.g., Frank Ackerman & Elizabeth A. Stanton, *The Social Cost of Carbon*, *Real-World Econ. Rev.*, June 2010, at 129, 137, 141 [hereinafter Ackerman & Stanton, *The Social Cost of Carbon*], <http://www.paecon.net/PAEReview/issue53/whole53.pdf> [[http://](http://www.paecon.net/PAEReview/issue53/whole53.pdf)

argued, however, that a discount rate of 7%—the rate that the Office of Management and Budget typically uses for valuing future lives—would be more appropriate.⁴²

The SCC has also been criticized for insufficiently considering *unknown* risks associated with aggregate GHG emissions. Critics argue that a proper carbon price must take into consideration the possibility of “tipping points,” or extremely bad outcomes—for instance, the possibility that climate change will release methane that is now trapped in the frozen Arctic, accelerating warming, causing the release of more methane, and resulting in a disastrous feedback loop.⁴³ Taking these unknown risks into consideration, the SCC might be far *lower* than is appropriate to truly encompass the risks climate change poses.

Equally controversial is the SCC’s inclusion of *global*, rather than merely domestic, costs of climate change. The use of global costs reflects a departure from the traditional cost–benefit approach,⁴⁴ since a typical U.S. regulation primarily impacts the domestic United States,⁴⁵ and incorporating extraterritorial costs could be seen as inappropriately accounting for foreign interests in U.S. GHG-mitigation efforts.⁴⁶ Furthermore,

perma.cc/U5ZR-ZMHU] (arguing the use of market discount rates across longer time spans is questionable).

42. See, e.g., David Kreutzer, Discounting Climate Costs, Heritage Found. (June 16, 2016), <http://www.heritage.org/research/reports/2016/06/discounting-climate-costs> [<http://perma.cc/T5EH-2E3Z>] (arguing for the application of a 7% discount rate). But see Melissa J. Luttrell, The Social Cost of Inertia: How Cost-Benefit Incoherence Threatens to Derail U.S. Climate Action, 25 Duke Envtl. L. & Pol’y F. 131, 173–74 (2014) (arguing the discount rates employed by the interagency working group are consistent with the prescriptive intentions of the Clean Air Act).

43. See William Nordhaus, The Climate Casino: Risk, Uncertainty, and Economics for a Warming World 142–43 (2013) (arguing for the need to consider “tipping points”); Farber, Coping with Uncertainty, *supra* note 39, at 1696 (“Another key issue in terms of the economic analysis is the possibility of unexpectedly bad outcomes . . .”); Ackerman & Stanton, The Social Cost of Carbon, *supra* note 41, at 138 (“The administration’s estimates of the [SCC] largely omit the risk of catastrophic climate damage.”).

44. See Ted Gayer & W. Kip Viscusi, Brookings Inst., Determining the Proper Scope of Climate Change Benefits 21 (2014), http://www.brookings.edu/wp-content/uploads/2016/06/04_determining_proper_scope_climate_change_benefits.pdf [<http://perma.cc/C5S3-JC4T>] (arguing the justification for the global approach is weak and resource-allocation shifts result from this approach); see also Peter Howard & Jason Schwartz, Think Global: International Reciprocity as Justification for a Global Social Cost of Carbon, 42 Colum. J. Envtl. L. 203, 206 (2017) (“Typically, U.S. regulatory impact analyses focus on costs and benefits to the United States . . .”).

45. Howard & Schwartz, *supra* note 44, at 206.

46. Gayer & Viscusi, *supra* note 44, at 16–23 (considering the various justifications for a global approach and arguing for an “increased emphasis in trying to distinguish what the pertinent value of the global impacts of SCC reductions are from a domestic perspective”). Professors Peter Howard and Jason Schwartz offer the prospect of international reciprocity as a justification for the inclusion of global, rather than domestic, costs associated with GHG emissions. Howard & Schwartz, *supra* note 44, at 210. This issue is addressed at greater length *infra*, in section III.B.

including global costs has legal ramifications; Professor Arden Rowell argues that this approach mandates a statute-by-statute analysis to determine whether consideration of global costs is consistent with the relevant statute being administered.⁴⁷ Other commentators have defended the inclusion of global costs on moral grounds.⁴⁸

More fundamentally, however, some commentators oppose the use of any form of cost–benefit analysis in examining the impacts of climate change. Professors Jonathan Masur and Eric Posner, for instance, argue that cost–benefit analysis is inappropriate “whenever a regulation raises principally normative, political, and institutional questions, rather than technical ones.”⁴⁹ Professors Frank Ackerman and Lisa Heinzerling argue that cost–benefit analysis is improper when it would require the translation of “priceless” values—such as lives, health, and the natural environment—into monetary terms.⁵⁰ Despite its many controversies, the SCC has become a staple of the regulatory cost–benefit analysis process and will likely remain so in future administrations.⁵¹

3. *Challenging the Social Cost of Carbon: Zero Zone, Inc. v. Department of Energy.* — In 2016, the SCC finally had its day in court. In *Zero Zone, Inc. v. United States Department of Energy*, industry groups challenged a Department of Energy (DOE) regulation requiring improved energy efficiency standards for commercial refrigeration equipment.⁵² Plaintiffs made two specific challenges: (1) the SCC’s compatibility with the Energy Policy and Conservation Act (EPCA) and (2) the specific application of the SCC in DOE’s cost–benefit analysis used to justify the rule.⁵³

As to the first challenge, the plaintiffs claimed that the EPCA did not allow for the consideration of GHGs.⁵⁴ Relying on *National Ass’n of Home Builders v. Defenders of Wildlife*,⁵⁵ the Seventh Circuit summarily dismissed this argument, finding that the statutory requirement that DOE consider

47. Arden Rowell, *Foreign Impacts and Climate Change*, 39 *Harv. Envtl. L. Rev.* 371, 375 (2015). The legal implications of this consideration are examined in more detail *infra*, in section III.B.1. Industry has also challenged the inclusion of global costs, as is discussed *infra*, in section I.A.3.

48. See, e.g., Luttrell, *supra* note 42, at 174–76 (“[T]he United States should not make policy decisions that rely on welfare analyses wherein most of the global harms the United States causes to human welfare are automatically set to zero.”).

49. Masur & Posner, *supra* note 26, at 1596–99.

50. Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 *U. Pa. L. Rev.* 1553, 1583–84 (2002).

51. See *supra* notes 34–36 and accompanying text (discussing the extent of the Obama Administration’s use of the SCC); see also *infra* Part III (discussing the SCC’s continued relevance under the Trump Administration).

52. 832 F.3d 654, 660–61 (7th Cir. 2016).

53. *Id.* at 677–80.

54. *Id.* at 677. The petitioners further argued that the SCC was flawed for certain procedural and substantive reasons. *Id.* at 678.

55. 551 U.S. 644 (2007).

energy conservation demanded that environmental costs, including costs associated with climate change, be taken into consideration.⁵⁶ The court then concluded that DOE had recognized possible shortcomings in the SCC, but had sufficiently demonstrated why the SCC could nonetheless be utilized.⁵⁷

As to the merits of the SCC itself, the petitioners challenged the time scale employed in the SCC, arguing that DOE “arbitrarily considered indirect *benefits* like carbon reduction over hundreds of years,” while ignoring long-term employment effects.⁵⁸ Plaintiffs further argued that DOE arbitrarily considered global environmental benefits from carbon reduction, while only considering national costs, thereby weighing the cost–benefit analysis in favor of regulation.⁵⁹

Again, the court disposed of the plaintiffs’ claims in summary fashion. The court accepted DOE’s argument that there was no inconsistency in the timeframes applied for costs and benefits, as well as DOE’s choice of discount rates: Because the SCC estimates represent “the full discounted value . . . of emissions reductions occurring in a given year,” a “reduction of carbon over thirty years would have long-term effects on the environment.”⁶⁰ At the same time, the court reasoned, wages bring the labor market into equilibrium so increased costs over thirty years would not have long-term employment effects.⁶¹ Thus, the court concluded, DOE’s analysis was neither arbitrary nor capricious.⁶²

Significantly, the court also rejected the plaintiffs’ challenge based on the SCC’s inclusion of global benefits.⁶³ Implicitly accepting DOE’s argument that national energy conservation has global effects that should be reviewed when considering national policy, the court examined whether there were any global costs that DOE ignored in its analysis.⁶⁴ Finding none, the court concluded that inclusion of global benefits was reasonable under the circumstances.⁶⁵

In summary, the Seventh Circuit proceeded in a highly deferential manner in *Zero Zone, Inc.*, upholding a number of the more controversial aspects of the SCC in the cost–benefit regulatory analysis context, including the SCC’s selection of discount rates and its inclusion of global

56. *Zero Zone, Inc.*, 832 F.3d at 677 (quoting *Defenders of Wildlife*, 551 U.S. at 658). The court further concluded that Congress intended DOE to consider the monetized impacts of climate change. *Id.*

57. *Id.* at 678.

58. *Id.*

59. *Id.* at 679.

60. *Id.* at 678–79.

61. *Id.* at 679.

62. *Id.*

63. *Id.*

64. *Id.*

65. *Id.*

climate costs.⁶⁶ The decision also read the language of the EPCA broadly when it found that Congress intended DOE to consider the SCC in furthering energy conservation,⁶⁷ thus leaving DOE and other federal agencies with significant discretion to utilize the SCC in the cost–benefit context, despite its inherent flaws and uncertainties.

B. *The National Environmental Policy Act*

President Nixon signed NEPA, what some have deemed the “environmental bill of rights,”⁶⁸ into law on January 1, 1970.⁶⁹ NEPA declares that it is the continuing policy of the government to serve as a trustee of the environment for future generations; to assure a safe and healthful environment; to attain development without degradation; to preserve important historic, cultural, and natural aspects of our heritage; to curb consumption in light of population growth; and to promote the use of renewable resources.⁷⁰

Despite this sweeping substantive language, NEPA’s reach has largely been procedural.⁷¹ Courts have interpreted NEPA as not mandating any particular environmental outcome, but as requiring that federal agencies conduct an environmental review and consider the environmental consequences of a proposed action.⁷² Section I.B.1 provides an overview of NEPA’s environmental reporting requirements, section I.B.2 discusses GHG emissions reporting under the Act, and section I.B.3 addresses the use of the SCC in NEPA review.

1. *NEPA and the Environmental Impact Statement.* — The operational part of NEPA is section 102, which lays out reporting and procedural requirements for federal agencies and agents when they undertake actions that have significant environmental impacts.⁷³ Section 102 mandates that all agencies of the federal government undertaking “major Federal actions significantly affecting the quality of the human environment”

66. *Id.* at 677–80.

67. See *supra* notes 54–57 and accompanying text.

68. Eva H. Hanks & John L. Hanks, *An Environmental Bill of Rights: The Citizen Suit and the National Environmental Policy Act of 1969*, 24 *Rutgers L. Rev.* 230, 230 (1970).

69. National Environmental Policy Act, White House, <http://www.whitehouse.gov/ceq/nepa> [<http://perma.cc/2LC2-D3ZB>] (last visited Jan. 20, 2018).

70. 42 U.S.C. § 4331(b)(1)–(6) (2012).

71. See *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 558 (1978) (“[NEPA’s] mandate to the agencies is essentially procedural.”); Michael C. Blumm & Keith Mosman, *The Overlooked Role of the National Environmental Policy Act in Protecting the Western Environment: NEPA in the Ninth Circuit*, 2 *Wash. J. Envtl. L. & Pol’y* 193, 195 n.3 (2012) (describing early court decisions interpreting NEPA as imposing a substantive mandate on agencies and the later rejection of this view).

72. *Strycker’s Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 227–28 (1980) (holding a court cannot “interject itself within the area of discretion of the executive”).

73. 42 U.S.C. § 4332.

include an environmental impact statement (EIS) detailing: (1) the environmental impact of the proposed action; (2) any unavoidable adverse environmental effects associated with the action; (3) alternatives to the proposed action; (4) the long-term consequences of the action; and (5) any irreversible and irretrievable commitments of resources involved in fulfilling the proposed action.⁷⁴ The EIS requirement serves two purposes: to “ensure[] that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts [and] [to] guarantee[] that the relevant information will be made available to the larger audience that may also play a role in . . . the decisionmaking process.”⁷⁵

In practice, the NEPA review process proceeds as follows. An agency first determines whether the given proposal is one that normally requires an EIS or if some categorical exclusion applies.⁷⁶ If the proposed action falls into neither category, the agency must prepare an environmental assessment (EA) to determine if an EIS is needed.⁷⁷ EAs must include a brief discussion of the need for the project, alternatives to the proposal, and the environmental impacts of the proposed action and considered alternatives.⁷⁸ When an EIS is required, CEQ regulations mandate that the statement be “concise, clear, and to the point,” and that it provide evidence that the agency has made the necessary environmental analysis as required by section 102.⁷⁹ The regulations also demand that agencies explore alternatives to the proposed action, instructing agencies to present the environmental impacts of the proposal and the alternatives in comparative form, to devote substantial treatment to each option considered, and to analyze the choice of no action.⁸⁰

EISs are not required for all federal actions—NEPA review applies only to “major federal actions significantly affecting the quality of the human environment.”⁸¹ “Major federal actions” include projects, programs, policies, or rules funded or carried out by the federal government and certain private projects that require federal approval.⁸² Moreover, federal funding of a project may necessitate preparation of an EIS; such an

74. 42 U.S.C. § 4332(C)(i)–(v).

75. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

76. 40 C.F.R. § 1501.4(a) (2017). If the action falls into the former category, an EIS is prepared. *Id.*

77. *Id.* § 1501.4(b).

78. *Id.* § 1508.9.

79. *Id.* § 1502.1. President Carter’s Executive Order 11,991 grants CEQ the authority to promulgate regulations specifying detailed reporting requirements of the environmental impact statements prepared by agencies. Exec. Order No. 11,991, 3 C.F.R. 123, 124 (1978). Such requirements are codified at 40 C.F.R. §§ 1500–1508.

80. 40 C.F.R. § 1502.14(a)–(d).

81. 42 U.S.C. § 4332(2)(C) (2012).

82. 40 C.F.R. § 1508.18.

inquiry requires examination of the extent of federal involvement.⁸³ Determining whether an action will “significantly” affect the environment requires consideration of both the context and intensity of its potential effects.⁸⁴ Relevant to the purpose of this Note, CEQ regulations do *not* require the use of cost–benefit analysis in EISs.⁸⁵ If a cost–benefit analysis *is* relied upon, however, it must be included in the EIS.⁸⁶

2. *GHG Reporting in Environmental Impact Statements.* — Having established the basics of the EIS requirement of NEPA, this section reviews the GHG reporting requirements under the statute. It is now firmly established that EISs must consider the effects of GHGs. The final sea shift came in the Ninth Circuit’s *Center for Biological Diversity v. NHTSA* decision.⁸⁷ In that case, the Ninth Circuit evaluated the NHTSA’s determination that its proposed Corporate Average Fuel Economy (CAFE) standards for light trucks and SUVs would have no significant impact on the environment and its decision to not evaluate the climate effects of the proposed standard in its NEPA review.⁸⁸ It determined that “[t]he impact of [GHG] emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.”⁸⁹ Ultimately, the court concluded that the NHTSA’s cursory assumption—that it was “self-evident” that the carbon emissions at stake were not environmentally significant—was supported by neither data nor analysis provided by the Agency.⁹⁰ Accordingly, the Ninth Circuit remanded to the NHTSA to prepare a revised EA, or a complete EIS if necessary, taking GHG effects into consideration.⁹¹

Under the Obama Administration, the CEQ issued final guidance on GHG reporting under NEPA, which declared that “[c]limate change is a fundamental environmental issue, and its effects fall squarely within NEPA’s purview.”⁹² The guidance recommended that agencies quantify direct and indirect GHG emissions,⁹³ and it directed agencies to a variety of quantification tools available in evaluating climate effects.⁹⁴ However,

83. See, e.g., *Sancho v. U.S. Dep’t of Energy*, 578 F. Supp. 2d 1258, 1266–68 (D. Haw. 2008) (holding DOE is not required to prepare an EIS for the construction and operation of the Large Hadron Collider because DOE contributed less than ten percent of the total cost and exercised minimal control).

84. 40 C.F.R. § 1508.27.

85. *Id.* § 1502.23.

86. *Id.*

87. 538 F.3d 1172, 1217 (9th Cir. 2008).

88. *Id.* at 1215.

89. *Id.* at 1217.

90. *Id.* at 1223.

91. *Id.* at 1227.

92. CEQ, GHG Final Guidance, *supra* note 15, at 2.

93. *Id.* at 4.

94. *Id.* at 12.

the guidance did *not* require the quantification of climate effects in all circumstances—it provided that when agencies do not quantify GHG emissions “because tools, methodologies, or data inputs are not reasonably available,” agencies should include a qualitative analysis and explain why the quantification is not reasonably available.⁹⁵ Significant for the purposes of this Note, the guidance did not require cost–benefit analysis in assessing GHG impacts, in conformity with CEQ regulations.⁹⁶ In Executive Order 13,783, President Trump ordered CEQ to rescind this final guidance.⁹⁷ Because federal agencies still have a duty to consider GHG emissions under NEPA,⁹⁸ however, the practical effect of this order on agencies’ NEPA analyses is yet to be seen.

3. *The SCC in NEPA Review.* — This section examines the cases that have addressed whether federal agencies should utilize the SCC in assessing the effects of GHG emissions under NEPA. Courts have only rarely entertained this question.⁹⁹ When they have, courts have almost universally rejected arguments that the relevant federal agency acted arbitrarily and capriciously by not utilizing the SCC in conducting its environmental review.

Just three weeks prior to the *Zero Zone, Inc.* decision, which upheld the use of the SCC in the regulatory cost–benefit analysis context,¹⁰⁰ the D.C. Circuit considered the applicability of the SCC in the NEPA context in *EarthReports, Inc. v. FERC*.¹⁰¹ This case concerned the adequacy of the Federal Energy Regulatory Commission’s (FERC) NEPA analysis for the approval of a liquefied natural gas import-export facility.¹⁰² Environmental plaintiffs challenged FERC’s approval, arguing that FERC’s EIS did not use the SCC in assessing indirect climate effects, and therefore failed to adequately consider the consequences of the project’s potential GHG emissions.¹⁰³

In its EIS, FERC acknowledged the existence of the SCC tool, but rejected using it in this particular instance, arguing that there was no consensus on the proper discount rate that should be used and citing uncertainties concerning the quantification of incremental climate impacts

95. *Id.* at 4.

96. *Id.* at 32; see also 40 C.F.R. § 1502.23 (2017). The guidance does suggest, though it does not require, that the SCC be used when cost–benefit analysis of GHGs is appropriate. CEQ, GHG Final Guidance, *supra* note 15, at 33 n.86.

97. See Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (Mar. 28, 2017).

98. See *supra* notes 87–91 and accompanying text.

99. To the author’s knowledge, the seven cases discussed in this section are the only reported cases that squarely address this issue.

100. *Zero Zone, Inc. v. U.S. Dep’t of Energy*, 832 F.3d 654, 677–80 (7th Cir. 2016).

101. 828 F.3d 949 (D.C. Cir. 2016).

102. *Id.* at 951–52.

103. *Id.* at 955–56.

from GHG emissions.¹⁰⁴ Ultimately, the court accepted these arguments, concluding that the plaintiffs' response that FERC "should have 'present[ed] values calculated with the full range of rates' or 'disclosed the limitations of the tool[,]'" belies their contention that the Commission acted unreasonably in finding the tool inadequately accurate to warrant inclusion under NEPA.¹⁰⁵ The court then asked whether another quantification metric could have been used¹⁰⁶ and, after accepting that no such tool existed, the court concluded that the petitioners had provided no compelling reason to doubt FERC's analysis.¹⁰⁷

The D.C. Circuit did not deviate from this approach in its recent *Sierra Club v. FERC* decision.¹⁰⁸ In that case, environmental plaintiffs challenged FERC's decision to approve the construction and operation of three natural-gas pipelines, arguing that FERC's EIS did not consider the downstream GHG emissions that will result from the combustion of the natural gas that the pipelines will transport.¹⁰⁹ While the court did conclude that FERC must give a quantitative estimate of downstream GHG emissions or specifically explain why it cannot do so,¹¹⁰ the court did *not* require that these emissions be monetized, or that the SCC be used.¹¹¹ Instead, the D.C. Circuit held only that FERC must explain, on remand, why the SCC was not useful in its NEPA review.¹¹² In so doing, the court explicitly left open the possibility of adopting the same reasoning employed in *EarthReports*.¹¹³

Other courts that have squarely addressed this issue have adopted a similar approach to that of the D.C. Circuit in *EarthReports*. In *WildEarth Guardians v. United States Forest Service*, environmental groups challenged the Bureau of Land Management and United States Forest Service's approval of two large coal mining projects partly located within the Thunder Basin National Grassland.¹¹⁴ The U.S. District Court for the District of Wyoming rejected the argument that NEPA required the

104. *Id.* at 956.

105. *Id.* (alteration in original) (citation omitted).

106. *Id.*

107. *Id.*

108. 867 F.3d 1357 (D.C. Cir. 2017).

109. *Id.* at 1365.

110. *Id.* at 1374.

111. *Id.* at 1375.

112. *Id.*

113. *Id.* ("On remand, FERC should explain in the EIS, as an aid to the relevant decisionmakers, whether the position on the Social Cost of Carbon that the agency took in *EarthReports* still holds, and why.").

114. 120 F. Supp. 3d 1237, 1245 (D. Wyo. 2015), rev'd on other grounds and remanded sub nom. *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 870 F.3d 1222 (10th Cir. 2017).

agencies to monetize the effects of GHG emissions from the project.¹¹⁵ The court further added that the uncertainty of the coal leasing program's effects on climate change meant that quantification was not feasible: "[T]he [climate] impacts of the proposed [coal] leases could not be reliably calculated with precision."¹¹⁶ Recently, the U.S. District Court for the District of New Mexico adopted a similarly deferential approach in a challenge to the NEPA review conducted for a mining plan modification at the El Segundo Mine in New Mexico.¹¹⁷

In one significant deviation from this approach, the U.S. District Court for the District of Colorado required the use of the SCC in an EIS for a coal mining project in western Colorado.¹¹⁸ In *High Country Conservation Advocates v. United States Forest Service*, the court found an EIS inadequate when it quantified the benefits of the project, but failed to quantify the costs associated with increased GHG emissions.¹¹⁹ In so doing, the court rejected an argument from the U.S. Forest Service that a standard methodology to quantify climate change effects was not presently available, finding "a tool is and was available"—the SCC.¹²⁰ Notably, however, the court did not hold that the Agency would have had to utilize the SCC in all EISs.¹²¹ The court merely found that the Agency's justification for not monetizing the costs of the project—that standardized tools to quantify the effects of GHG emissions were unavailable—was inadequate, particularly in light of the fact that the agency had utilized the SCC in its draft EIS.¹²²

Subsequent cases have interpreted the *High Country Conservation Associates* holding narrowly in line with the dominant approach represented by the D.C. Circuit's opinion in *EarthReports*. In *League of Wilderness Defenders/Blue Mountains Diversity Project v. Connaughton*, for instance, environmental groups challenged the U.S. Forest Service's decision to

115. *Id.* at 1271 ("[I]t is sufficient to demonstrate that GHG emissions were evaluated and attempts to quantify as a percentage of state and nationwide emissions were made.")

116. *Id.* at 1272. It is worth noting that the date of the EIS preparation did play some role in the court's decision. *Id.* at 1272–73. Still, the court found that "[e]ven if the analysis in the EIS was imperfect and could have been better . . . the agencies considered the effects of climate change, recognized benefits and costs of mining coal in the Wright area tracts." *Id.*

117. *WildEarth Guardians v. Jewell*, No. 1:16-CV-00605-RJ, 2017 WL 3442922, at *12 (D.N.M. Feb. 16, 2017) (upholding the decision to not use the SCC as being neither arbitrary nor capricious).

118. *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1192–93 (D. Colo. 2014).

119. *Id.* at 1191–92 ("Even though NEPA does not require a cost–benefit analysis, it was nonetheless 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 . . .").

120. *Id.* at 1190.

121. *Id.*

122. *Id.*

approve logging of old-growth forests in northeastern Oregon.¹²³ The plaintiffs challenged the adequacy of the Forest Service's EIS, arguing that because the Agency had quantified the benefits associated with the project, it should have also quantified the costs of utilizing the SCC.¹²⁴ The court distinguished the case from *High Country Conservation Advocates*, reasoning:

Here, the Forest Service did not rely on a tool to provide a quantitative analysis of the cost or benefit of the Project in relation to climate change because “there are a number of different views on the topic and still no clear science as to the effect of forest thinning projects and carbon storage.” Because there was no way to quantify the benefits or costs, the Forest Service did not selectively omit which data to share in the final EIS, as the agency did in *High Country*.¹²⁵

Consequently, the court approved the Agency's qualitative assessment of the project's GHG emissions.¹²⁶

A more recent case from the U.S. District Court of Montana—*Montana Environmental Information Center v. United States Office of Surface Mining*—however, adopted the partial reasoning advanced later in this Note¹²⁷ and found it arbitrary and capricious for the U.S. Office of Surface Mining and Enforcement (OSME) to not quantify the costs associated with GHG emissions when benefits had been monetized in its NEPA review of a federal mining plan modification.¹²⁸ Notably, however, the court's holding does not preclude the OSME, on remand, from using some quantification metric other than the SCC, assuming that it provides some justifiable reason for so doing.¹²⁹ In this way, the court's decision

123. No. 3:12-cv-02271-HZ, 2014 WL 6977611, at *1 (D. Or. Dec. 9, 2014).

124. *Id.* at *26.

125. *Id.* (citation omitted).

126. See *id.* at *27 (“Even if the Forest Service could have more explicitly acknowledged the potential short-term impacts of the Project on the forest's ability to store carbon, the failure to do so does not rise to the level of a NEPA violation.”).

127. See *infra* section II.A.2 (discussing how the *EarthReports* approach is inconsistent with NEPA).

128. *Mont. Env'tl. Info. Ctr. v. U.S. Office of Surface Mining*, CV 15-106-M-DWM, 2017 WL 3480262, *12–15 (D. Mont. Aug. 14, 2017) (“Defendants' contention that the Enforcement Office ‘conducted a full and thorough analysis of the greenhouse gas emission from the Mine’ may be sound But it sidesteps Plaintiff's argument, that it was arbitrary and capricious for the Enforcement Office to justify socioeconomic benefits while failing to quantify costs.” (citations omitted)).

129. See *id.* (resting its decision on the need to quantify costs, but not requiring use of the SCC in doing so).

does not necessarily advance the law beyond the Ninth Circuit's central holding in *Center for Biological Diversity v. NHTSA*.¹³⁰

In sum, courts have adopted a highly deferential approach in addressing whether federal agencies are required to utilize the SCC in conducting their EISs. In so doing, courts have expressly and implicitly accepted the argument that the SCC is too imprecise and involves too much uncertainty to warrant inclusion in the NEPA review process—despite the fact that the federal government has embraced and the Seventh Circuit has unambiguously blessed the use of the SCC in the regulatory cost–benefit analysis context.

II. THE CO₂ MONETIZATION GAP

The divergence of approaches in evaluating the effects of GHG emissions in the regulatory cost–benefit and the NEPA-review contexts has resulted in what this Note labels the “CO₂ monetization gap.” Because NEPA covers a broader range of federal activities than does the regulatory cost–benefit analysis mandate, federal agencies are not currently required to consider the monetized effects of GHG emissions associated with a slew of federal projects, policies, financing activities, and permitting decisions, which do not go through the rulemaking process but may have significant environmental consequences.¹³¹ The effect of this lapse in the GHG reporting regime is significant. Since 2009, for instance, Ex-Im has financed seventy fossil-fuel projects, resulting in annual CO₂ emissions of 164 million metric tons.¹³² Ex-Im does not utilize the SCC in its environmental reports, despite evidence that such activities come at massive costs to American citizens and the world at large.¹³³

This Part explores the consequences of the CO₂ monetization gap in greater depth. Section II.A argues that the divergent approaches used in the NEPA and regulatory cost–benefit contexts are jurisprudentially inconsistent and the approach in assessing agencies' environmental im-

130. 538 F.3d 1172, 1198–203 (9th Cir. 2008) (finding it arbitrary and capricious to not monetize the costs associated with setting a national fuel-economy standard when the economic benefits of the standard had been quantified).

131. See *supra* notes 24–25 and accompanying text (describing the requirement that federal agencies conduct cost–benefit analyses before proposing new regulations); *supra* notes 81–86 and accompanying text (describing the federal activities covered by NEPA).

132. Asaf Shalev, Michael Phillis, Elah Feder & Susanne Rust, How Obama's Climate Change Legacy Is Weakened by US Investment in Dirty Fuel, *Guardian* (Nov. 30, 2016), <http://www.theguardian.com/environment/2016/nov/30/us-fossil-fuel-investment-obama-climate-change-legacy> [<http://perma.cc/338S-D4P2>] (explaining such emissions are equivalent to the “95 currently operating coal-fired power plants in Ohio, Pennsylvania and Oklahoma”).

133. See *infra* sections II.B.2–3 (applying the SCC to the financing activities of Ex-Im).

pact statements runs counter to the goals of NEPA. Section II.B utilizes a case study—the financing activities of Ex-Im—to illustrate how the CO₂ monetization gap has undermined the information-forcing objectives of NEPA and has contributed to suboptimal decisionmaking.

A. *Tension in the Federal Approaches to Analyzing the Effects of GHG Emissions*

Divergent approaches in courts' assessments of regulatory cost-benefit analyses and environmental impact statements under NEPA have created considerable tension in the law with respect to how agencies should analyze the GHG emissions associated with their actions. Section II.A.1 argues that courts' rejection of the SCC in NEPA review, best exemplified by the D.C. Circuit's opinion in *EarthReports*, is jurisprudentially inconsistent with the treatment of climate change in the regulatory cost-benefit context and courts' handling of uncertainty in other environmental situations. Section II.A.2 then argues that courts' treatment of the SCC under NEPA is inconsistent with the aims of NEPA and existing NEPA jurisprudence.

1. *Inconsistent Approaches in Assessing GHG Emissions.* — In both the regulatory cost-benefit and NEPA-review contexts, the federal government is tasked with fundamentally the same duty: to quantify the effects of GHGs in a manner that allows for a meaningful analysis of the merits and demerits of a proposed regulation and government action, respectively. Neither mandate explicitly requires the monetization of environmental consequences. The text of Executive Order 13,563 states that “[w]here appropriate and permitted by law, each agency may consider (and discuss qualitatively) values that are difficult or impossible to quantify.”¹³⁴ Further, CEQ regulations do not require cost-benefit analysis for NEPA review.¹³⁵

It is surprising then that courts have come to strikingly different conclusions as to whether the SCC should be used to conduct environmental reviews of proposed government actions in the regulatory cost-benefit and NEPA-review contexts. In *Zero Zone, Inc.*, the Seventh Circuit dismissed arguments that reliance on the SCC in developing energy efficiency standards for commercial refrigeration units was arbitrary and capricious, finding that the selection of damage factors, discount rates, and its inclusion of global climate costs were reasonable.¹³⁶ Just three weeks before this decision, the D.C. Circuit reached a decision in *EarthReports* largely at odds with the court's decision in *Zero Zone, Inc.*

134. Exec. Order No. 13,563, 3 C.F.R. 215, 216 (2012).

135. 40 C.F.R. § 1502.23 (2016).

136. See *supra* section I.A.3 (discussing the *Zero Zone, Inc.* decision).

when it accepted FERC's argument that the SCC is too imprecise and entails too much uncertainty to warrant inclusion in NEPA review.¹³⁷

It is, of course, important to note that the Seventh Circuit's finding that it was not arbitrary and capricious for DOE to rely upon the SCC in performing its cost-benefit analysis does not logically imply that it would have been arbitrary and capricious for DOE to *not* consider the SCC in its cost-benefit analysis. Nor does it imply that it would be arbitrary and capricious for an agency to *not* consider the SCC when evaluating climate effects in other circumstances. An agency, for instance, may have a principled reason why monetization, and therefore utilization of the SCC, is not appropriate in a particular instance, and the Seventh Circuit's decision in *Zero Zone, Inc.* does not foreclose that possibility. However, FERC's rationale in *EarthReports*, which the court accepted, did not rest on such a reason—instead, it questioned the validity of the SCC altogether by highlighting the range of discount rates available and the inherent uncertainty involved in assigning damage-function values in the monetization process.¹³⁸ This reasoning is, therefore, fundamentally at odds with the Seventh Circuit's approach in *Zero Zone, Inc.*

The D.C. Circuit's approach in *EarthReports* is also inconsistent with how courts have dealt with uncertainty in other environmental contexts. The court's concern regarding the unreliability involved in applying the SCC did not address the obvious response that cost-benefit analyses that monetize environmental impacts will *always* involve these uncertainties, particularly with respect to the discount rates employed.¹³⁹ Despite the inherent uncertainty involved in this process, courts, including the D.C. Circuit, have consistently accepted a reasoned selection of a discount rate or the use of multiple discount rates in cost-benefit analyses involving environmental impacts and, in some instances, courts have even *required* the use of multiple discount rates in the preparation of EISs.¹⁴⁰ Thus, the

137. See *supra* notes 100–107 and accompanying text (discussing the *EarthReports* decision).

138. See *supra* notes 100–107 and accompanying text (discussing the *EarthReports* decision).

139. See M. Michael Egan, Jr., Note, Cost-Benefit Analysis in the Courts: Judicial Review Under NEPA, 9 Ga. L. Rev. 417, 422–25 (1975) (arguing there is “no widespread agreement among economists as to the appropriate discount rate” to be used in assessing environmental projects); see also, e.g., Nicholas Stern, The Stern Review: The Economics of Climate Change 31–33 (2006) (justifying the use of a near-zero discount rate); William D. Nordhaus, A Review of the *Stern Review on the Economics of Climate Change*, 45 J. Econ. Literature 686, 689–701 (2007) (critiquing the low discount rate used by Nicholas Stern in his attempt to assign a cost to carbon dioxide emissions).

140. See, e.g., *Nat. Res. Def. Council, Inc. v. Hodel*, 865 F.2d 288, 311 (D.C. Cir. 1988) (upholding the Secretary of Interior's use of multiple discount rates in an analysis of energy consumption projections in an EIS); *Johnston v. Davis*, 698 F.2d 1088, 1094–95 (10th Cir. 1983) (finding that an EIS improperly made no mention of an artificially low discount rate and requiring inclusion of a higher discount rate as a means of comparison).

dominant judicial reasoning, as exemplified by *EarthReports*, is fundamentally at odds with the treatment of uncertainty in environmental cost–benefit analyses more generally.

2. *Defying the Aims of NEPA and Existing NEPA Jurisprudence.* — The courts’ approach in the NEPA context is also inconsistent with the fundamental aims of NEPA and preexisting jurisprudence. NEPA’s environmental reporting mandate has two main purposes: (1) to ensure that federal actors take into consideration the present and future consequences of their decisions and (2) to meaningfully inform other government actors and the public of a government action’s environmental consequences.¹⁴¹ In fulfilling these aims, NEPA does not require that agencies use a specific type of environmental review or analysis,¹⁴² nor does it require a formal cost–benefit analysis.¹⁴³ However, “[i]f an alternative mode of EIS evaluation is insufficiently detailed to aid the decision-makers in deciding whether to proceed, or to provide the information the public needs to evaluate the project effectively, then the absence of a numerically expressed cost–benefit analysis may be fatal.”¹⁴⁴

There is good reason to believe that NEPA’s current GHG reporting regime is not sufficiently detailed to meaningfully inform decisionmakers and the public of the environmental consequences at stake when proposed projects will emit large amounts of GHG emissions. Unlike the proposed clear-cutting of a forest or the construction of a hydroelectric dam, a government proposal that would result in a marginal increase in GHG emissions does not immediately elicit tangible conceptions of environmental harm.¹⁴⁵ Further, given the ubiquitous nature of GHGs and the global and temporal scale of climate change, it is conceptually

141. See *supra* note 75 and accompanying text (discussing the two purposes of NEPA).

142. See, e.g., *Lands Council v. McNair*, 629 F.3d 1070, 1081 (9th Cir. 2010) (finding the Forest Service was not required to use a specific methodology in analyzing wildlife population dynamics); *Sierra Club v. U.S. Army Corps of Eng’rs*, 701 F.2d 1011, 1035 (2d Cir. 1983) (holding that an EIS would not necessarily fail if “reasonable investigative efforts” had used less accurate data than were available).

143. 40 C.F.R. § 1502.23 (2016).

144. *Columbia Basin Land Prot. Ass’n v. Schlesinger*, 643 F.2d 585, 594 (9th Cir. 1981).

145. See, e.g., Shahzeen Z. Attari et al., *Public Perceptions of Energy Consumption and Savings*, 107 *Proc. Nat’l Acad. Sci. U.S.* 16,054, 16,054, 16,058–59 (2010) (documenting systemic underestimation of energy usage among consumers and attributing this to various cognitive failures and a lack of concern about energy conservation); Thomas Dietz, *Understanding Environmentally Significant Consumption*, 111 *Proc. Nat’l Acad. Sci. U.S.* 5067, 5068 (2014) (explaining misperceptions about energy use are “systemically biased” because measurements of energy units are generally unfamiliar to the public and electricity consumption is relatively invisible compared to other forms of resource consumption); cf. Irene Lorenzoni et al., *Barriers Perceived to Engaging with Climate Change Among the UK Public and Their Policy Implications*, 17 *Global Env’tl. Change* 445, 454 (2007) (explaining climate change skepticism may be enhanced due to climate change’s complexity, scale, and “hidden” nature).

difficult to appreciate the climate effects of a given project without monetization.¹⁴⁶ Is a project in the public interest if it will decrease energy costs by one cent per kilowatt-hour for New York residents, but also cause a net increase in emissions of two million tons of CO₂ per year? What if the project increases net annual emissions by four million tons of CO₂ per year? The current approach, by requiring only a general consideration of GHG emissions in the NEPA context, does not allow for a meaningful or reasoned way to answer such questions.¹⁴⁷

This critique is particularly relevant to projects and government programs that are justified on economic grounds and the monetary costs associated with GHG emissions are not considered. Courts have recognized that misleading economic assumptions can undermine the purpose of NEPA review since “[t]he use of inflated economic benefits . . . may result in approval of a project that otherwise would not have been approved because of its adverse environmental effects. Similarly, misleading economic assumptions can also defeat the . . . function of an EIS by skewing the public’s evaluation of a project.”¹⁴⁸ Yet, by wholesale rejecting a requirement to use the SCC in the NEPA-review context, courts have implicitly sanctioned the use of misleading economic assumptions to justify federal projects. As will be discussed at greater length in section II.B, the climate costs associated with some federal programs that fall within the CO₂ monetization gap are quite high.¹⁴⁹ By allowing agencies to ignore these costs, courts have licensed agencies to impermissibly inflate the economic benefits of certain projects, undermining the very purposes of NEPA.

Lastly, the deferential posture courts have adopted in reviewing the use of the SCC in the NEPA context is arguably inconsistent with the typical role of courts in reviewing EISs and EAs. While NEPA does not require that agencies prioritize environmental considerations,¹⁵⁰ NEPA does require that agencies take a “hard look” at environmental consequences before undertaking major federal actions.¹⁵¹ Further, the arbitrary and capricious standard of review does not grant agencies a free pass to

146. See *supra* note 145; see also Revesz & Livermore, *supra* note 24, at 100, 108–09 (explaining the benefits of climate controls accrue primarily to future generations).

147. Cf. Lorenzoni et al., *supra* note 145, at 455 (explaining that communicating the effects of climate change can be improved by translating those effects into monetary terms).

148. *Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 446 (4th Cir. 1996); see also *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1182 (D. Colo. 2014) (“[W]here [cost–benefit] analysis is included it cannot be misleading.”).

149. See *infra* section II.B.3 (applying the SCC to Ex-Im’s activities).

150. *Strycker’s Bay Neighborhood Council v. Karlen*, 444 U.S. 223, 227–28 (1980) (explaining NEPA “requires no more” than conformity with “NEPA’s procedural requirements” and consideration of the “environmental consequences”).

151. *Balt. Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983).

ignore environmental risks: “[C]ourts must independently review the record in order to satisfy themselves that the agency has made a reasoned decision based on its evaluation of the evidence.”¹⁵² The SCC considers many of the indirect effects associated with GHG emissions,¹⁵³ identifying and aggregating environmental risks that a mere reporting of annual GHG emissions or a qualitative assessment of climate effects would not otherwise capture. By allowing agencies to provide only a cursory examination of the climate effects of a proposed action despite the availability of a more nuanced analytical tool, courts have allowed agencies to systematically ignore evidence of environmental risks in violation of this “hard look” requirement.

In short, the courts’ divergence in approaches in the regulatory cost–benefit and NEPA-review contexts has led to a series of legal inconsistencies that courts have yet to reconcile. The rationale used to reject the SCC in the NEPA context is in direct conflict with the Seventh Circuit’s holding in *Zero Zone, Inc.* Further, this approach clashes with courts’ traditional treatment of uncertainty in other environmental contexts. Lastly, the rejection of the SCC in the NEPA-review setting conflicts with NEPA’s aims of ensuring that public officials meaningfully consider environmental consequences and inform the public of environmental costs associated with federal proposals.

B. *The Effects of the CO₂ Monetization Gap: Climate Change Disclosures of the Export-Import Bank of the United States*

This section examines the practical consequences of the CO₂ monetization gap, using Ex-Im’s investment activities as an illustration. Ex-Im is subject to NEPA,¹⁵⁴ but is not subject to the Executive Order 13,563 cost–benefit mandate.¹⁵⁵ Accordingly, the Bank does not use the SCC to

152. *Earth Island Inst. v. U.S. Forest Serv.*, 351 F.3d 1291, 1301 (9th Cir. 2003) (citing *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 377 (1989)); see also *Balt. Gas & Elec. Co.*, 462 U.S. at 105 (“Our only task is to determine whether the Commission has considered the relevant factors and articulated a rational connection between the facts found and the choice made.”).

153. See *supra* notes 29–30 and accompanying text (discussing SCC’s inclusion of indirect climate effects). CEQ regulations require consideration of indirect environmental effects. 40 C.F.R. § 1508.25 (2016).

154. See *infra* notes 162–171 and accompanying text (discussing the applicability of NEPA to Ex-Im activities).

155. By its own terms, Executive Order 13,563 applies only to agency regulations. See Exec. Order No. 13,563, 3 C.F.R. 215, 215 (2012) (“[E]ach agency must . . . propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs[,] . . . tailor its regulations to impose the least burden on society, . . . [and] select . . . those approaches that maximize net benefits . . .”). Similarly, President Clinton’s Executive Order 12,866, to which Executive Order 13,563 alludes, is limited to the promulgation of regulations. See Exec. Order No. 12,866, 3 C.F.R. 638, 638–39 (1994) (“Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need . . .”).

analyze the climate effects of its activities. However, as this Note will show, Ex-Im's investment activities have profound environmental consequences, resulting in great expense to the American public¹⁵⁶ and undermining the United States' ability to address climate change. Section II.B.1 provides an introduction to Ex-Im and its role in financing carbon-intensive projects abroad. Section II.B.2 then examines the adequacy of Ex-Im's GHG disclosures. Finally, section II.B.3 applies the SCC to Ex-Im's investment activities.

1. *An Introduction to the Export-Import Bank of the United States.* — Ex-Im is an independent federal agency with a mission of “supporting American jobs by facilitating the export of U.S. goods and services.”¹⁵⁷ The Bank supports projects that the private sector would otherwise be unwilling to finance by taking on relatively risky ventures, backed by the credit of the United States.¹⁵⁸ Ex-Im supports such projects through the provision of “export credit insurance, working capital guarantees, and guarantees of commercial loans to foreign buyers.”¹⁵⁹

Ex-Im's operations have profound environmental consequences. During Obama's presidency, Ex-Im provided nearly \$34 billion in low-interest loans and financing for projects that will emit 164 million metric tons of carbon dioxide per year.¹⁶⁰ In 2011 alone, the Bank authorized \$4.9 billion in financing for fossil-fuel power, exploration, production, and transportation projects, which will produce sixty-eight million metric tons of CO₂ per year.¹⁶¹

[A]gencies should assess all costs and benefits of available regulatory alternatives”). Executive Order 12,866 defines a “regulation” as “an agency statement of general applicability and future effect, which the agency intends to have the force and effect of law, that is designed to implement, interpret, or prescribe law or policy or to describe the procedure or practice requirements of an agency.” *Id.* at 641. Due to the limited scope of Executive Orders 13,563 and 12,866, other federal activities that fall within the CO₂ monetization gap include agency adjudications, such as federal permit approvals for GHG-intensive activities. One noteworthy area of federal activity that falls within the CO₂ monetization gap is the federal leasing program for fossil-fuel mining and extraction. See Michael Burger & Jessica Wentz, *Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review*, 41 *Harv. Envtl. L. Rev.* 109, 116–19, (2017) (providing an overview of the federal fossil-fuel leasing program). The program has profound implications for the United States' carbon footprint. See *id.* at 122–24 (noting that the Environmental Protection Agency (EPA) estimates of the program's impact do not include “downstream” emissions, and providing various estimates of the program's climate impacts).

156. See *infra* section II.B.3.

157. Exp.-Imp. Bank of the U.S., *About Us*, *supra* note 17.

158. *Id.*

159. Ex-Im Bank: *What We Do*, Exp.-Imp. Bank of the U.S., <http://www.exim.gov/what-we-do> [<http://perma.cc/DYF3-2WUK>] (last visited Oct. 12, 2017).

160. Shalev et al., *supra* note 132.

161. 2011 Ex-Im Annual Report, *supra* note 18, at 20 (listing Ex-Im's energy projects and their predicted emissions). In 2012, Ex-Im provided \$9.636 billion in financing for fossil-fuel projects, resulting in annual emissions of 22.9 million metric tons of carbon

Though it was initially unclear whether NEPA applies to the activities of Ex-Im, the Bank is currently operating as if it is bound by NEPA's environmental-reporting requirements.¹⁶² In *Friends of the Earth v. Watson*,¹⁶³ environmental groups alleged that the Overseas Private Investment Corporation (OPIC)¹⁶⁴ and Ex-Im had financially supported projects contributing to climate change without complying with NEPA.¹⁶⁵ On motion for summary judgment, Judge White concluded that OPIC is subject to NEPA because the record did not evince a congressional intent for OPIC's statute to displace NEPA.¹⁶⁶ The court, however, did not decide whether the particular projects at issue required environmental impact statements because it could not conclude as a matter of law that they were "major federal action[s]."¹⁶⁷

Ultimately, the parties settled the case, with Ex-Im agreeing to adopt climate change reporting measures that broadly comply with NEPA's mandates.¹⁶⁸ The Bank agreed to provide, "for all financing applications

dioxide. 2012 Exp.-Imp. Bank of the U.S. Ann. Rep. 26 [hereinafter 2012 Ex-Im Annual Report]. In 2013, Ex-Im reported financing projects that will emit 31.54 million metric tons of carbon dioxide per year. 2013 Exp.-Imp. Bank of the U.S. Ann. Rep. 26 [hereinafter 2013 Ex-Im Annual Report].

162. See Settlement Agreement at 1, *Friends of the Earth, Inc. v. Spinelli*, No. 02-4106 (N.D. Cal. filed Feb. 6, 2009) [hereinafter Ex-Im, Settlement Agreement], http://blogs2.law.columbia.edu/climate-change-litigation/wp-content/uploads/sites/16/case-documents/2009/20090206_docket-02-04106_settlement-agreement.pdf [<http://perma.cc/26U9-997N>] (outlining CO₂ reporting requirements and explaining Ex-Im's NEPA obligation to determine whether NEPA review is necessary for each proposed project).

163. *Friends of the Earth, Inc. v. Watson, Inc.*, No. C 02-4106 JSW, 2005 WL 2035596 (N.D. Cal. Aug. 23, 2005). The case was later renamed *Friends of the Earth, Inc. v. Mosbacher*, see 488 F. Supp. 2d 889 (N.D. Cal. 2007), and then *Friends of the Earth, Inc. v. Spinelli*, see Ex-Im, Settlement Agreement, *supra* note 162, at 1.

164. OPIC advances foreign policy and security interests through foreign development projects. Who We Are, OPIC, <http://www.opic.gov/who-we-are/overview> [<http://perma.cc/UTA3-SA3A>] (last visited Oct. 12, 2017).

165. *Friends of the Earth*, 2005 WL 2035596, at *1.

166. *Id.* at *8. It appears that Ex-Im did not argue that its foreign financing projects were categorically exempt from NEPA, as did OPIC, and instead rested its argument on standing and finality grounds. Defendants' Motion for Summary Judgment and Memorandum in Support at 1–2, *Friends of the Earth*, No. C 02-4106 JSW (N.D. Cal. 2005), 2004 WL 5584706. The court later reaffirmed its earlier holding regarding the applicability of NEPA to these activities. See *Friends of the Earth*, 488 F. Supp. 2d at 906–08 (reviewing the evidence and concluding that "it does not, as a matter of law, establish that Congress was aware of OPIC's view that it is not subject to NEPA and that Congress acquiesced in that view").

167. See *Friends of the Earth*, 488 F. Supp. 2d at 918 ("[T]he Court finds that Plaintiffs have failed to show, as a matter of law, that any of the projects identified . . . qualify as major federal action.").

168. Ex-Im, Settlement Agreement, *supra* note 162, at 1. Ex-Im's Environmental and Social Impact Assessment (ESIA) Reports operate somewhat analogously to environmental assessments under NEPA. Compare 40 C.F.R. § 1508.9 (2016) (providing the requirements of the environmental assessment), with Environmental Impact Assessment Reports, Exp.-Imp. Bank of the U.S., <http://www.exim.gov/policies/ex-im-bank-and-the-environment/>

submitted . . . to the Ex-Im Bank Board of Directors ('Board'), information about carbon dioxide ('CO₂') emissions as part of and for consideration in conjunction with Ex-Im Bank's decision whether or not to approve transactions related to fossil fuel projects."¹⁶⁹ In addition, the Bank must state whether NEPA review is necessary for each project and provide a rationale for such a determination at least thirty days in advance of any decision by the Board.¹⁷⁰ The settlement also requires that the Bank post environmental review documents and provide annual CO₂ emissions estimates.¹⁷¹

2. *Export-Import Bank Climate Disclosures Under NEPA.* — This section examines the adequacy of Ex-Im's climate change disclosures,¹⁷² considering NEPA's twin aims of ensuring agencies carefully consider significant environmental impacts and provide relevant information to the public.¹⁷³ The analysis of several of Ex-Im's climate disclosures reveals the practical consequences of the CO₂ monetization gap and the current approach's shortcomings in fulfilling the information-forcing purpose of NEPA.

environmental-impact-assessment-reports [<http://perma.cc/3G46-TFMU>] [hereinafter Ex-Im, Environmental Impact Assessment Reports] (last visited Oct. 12, 2017) (giving the components of a typical ESIA report). For a lengthier discussion of these disclosures, see *infra* note 172.

169. Ex-Im, Settlement Agreement, *supra* note 162, at 1.

170. *Id.* For NEPA reporting requirements, see *supra* sections I.B.1–2.

171. Ex-Im, Settlement Agreement, *supra* note 162, at 1–2.

172. Ex-Im found no relevant documents in response to this author's Freedom of Information Act request for all environmental assessments and impact statements prepared for Ex-Im Category A projects from 2012 to 2016. Letter from David M. Sena, Chief FOIA Officer, Exp.-Imp. Bank of the U.S., to author (Feb. 8, 2017) (on file with the *Columbia Law Review*) (regarding FOIA Request # 201700034F). Indeed, it appears that Ex-Im takes the dubious position that many of its projects are not "major federal actions" and are, therefore, not subject to NEPA review. See Pending Transactions, Exp.-Imp. Bank of the U.S., <http://www.exim.gov/policies/ex-im-bank-and-the-environment/pending-transactions> [<http://perma.cc/DA86-ATET>] (last visited Oct. 13, 2017) (listing pending projects and the need for further NEPA review). Rather than provide full environmental impact statements or assessments, Ex-Im has elected to provide environmental and social impact assessment reports, which function somewhat analogously to environmental assessments. See *supra* note 168 (comparing ESIA reports with the NEPA environmental assessment requirement). A complete discussion of whether these projects are major federal actions requiring NEPA review and whether these reports satisfy Ex-Im's obligations under NEPA is beyond the scope of this Note, though the author notes that Ex-Im's environmental reporting practices are of questionable legal sufficiency. However, for the purpose of the more limited discussion here, this Note treats the environmental and social impact assessment reports as functionally equivalent to environmental assessments under NEPA and assumes that they otherwise comply with the NEPA reporting requirements that are laid out in sections I.B.1–2.

173. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

An examination of Ex-Im's ESIA for a liquefied natural gas (LNG) production–export facility in Queensland, Australia is illuminating.¹⁷⁴ The Curtis Queensland LNG Project is one of Australia's largest capital investments and its ESIA incorporates a number of economic benefits associated with the project, including the creation of more than 4,000 jobs during construction, 1,000 permanent jobs upon completion, and \$32 billion in economic growth.¹⁷⁵ The ESIA also reports that the project will emit approximately ninety-five million tons of carbon dioxide equivalent (CO_{2e}) over the course of its lifetime, but the report includes no economic analysis of the consequences of these GHG emissions.¹⁷⁶ Additionally, the CO_{2e} figure does not factor downstream emissions resulting from the subsequent consumption of the liquefied natural gas¹⁷⁷—emissions that could be far more significant than those associated with the construction and actual operation of the facility.¹⁷⁸

An ESIA for a proposed LNG extraction, refinement, and transportation complex in Cabo Delgado, Mozambique similarly extolls the economic benefits of the project while only cursorily considering its projected GHG emissions. The report describes the project as representing an investment of up to \$25 to 30 billion—“potentially the largest investment project in Mozambique to date.”¹⁷⁹ Economic benefits include “a significant increase in the GDP” and increased government revenue through royalty, tax, and equity gas rights, which could “improve the health, education and quality of life of the people of Mozambique.”¹⁸⁰ At the same time, the report only nominally considers the climate effects of the project. The report indicates that the project will emit approximately thirteen million tons of carbon dioxide per year during full operation in

174. Note that this ESIA was prepared by QGC Limited to comply with the environmental review requirements of the Australia and Queensland governments. Preface to QGC Ltd. et al., *Queensland Curtis LNG*, EIS 1 (2009). Ex-Im did not provide any other environmental impact report related to the project. See Approved Transactions, Exp-Imp. Bank of the U.S., <http://www.exim.gov/policies/exim-bank-and-environment/Environmental-Category-A-and-B-Approved-Transactions> [<http://perma.cc/73KR-KFBS>] (last updated Oct. 12, 2016) (listing available environmental review documents).

175. 1 QGC Ltd. et al., *Queensland Curtis LNG*, EIS § 2, at 1 (2009); 8 QGC Ltd. et al., *Queensland Curtis LNG*, EIS § 10.4, at 9–10, 18 (2009).

176. 7 QGC Ltd. et al., *Queensland Curtis LNG*, EIS § 2.3, at 9 (2009).

177. See *id.* at 6–9 (providing only estimated emissions from the construction and operation of the facility).

178. See Elizabeth Sheargold & Smita Walavalkar, *NEPA and Downstream Greenhouse Gas Emissions of U.S. Coal Exports* 21 (2013) (arguing the downstream effects of coal export projects will more significantly impact the climate than the operation of the projects); Burger & Wentz, *supra* note 155, at 122–24 (arguing the downstream effects of fossil fuels extracted from federal lands are significant and should be included in the NEPA review process).

179. 2 Anadarko, *Environmental Impact Assessment Report for the Liquefied Natural Gas Project in Cabo Delgado* § 15.1.1, at 15-2 (2014).

180. *Id.*

2022, increasing Mozambique's national GHG emissions by more than nine percent.¹⁸¹ The report does not consider the environmental ramifications of the proposal's GHG emissions in global or monetary terms,¹⁸² nor does it discuss the downstream effects of increased fossil-fuel consumption resulting from the project.¹⁸³

The reporting of GHG emissions in this way has significant consequences for the American public, host countries, and for the global community at large. While the development goals of the Queensland and Mozambique projects are laudable, the decision to not monetize GHG emissions associated with these enterprises is troubling, especially considering Mozambique's particular "vulnerability to climate related events"¹⁸⁴ and climate change's predicted impacts on Queensland's coastal communities.¹⁸⁵ The economic benefits of these projects must be meaningfully compared with the corresponding climate costs in order to truly analyze development effects and assess whether a project will have net positive economic impacts. Moreover, without utilizing the SCC, these reports provide no meaningful way for the American public to assess whether the export benefits that accrue from these ventures are worth their corresponding GHG emissions.

3. *Applying the SCC to the Activities of the Export-Import Bank.* — This section explores the consequences of the CO₂ monetization gap as applied more generally to Ex-Im's activities. The application of the SCC is particularly appropriate in this context because the Bank's activities are justified in economic terms.¹⁸⁶ Further, the bulk of the annual emissions that result from the Bank's activities generally stems from a small number of very large, carbon-intensive projects.¹⁸⁷ Yet, the Bank's annual reports only cursorily consider annual GHG emissions, and individual project environmental assessments do not use the SCC.¹⁸⁸

In 2011, Ex-Im estimates that it supported \$41 billion in American exports and 290,000 American jobs at no expense to the American

181. *Id.* § 12.3.2, at 12-4 tbl.12.7.

182. See *id.* at 12-6 ("Although the greenhouse effect is transboundary and global emissions are directly affected, this work assesses the impact on Mozambique's GHG emissions.").

183. *Id.* at 12-6 n.1 (noting that the report only considers LNG processing activities).

184. See, e.g., Project—Climate Change Adaptation in Mozambique, Food & Agric. Org. of the United Nations, <http://www.fao.org/climatechange/77271/en/> [<http://perma.cc/6TYJ-R4JP>] (last updated Feb. 18, 2013).

185. See, e.g., Climate Change Impacts in Queensland, Austl. Gov't Dep't of the Env't & Energy, <http://www.environment.gov.au/climate-change/climate-science/impacts/qld> [<http://perma.cc/L8DA-WNB9>] (last visited Oct. 13, 2017).

186. See *supra* section II.A.2 (discussing the inconsistency of not applying the SCC when projects are justified on economic grounds).

187. See, e.g., 2012 Ex-Im Annual Report, *supra* note 161, at 26 (describing the carbon-intensive activities of the Bank in 2012).

188. See *id.* (considering climate effects only in a general manner).

taxpayer.¹⁸⁹ That same year, however, Ex-Im generated \$4.9 billion in U.S. exports associated with fossil-fuel projects projected to produce sixty-eight million tons of CO₂ per year.¹⁹⁰ Applying the SCC and employing a 3% discount rate, these emissions come at an annual cost of almost \$2.5 billion in 2015 dollars.¹⁹¹ Making the modest assumption of a twenty-year lifespan for these projects, they come at a cost of \$56.3 billion,¹⁹² eclipsing the value of both the exports generated by these projects and all Ex-Im activities in 2011. Because this estimate does not include all the downstream climate effects associated with these projects,¹⁹³ this figure likely far underrepresents the true costs at stake.

This analysis indicates that Ex-Im's current GHG reporting approach does not adequately fulfill NEPA's goal of ensuring that decisionmakers meaningfully consider the environmental consequences of the Bank's financing activities.¹⁹⁴ Ex-Im's fossil-fuel financing activities come at an extreme cost to American citizens, suggesting that welfare would be improved by shifting resources toward less carbon-intensive investments. Yet, Ex-Im continues to invest heavily in fossil-fuel projects abroad.¹⁹⁵

Moreover, there is no evidence that the settlement agreement reached in *Friends of the Earth*, requiring reporting of GHG emissions and compliance with NEPA,¹⁹⁶ has resulted in improved decisionmaking.¹⁹⁷ In 2008 and 2009, Ex-Im estimated that its financing activities would produce 5.1 and 17.9 million metric tons of CO₂ per year, respectively.¹⁹⁸ In 2010, after the settlement agreement took effect, Ex-Im projected that its

189. 2011 Ex-Im Annual Report, *supra* note 18, at 4.

190. *Id.* at 20 (stating that \$3.2 billion was spent on fossil-fuel development, production, and refinement projects and \$1.7 billion was spent on fossil-fuel power plants). This figure does not seem to contemplate downstream GHG emissions from fossil-fuel extraction, production, and transmission projects, *id.*, suggesting that the actual annual emissions could be much higher, see Burger & Wentz, *supra* note 155, at 122–24.

191. These calculations assume emissions of sixty-eight million tons of CO₂ annually in years 2012 through 2031 and utilize the SCC's per-metric-ton-of-CO₂ price estimates of \$36 in years 2012 through 2019, \$42 in years 2020 through 2024, \$46 in years 2025 through 2029, and \$50 in years 2030 through 2031. See EPA, SCC Fact Sheet, *supra* note 30, at 4 (providing SCC figures for 2015 to 2050).

192. EPA, SCC Fact Sheet, *supra* note 30, at 4. For calculations, see *infra* note 191.

193. See *supra* note 190.

194. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) (describing NEPA's twin aims).

195. See, e.g., 2013 Ex-Im Annual Report, *supra* note 161, at 26 (discussing the 31.4 annual tons of carbon-dioxide emissions resulting from Ex-Im projects).

196. See *supra* section I.B.1 (describing Ex-Im's NEPA obligations).

197. It should be noted that the settlement agreement did require Ex-Im to adopt a carbon policy aimed at incentivizing carbon reductions. See Ex-Im, Settlement Agreement, *supra* note 162, at 2–3.

198. See 2009 Exp.-Imp. Bank of the U.S. Ann. Rep. 11 (discussing carbon-dioxide emissions associated with energy projects financed by the Bank); 2008 Exp.-Imp. Bank of the U.S. Ann. Rep. 15 (same).

financing activities for the year would produce 20.46 million metric tons of CO₂ annually.¹⁹⁹ Carbon-intensive investment continued to rise in subsequent years: In 2011, 2012, and 2013, Ex-Im predicted its foreign projects would emit 68, 22.9, and 31.54 million metric tons of CO₂ per year, respectively.²⁰⁰

Far from fulfilling the twin aims of NEPA, these toothless climate disclosures reveal that the CO₂ monetization gap has resulted in a climate reporting regime that fails to adequately inform the public or to ensure that agency officials sufficiently consider the costs associated with GHG emissions. In this way, the CO₂ monetization gap has contributed to sub-optimal decisionmaking, threatening the United States' ability to address global climate change.²⁰¹

III. FIXING THE CO₂ MONETIZATION GAP

After considering the CO₂ monetization gap and its consequences in Part II, this Part offers a way forward. As a threshold matter, the relevance of the social cost of carbon must be addressed given the Trump Administration's open hostility toward the tool and to environmental regulation more generally.²⁰² Indeed, on March 28, 2017, President Trump

199. See 2010 Exp.-Imp. Bank of the U.S. Ann. Rep. 15 (discussing carbon-dioxide emissions from energy projects financed by the Bank).

200. See 2013 Ex-Im Annual Report, *supra* note 161, at 26; 2012 Ex-Im Annual Report, *supra* note 161, at 26; 2011 Ex-Im Annual Report, *supra* note 18, at 20. The projected emissions from projects in 2014 did represent a significant decrease in carbon dioxide emissions from foreign energy projects. See 2014 Exp.-Imp. Bank of the U.S. Ann. Rep. 36 (describing energy projects having aggregate annual emissions of 6.3 million metric tons per year). Seemingly, this decrease was due to the financing of natural gas power plants, which produce fewer emissions than do other fossil-fuel-fired plants. *Id.* It is difficult to ascertain whether this trend would have continued in 2015, since the Bank's charter lapsed and emissions were subsequently artificially lower than they likely otherwise would have been. See 2015 Exp.-Imp. Bank of the U.S. Ann. Rep. 3. In 2016, Ex-Im reported that it authorized "no new financing of fossil-fuel projects that produce greenhouse gases." 2016 Exp.-Imp. Bank of the U.S. Ann. Rep. 58. This progress is commendable, but the larger point remains: Ex-Im's activities do not appear to correlate with the requirement that it report annual GHG emissions.

201. See Shalev et al., *supra* note 132 (explaining that the investment activities of Ex-Im are projected to offset the reductions in carbon emissions that would have resulted from the Obama Administration's Clean Power Plan).

202. As of October 2017, the Trump Administration has sought to rescind fifty-two pre-existing environmental regulations, Nadja Popovich & Livia Albeck-Ripka, 52 *Environmental Rules on the Way Out Under Trump*, N.Y. Times (Oct. 6, 2017), <http://www.nytimes.com/interactive/2017/10/05/climate/trump-environment-rules-reversed.html> (on file with the *Columbia Law Review*), including the Clean Power Plan, the cornerstone of President Obama's efforts to address climate change, see Brady Dennis & Juliet Eilperin, *Trump Administration Will Propose Repealing Obama's Key Effort to Combat Climate Change*, Wash. Post (Oct. 6, 2017), http://www.washingtonpost.com/news/energy-environment/wp/2017/10/05/trump-administration-will-propose-repealing-obamas-key-effort-to-combat-climate-change/?utm_term=.77f82a9af477 [<http://perma.cc/WMQ8-KQXM>]. That is not to say the Trump Administration has been entirely successful

issued an executive order disbanding the SCC interagency working group, ordering the withdrawal of the metric's technical support documents, and directing agencies to calculate GHG emissions in accordance with OMB Circular A-4—a George W. Bush-era Office of Management and Budget guidance document.²⁰³

Still, the executive order did not ring the death knell for the SCC, and there are limits to the Trump Administration's ability to rescind the tool completely. For one, agencies remain under a legal obligation to consider climate change in the regulatory cost-benefit analysis context in accordance with the Ninth Circuit's decision in *Center for Biological Diversity v. NHTSA*.²⁰⁴ Further, the Supreme Court has embraced a presumption that environmental statutes require the consideration of regulatory costs and benefits,²⁰⁵ including ancillary costs and benefits, which presumably include costs arising from GHGs.²⁰⁶ Therefore, the wholesale rejection of climate considerations in the regulatory cost-benefit context seems contrary to law, at least for now.

While the executive order's directive that agencies calculate costs associated with GHG emissions in conformity with OMB Circular A-4 does suggest that agencies should assign a lower cost to GHG emissions,²⁰⁷ the Trump Administration has yet to issue guidance as to what number agencies should assign GHG emissions in their cost-benefit analyses.²⁰⁸ In the absence of this guidance, agencies will have to arrive at a number on their own,²⁰⁹ and any figure assigned to GHG emissions will have to be

in its efforts. See Eric Lipton, Courts Thwart Administration's Effort to Rescind Obama-Era Environmental Regulations, *N.Y. Times* (Oct. 6, 2017), <http://www.nytimes.com/2017/10/06/climate/trump-administration-environmental-regulations.html> (on file with the *Columbia Law Review*).

203. See Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (Mar. 28, 2017).

204. See 538 F.3d 1172, 1203 (9th Cir. 2008); Dan Farber, Legal Mandates to Consider the Social Cost of Climate Change, *Legal Planet* (Dec. 13, 2016), <http://legal-planet.org/2016/12/13/the-legal-mandate-to-consider-the-social-cost-of-climate-change/> [<http://perma.cc/9AT2-SDCL>] [hereinafter Farber, *Legal Mandates*] (discussing agencies' duty to consider the SCC in spite of the Trump Administration's hostility toward the tool).

205. See *Michigan v. EPA*, 135 S. Ct. 2699, 2707 (2015) (endorsing cost-benefit analysis as a measure of rationality); Farber, *Legal Mandates*, supra note 204.

206. See Farber, *Legal Mandates*, supra note 204 (discussing the Supreme Court's decision in *Michigan v. EPA*).

207. Professor Cass Sunstein notes that conformity with OMB Circular A-4 would favor emphasizing the domestic rather than global costs of climate change, and the use of discount rates of 7% and 3%. Cass R. Sunstein, *Making Sense of Trump's Order on Climate Change*, *Bloomberg: View* (Mar. 29, 2017), <http://www.bloomberg.com/view/articles/2017-03-29/making-sense-of-trump-s-order-on-climate-change> [<http://perma.cc/A9R6-XPNC>].

208. Andrew Revkin, *Failure to Set Cost of Carbon Hampers Trump's Effort to Expand Use of Fossil Fuels*, *ProPublica* (Aug. 24, 2017), <http://www.propublica.org/article/failure-to-set-cost-of-carbon-hampers-trumps-effort-to-expand-use-of-fossil-fuels> [<http://perma.cc/W5XW-2SMV>].

209. Sunstein, supra note 207.

defended under an arbitrary and capricious standard of review.²¹⁰ Given the recent cases upholding the use of the SCC, agencies may face legal pressure to not deviate significantly from the status quo in the absence of formal guidance.²¹¹ More fundamentally, even if the Trump Administration successfully depresses the price of the SCC, nothing prevents a future administration from using the SCC as it was applied under the Obama Administration, and states remain free to integrate the federal SCC into state programs.²¹²

With these considerations in mind, this Part focuses on the strategies a future administration may utilize to integrate the SCC into the NEPA review process and initiatives states should consider in addressing the CO₂ monetization gap. This Part is organized as follows: Section III.A offers a brief normative argument in support of integrating the SCC into the NEPA review process as a necessary means of faithfully fulfilling the purposes of NEPA. Section III.B discusses various legal strategies a future administration may take to integrate the SCC into the NEPA review process. Finally, section III.C discusses actions states may take to mitigate the negative consequences of the CO₂ monetization gap within their own jurisdictions.

A. *In Support of Integrating the SCC into NEPA Review*

This section provides a normative argument in favor of the monetization of GHG emissions in NEPA-review analyses, keeping in mind the twin aims of NEPA.²¹³ While a comprehensive discussion of the merits and demerits of cost–benefit analysis is beyond the scope of this Note, a brief overview of these arguments is useful here.

Professors Frank Ackerman and Lisa Heinzerling argue that many of our most important health, safety, and environmental values are priceless and cannot adequately be expressed in dollar terms.²¹⁴ As they write, “The imperatives of protecting human life, health, and the natural world

210. See *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1203 (9th Cir. 2008) (using the arbitrary and capricious standard to review the agency’s cost–benefit analysis).

211. See Revkin, *supra* note 208; see also *Zero Zone, Inc. v. U.S. Dep’t of Energy*, 832 F.3d 654, 677 (7th Cir. 2016); *Mont. Envtl. Info. Ctr. v. U.S. Office of Surface Mining*, CV 15-106-M-DWM, 2017 WL 3480262, at *15 (D. Mont. Aug. 14, 2017).

212. Indeed, a number of states have already integrated the SCC into state environmental programs. See, e.g., Jessica Collingsworth, *A Huge Success in Illinois: Future Energy Jobs Bill Signed into Law*, Union of Concerned Scientists: The Equation (Dec. 8, 2016), <http://blog.ucsusa.org/jessica-collingsworth/big-win-illinois-energy> [<http://perma.cc/XN3S-2FX>] (discussing the Future Energy Jobs Bill). The possibility of further integrating the federal SCC into state programs is discussed at greater length *infra*, in section III.C.

213. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) (describing the twin aims of NEPA).

214. Frank Ackerman & Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* 207 (2004).

around us, and ensuring equitable treatment of rich and poor, and of present and future generations, are not sold in markets and cannot be assigned meaningful prices.”²¹⁵ While some of the benefits associated with protecting life, health, and nature can be assigned a price, Ackerman and Heinzerling argue that doing so will never fully reflect “the full strength of our impulse to protect” these values.²¹⁶ At the same time, cost estimates of regulations are relatively complete, with the result that cost–benefit analyses skew in favor of deregulation.²¹⁷

Ackerman and Heinzerling’s critique of cost–benefit analysis is germane in assessing the utility of the SCC as a tool for crafting social policy. First, the discount rates employed are contentious²¹⁸ and inevitably involve assigning a value to the well-being of future generations. Second, the damage functions²¹⁹ utilized in the SCC are, likewise, controversial²²⁰ and undervalue important costs associated with climate change, such as reduced productivity in the agriculture, forestry, and fishery sectors, diminished ecosystem services, and harms to human life and health, not to mention the “priceless” values discussed above.²²¹

Despite these shortcomings, this Note proposes that the SCC should be integrated into the NEPA review process. As a preliminary matter, the use of cost–benefit analysis in environmental decisionmaking is well established and is unlikely to disappear anytime soon.²²² Accordingly, the decision to not monetize GHG emissions is akin to assigning them a value of zero in the regulatory cost–benefit analysis context, resulting in the undervaluation of climate change in the decisionmaking process.²²³

215. *Id.*

216. *Id.*

217. *Id.*

218. See *supra* notes 38–42 and accompanying text (discussing various proposed discount rates).

219. Damage functions are the formulae used by economists to translate damages arising from climate change into dollar terms. See, e.g., Martin L. Weitzman, What Is the “Damages Function” for Global Warming—and What Difference Might It Make?, 1 *Climate Change Econ.* 57, 57 (2010).

220. See *Zero Zone, Inc. v. U.S. Dep’t of Energy*, 832 F.3d 654, 678 (7th Cir. 2016) (describing DOE’s acknowledgment of limitations to model inputs and damage functions employed in the SCC).

221. See EPA, SCC Fact Sheet, *supra* note 30, at 1 (“The models used to develop [SCC] estimates do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages . . .”); Peter Howard, The Cost of Carbon Project, Omitted Damages: What’s Missing from the Social Cost of Carbon 2–5 (2014) (listing the damages omitted from the social cost of carbon).

222. See Revesz & Livermore, *supra* note 24, at 11 (“Cost–benefit analysis has enormous currency in the federal policymaking apparatus. It is statutorily required for important environmental, health and safety programs.”); see also Exec. Order No. 13,563, 3 C.F.R. 215, 215 (2012) (requiring cost–benefit analysis when agencies propose regulations).

223. See *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1192 (D. Colo. 2014) (“Yet by deciding not to quantify the [GHG emissions] costs at

Moreover, as Professor Richard Revesz points out, there is nothing inherent about cost–benefit analysis that results in the undervaluation of human life, health, and environmental considerations; such values are undervalued when they are *underpriced*—however, “[t]he benefits of saving lives, preserving nature for future generations, and avoiding environmental catastrophe, [when] properly calculated, will often outweigh the short-term costs of regulation.”²²⁴

Integration of the SCC into NEPA review also serves to best fulfill NEPA’s twin aims of ensuring that agencies take into consideration the present and future consequences of their decisions and of apprising the public of the environmental consequences of federal actions.²²⁵ As to the first aim, assigning a value to GHG emissions associated with a project removes, or at least reduces, possible bias in decisionmaking for activities that fall within the CO₂ monetization gap.²²⁶ Courts have held that environmental analyses that undervalue environmental costs or artificially inflate economic benefits are inherently misleading and in conflict with the very purposes of NEPA review.²²⁷ By assigning a positive value to the cost of GHG emissions, integrating the SCC into NEPA alleviates this systemic bias, which currently favors development and carbon-intensive projects.²²⁸

With regard to NEPA’s second function, translating the effects of GHG emissions into tangible terms strengthens federal actors’ ability to meaningfully inform the public and other government actors of the environmental impacts of a proposed project.²²⁹ Because of the complexity, scale, and intangibility of climate change, the true cost of a marginal

all, the agencies effectively zeroed out the cost in its quantitative analysis.”); see also Revesz & Livermore, *supra* note 24, at 10 (describing the deregulatory bias of cost–benefit analysis).

224. Revesz & Livermore, *supra* note 24, at 15.

225. See *supra* note 20 and accompanying text.

226. See *Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 446 (4th Cir. 1996) (stating that misleading economic statements subvert the purpose of an EIS); see also *High Country Conservation Advocates*, 52 F. Supp. 3d at 1182 (“[W]here [cost–benefit] analysis is included it cannot be misleading.”); *supra* notes 145–147 and accompanying text (discussing the cognitive difficulty in appreciating risks associated with climate change).

227. See, e.g., *Hughes River Watershed Conservancy*, 81 F.3d at 446 (holding cost–benefit analyses in EISs cannot be misleading).

228. Revesz & Livermore, *supra* note 24, at 15 (explaining that cost–benefit analyses are biased only because environmental considerations are improperly priced).

229. See *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 754 (2004) (defining NEPA’s second goal as ensuring “that the public receives information so it might also play a role in the decisionmaking process”); *Columbia Basin Land Prot. Ass’n v. Schlesinger*, 643 F.2d 585, 592 (9th Cir. 1981) (explaining NEPA requires making “available to the public[] information of the proposed project’s environmental impact and encourag[ing] public participation in the development of that information”).

increase in GHG emissions can be difficult to appreciate.²³⁰ By expressing these effects in economic terms, integration of the SCC into NEPA ensures that the public is given a meaningful opportunity to know the consequences of carbon-intensive federal activities, such as Ex-Im's fossil-fuel financing initiatives.²³¹ An informed public, in turn, helps keep federal agencies accountable, increasing the likelihood that government actions are undertaken in the public interest.²³²

B. *Potential Strategies to Integrate the SCC into NEPA via Executive Action*

Having argued that integration of the SCC into NEPA is necessary to fulfill the primary aims of NEPA, this section examines possible strategies a future administration might take to integrate the SCC into NEPA to address the CO₂ monetization gap. Section III.B.1 argues that integration of the SCC into NEPA review is legally feasible via CEQ regulation. Section III.B.2 then examines the plausibility of incorporating the SCC into NEPA review via executive order.

1. *Integrating the SCC into NEPA via CEQ Regulation.* — This section examines the legal feasibility of integrating the SCC into NEPA via CEQ regulation. As will be shown, this approach is likely to survive judicial scrutiny. This section first examines whether a CEQ regulation integrating the SCC into NEPA review would be a permissible construction of the NEPA statute and then considers whether such a regulation would survive arbitrary and capricious review.

In examining whether CEQ could integrate the SCC into NEPA via regulation, it must first be determined whether such a regulation would constitute a permissible construction of the NEPA statute. Typically, an agency's construction of the statute it administers is subject to *Chevron* deference.²³³ However, the fundamental logic guiding the *Chevron* framework is inapplicable here because Congress did not delegate authority to CEQ to issue regulations directing how agencies must conduct NEPA analyses.²³⁴ Indeed, NEPA's statutory text does not give CEQ the

230. See *supra* notes 145–147 and accompanying text (discussing factors contributing to climate change denial and arguing that monetization allows for comparing competing values in the climate context).

231. *Supra* notes 145–147.

232. See, e.g., *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) (describing how NEPA serves as a “springboard” for public comment and holding agencies accountable).

233. *Chevron U.S.A. Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 842–44 (1984) (setting out the two-step process for judicial review of an agency's construction of a statute).

234. See *id.* at 843–44 (explaining that the deference owed to an agency's interpretation of a statute derives from Congress's delegation, explicit or implicit, to the agency to “fill any gap left”); cf. *King v. Burwell*, 135 S. Ct. 2480, 2489 (2015) (holding that *Chevron* did not apply when an interpretation of the Affordable Care Act implicated a question of “deep economic and political significance”); *Gonzales v. Oregon*, 546 U.S.

authority to issue regulations regarding NEPA analyses, and, at the time of NEPA's promulgation, CEQ guidelines were understood to be merely advisory in nature.²³⁵ Instead, CEQ's authority to issue regulations derives from the executive branch—President Carter, through executive order, directed that CEQ “[i]ssue regulations to Federal agencies for the implementation of the procedural provisions’ of NEPA.”²³⁶

However, the Supreme Court has reiterated that, while not technically binding, CEQ regulations are entitled to “substantial deference.”²³⁷ Ordinarily, mere *Skidmore* deference would apply here since *Chevron* is inapplicable,²³⁸ but in *Robertson v. Methow Valley Citizens Council*,²³⁹ the Supreme Court concluded otherwise. In considering the controlling weight of a new CEQ regulation that eliminated a requirement that agencies conduct worst-case analyses in preparing EISs, the Court held that the new regulation should be afforded “substantial deference” because there was “good reason for the change” and “the amendment was designed to better serve the twin functions of an EIS.”²⁴⁰

As already discussed, there is good reason to integrate the SCC into the NEPA review process—there is evidence that the current GHG reporting regime has failed to fulfill the information-forcing purpose of NEPA, resulting in suboptimal environmental decisionmaking.²⁴¹ Moreover, integrating the SCC into NEPA review would best fulfill the twin aims of NEPA, as discussed at length in section III.A.²⁴² Accordingly, incorporation of the SCC into NEPA review would likely survive a challenge

243, 255–56, 268 (2006) (holding that Congress did not delegate authority to the Attorney General to promulgate a rule declaring assisted suicide illegal); *United States v. Mead Corp.*, 533 U.S. 218, 226–27 (2001) (“We hold that administrative implementation of a particular statutory provision qualifies for *Chevron* deference when it appears that Congress delegated authority to the agency generally to make rules carrying the force of law”); *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 155–59 (2000) (finding it implausible that Congress intended to delegate to the FDA the authority to regulate tobacco and, thus, finding *Chevron* deference inappropriate).

235. *Andrus v. Sierra Club*, 442 U.S. 347, 356–57 (1979).

236. *Id.* at 357 (alteration in original) (quoting Exec. Order No. 11,991, 3 C.F.R. 123, 124 (1978)).

237. *Methow Valley Citizens Council*, 490 U.S. at 333–34; *Sierra Club*, 442 U.S. at 358 (citing Warm Springs Dam Task Force v. Gribble, 417 U.S. 1301, 1309–10 (1974)).

238. See, e.g., *Gonzales*, 546 U.S. at 268 (“Since the Interpretive Rule was not promulgated pursuant to the Attorney General’s authority, its interpretation of ‘legitimate medical purpose’ does not receive *Chevron* deference. Instead, it receives deference only in accordance with *Skidmore*.”).

239. 490 U.S. 332.

240. *Id.* at 355–56.

241. See, e.g., *supra* section II.B.3 (discussing the current GHG reporting regime’s failures in the context of Ex-Im’s fossil-fuel financing activities).

242. See *supra* section III.A (discussing the merits of incorporating the SCC into NEPA).

based upon CEQ's construction of NEPA's text and would be afforded "substantial deference."²⁴³

Further bolstering this argument, NEPA's text seems to permit agencies to utilize cost-benefit analysis in preparing EISs.²⁴⁴ In *Entergy Corp. v. Riverkeeper, Inc.*, the Supreme Court clarified that it was permissible for an agency to utilize cost-benefit analysis when the relevant statutory provision does not explicitly preclude the application of cost-benefit analysis,²⁴⁵ unless the statutory silence is "best interpreted as limiting agency discretion."²⁴⁶

Nothing in the statutory text of NEPA precludes the consideration of costs in the preparation of EISs,²⁴⁷ and current CEQ regulations and CEQ guidance explicitly consider the application of cost-benefit analysis in NEPA review.²⁴⁸ Moreover, courts have consistently upheld the use of cost-benefit analysis in NEPA review so long as the relationship between quantified and unquantified environmental costs and benefits is discussed.²⁴⁹ Early cases even characterize the NEPA-review process and the

243. In addition, CEQ regulations already include significant directives specifying what information agencies must include in environmental analyses. CEQ regulations state, for instance, that if a cost-benefit analysis is being considered for a proposed action, it should be incorporated by reference to the environmental impact statement. 40 C.F.R. § 1502.23 (2016). One question that remains in proceeding via CEQ regulation is whether the regulation would be binding on independent agencies like Ex-Im. The Nuclear Regulatory Commission (NRC) holds the position that, as an independent agency, it is not bound by CEQ regulations—presumably because CEQ's rulemaking authority derives from executive order rather than from congressional grant—though it has committed to "[e]xamine any future interpretation or change to the Council's [CEQ] NEPA regulations." U.S. NRC, Environmental Analysis and Decision Making: The National Environmental Policy Act (NEPA) at the NRC 44, 66–67 (2015) (alteration in original), <http://www.nrc.gov/docs/ML1610/ML16103A340.pdf> [<http://perma.cc/YQN2-547W>]. A complete analysis of this issue is beyond the scope of this Note. However, given the broad language of NEPA, which does not distinguish between types of federal agencies, and the Supreme Court's repeated assertion that CEQ regulations are afforded substantial deference, NRC's position does not seem tenable. See 42 U.S.C. § 4332 (2012); *Methow Valley Citizens Council*, 490 U.S. at 333–34; *Andrus v. Sierra Club*, 442 U.S. 347, 347–48 (1979).

244. Rowell argues that agencies need to look to their organic statutes to determine whether they can consider the SCC. See Rowell, *supra* note 47, at 402.

245. 556 U.S. 208, 218–22 (2009).

246. *Id.* at 223. The Court distinguished its decision in *Whitman v. American Trucking Associations*, in which it found that the Clean Air Act's silence with respect to costs prohibited cost-benefit analysis in setting air quality standards. 531 U.S. 457, 468 (2001) ("Congress . . . does not, one might say, hide elephants in mouseholes."); see also Rowell, *supra* note 47, at 404.

247. To the contrary, NEPA requires that federal agencies "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences . . . in planning and in decisionmaking." 42 U.S.C. § 4332(A).

248. See *supra* notes 85–86, 95–98 and accompanying text (discussing regulations and guidance related to utilizing cost-benefit analysis in NEPA review).

249. See, e.g., *Johnston v. Davis*, 698 F.2d 1088, 1094–95 (10th Cir. 1983) (holding the Soil Conservation Service needed to explain and qualify its use of a 3.25% discount rate in

mandate to consider alternative courses of action as a form of cost-benefit analysis.²⁵⁰ Thus, the statute's silence as to cost-benefit analysis is best interpreted as permitting consideration of monetary costs, such as those considered within the SCC.

Even after considering whether NEPA's text permits the application of monetized environmental costs in the NEPA-review context, the inclusion of GHG emissions in this analysis may be challenged as arbitrary and capricious under the Administrative Procedure Act (APA).²⁵¹ The Seventh Circuit's analysis in *Zero Zone, Inc.* is instructive here. In that case, the court considered the Energy Policy and Conservation Act's mandate that DOE consider "the need for national energy . . . conservation."²⁵² The court concluded that "[t]o determine whether an energy conservation measure is appropriate under a cost-benefit analysis, the expected reduction in environmental costs needs to be taken into account . . . Congress intended that DOE have the authority under the EPCA to consider the reduction in SCC."²⁵³

Certainly if Congress's mandate to consider energy conservation under the EPCA is broad enough to include costs resulting from GHG emissions, NEPA's requirement that agencies examine "environmental impact[s]" and "adverse environmental effects" encompasses the damages caused by GHG emissions.²⁵⁴ Further, courts have interpreted NEPA's language as *requiring* agencies to consider GHG emissions.²⁵⁵ Both of

an EIS to adequately inform the public and decisionmakers of available alternatives); *Izaak Walton League v. Marsh*, 655 F.2d 346, 368–70 (D.C. Cir. 1981) (requiring cost-benefit analysis and methodology be included with environmental impact statements, but finding disclosures sufficient to meet NEPA obligations); *Env't. Def. Fund, Inc. v. Marsh*, 651 F.2d 983, 1000–01 (5th Cir. 1981) (same).

250. See, e.g., *Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n.*, 449 F.2d 1109, 1114 (D.C. Cir. 1971) ("[L]ike the 'detailed statement' requirement, [the discussion of alternatives] seeks to ensure that each agency decision maker has before him and takes into proper account all possible approaches to a particular project . . . which would alter the environmental impact and the cost-benefit balance.").

251. See *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (reciting the arbitrary and capricious standard of review); see also *Zero Zone, Inc. v. U.S. Dep't. of Energy*, 832 F.3d 654, 677–78 (7th Cir. 2016) (applying the arbitrary and capricious standard of review to the agency's decision to use the SCC in its cost-benefit analysis).

252. *Zero Zone, Inc.*, 832 F.3d at 677 (internal quotation marks omitted) (quoting 42 U.S.C. § 6295(o)(2)(B)(i)(VI) (2012)).

253. *Id.*

254. 42 U.S.C. § 4332(C).

255. See, e.g., *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1217 (9th Cir. 2008) ("The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct."). Recent developments in the case law also lend support to this conclusion. See *Mont. Env't. Info. Ctr. v. U.S. Office of Surface Mining*, CV 15-106-M-DWM, 2017 WL 3480262, at *15 (D. Mont. Aug. 14, 2017) (finding it arbitrary and capricious to reject use of the SCC when the agency had quantified economic benefits from the project); see also *Sierra Club v. FERC*,

these considerations strongly support the conclusion that monetized effects of GHG emissions are a permissible factor for an agency to consider when conducting its NEPA-review analysis.

A more credible, though surmountable, legal obstacle to integrating the SCC into the NEPA review process is the SCC's consideration of the *global* effects of GHG emissions.²⁵⁶ As Professor Rowell points out, “[E]ven where a statute is reasonably read to permit cost–benefit analysis, it might not be reasonably read to permit a globally scoped cost–benefit analysis.”²⁵⁷ Moreover, the Supreme Court has reiterated a presumption against the extraterritorial reach of statutes, which may create the inference that NEPA review should implicate only domestic environmental concerns.²⁵⁸

The Seventh Circuit's decision in *Zero Zone, Inc.*, however, suggests that courts may take a highly deferential approach when analyzing whether a statute allows for the consideration of global, rather than domestic, costs and benefits associated with GHG emissions. In that case, the court accepted DOE's argument that reducing GHGs provides global benefits that have no corresponding global costs that could have been included in the analysis and concluded, therefore, that DOE did not act arbitrarily and capriciously.²⁵⁹ Moreover, NEPA expressly contemplates that agencies consider global environmental consequences, requiring the federal government to “recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment.”²⁶⁰

867 F.3d 1357, 1375 (D.C. Cir. 2017) (“On remand, FERC should explain in the EIS, as an aid to the relevant decisionmakers, whether the position on the Social Cost of Carbon that the agency took in *EarthReports* still holds, and why.”).

256. See Rowell, *supra* note 47, at 409 (noting “the general default acceptance of cost-benefit methodologies [does not] resolve the question of whether agencies may use a particular (e.g., global) cost-benefit methodology to calculate the SCC”).

257. *Id.*

258. See *Morrison v. Nat'l Austl. Bank Ltd.*, 561 U.S. 247, 248 (2010) (citing *EEOC v. Arabian Am. Oil Co.*, 499 U.S. 244, 248 (1991)). The extraterritorial application of NEPA has long been controversial, and the extent of NEPA's reach abroad is unclear. See, e.g., Browne C. Lewis, *It's a Small World After All: Making the Case for the Extraterritorial Application of the National Environmental Policy Act*, 25 *Cardozo L. Rev.* 2143, 2145 (2004) (discussing why NEPA should be applied extraterritorially); Sara E. Baynard, Note, *The Extraterritorial Reach of NEPA and the Creation of a Foreign Policy Exemption*, 28 *Vt. L. Rev.* 173, 173 (2003) (stating that the extraterritorial reach of NEPA is still unclear).

259. *Zero Zone, Inc. v. U.S. Dep't of Energy*, 832 F.3d 654, 679 (7th Cir. 2016).

260. 42 U.S.C. § 4332(F) (2012). President Carter's Executive Order No. 12,114 also requires that EISs be prepared for major federal actions significantly affecting the environment of the “global commons” or natural resources of “global importance.” Exec. Order No. 12,114, 3 C.F.R. 356, 357 (1980), reprinted in 42 U.S.C. § 4321 (1982). The

As to the presumption against extraterritoriality, the D.C. Circuit has made it clear that NEPA applies to activities over which the United States has sovereignty or that affect the global commons.²⁶¹ Courts have interpreted this holding generally to include domestic activities having international effects, so long as legal application of the statute does not infringe on another nation's sovereignty.²⁶² There is a compelling case to be made that global climate considerations fit within this category of activities. First, the atmosphere, like Antarctica or the high seas, is a "global commons" over which no nation has sovereignty.²⁶³ More fundamentally, the application of the SCC to NEPA would not implicate the sticky practical considerations that motivate the presumption against extraterritoriality—i.e., to protect against clashes between U.S. laws and those of other nations and to avoid "international discord"²⁶⁴—because application of the SCC to the NEPA-review process does *not* require applying U.S. law to foreign activities; it merely requires that certain global environmental considerations be factored into the decision-making process for *domestic* federal activities.²⁶⁵ Accordingly, for the aforementioned reasons, integrating the SCC into the NEPA-review process via CEQ regulation appears to be a permissible application of the NEPA statute and would likely withstand judicial scrutiny.²⁶⁶

executive order also requires the preparation of environmental studies and environmental assessments in other circumstances involving extraterritorial environmental effects. *Id.*

261. See *Env'tl. Def. Fund, Inc. v. Massey*, 986 F.2d 528, 536–37 (D.C. Cir. 1993) (upholding NEPA's application to the National Science Foundation's activities in Antarctica).

262. See, e.g., *Ctr. for Biological Diversity v. Nat'l Sci. Found.*, No. C 02-5065 JL, 2002 WL 31548073, at *3 (N.D. Cal. Oct. 30, 2002) (citing *Env'tl. Def. Fund, Inc.*, 986 F.2d at 529–30) (applying NEPA to the National Science Foundation's activities on the high seas).

263. See *Env'tl. Def. Fund, Inc.*, 986 F.2d at 529 (describing a global commons as a territory over which no nation establishes rights of sovereignty).

264. *Id.* at 530 (quoting *EEOC v. Arabian Am. Oil Co.*, 499 U.S. 244, 248 (1991)) (discussing the primary purpose for the presumption against extraterritoriality).

265. Admittedly, this distinction is blurred when, as in the example of Ex-Im, domestic financing decisions implicate foreign investment projects that have significant global environmental consequences.

266. As an alternative to implementing the SCC through notice and comment rulemaking, an agency may also consider using informal guidance. This approach may be procedurally simpler and less politically contentious than using formal rulemaking procedures. E.g., Connor N. Raso, Note, *Strategic or Sincere? Analyzing Agency Use of Guidance Documents*, 119 *Yale L.J.* 782, 802–03 (2010) (discussing various procedural difficulties agencies face in the formal rulemaking process). The CEQ routinely issues guidance memoranda to agency heads, for instance, and the CEQ could adopt a similar approach here, stating that its interpretation of the CEQ regulations requires consideration of the SCC in environmental analyses. See Sara E. Light, *NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 *Tul. L. Rev.* 511, 567–68 (2013) (discussing the feasibility of incorporating a carbon tax into the NEPA review process through CEQ guidance). While such guidance would presumably be afforded less deference than would regulations that go through typical notice and comment procedures, see, e.g., *Ass'n Working for Aurora's Residential Env't. v. Colo. Dep't of Transp.*, 153 F.3d 1122, 1127 n.4 (10th Cir. 1998) ("Although we recognize that we may rely on the

2. *Integrating the SCC into NEPA via Executive Order.* — This section provides a broad overview of the legal feasibility of implementing the SCC into NEPA via executive order. Executive orders under NEPA are not subject to the APA.²⁶⁷ Accordingly, an executive could direct agencies to utilize the SCC in their NEPA analyses without going through notice and comment procedures or facing judicial scrutiny under that statute.²⁶⁸ Still, executive orders are reviewable for constitutionality and, in order to have the force of law, their authority must derive from congressional delegation or from the Constitution.²⁶⁹ To defend the constitutionality of an executive order directing agencies to apply the SCC in NEPA review, therefore, a future administration must find support in the text of a statute or the Constitution.

As to the congressional authority for such an executive order, a future administration could look to the language of NEPA and argue that it gives the Executive the authority to mandate specific reporting requirements in order to fulfill NEPA's provisions. Specifically, section 102(B) requires that agencies "identify and develop methods and procedures, in consultation with the Council on Environmental Quality."²⁷⁰ Given that Congress created the CEQ in the Executive Office of the President and the Council members serve at the pleasure of the President,²⁷¹ an administration would have a forceful claim that Congress

interpretive guidance offered by the CEQ, the Forty Questions document is not owed the substantial deference afforded to administrative rules that are the product of notice and comment procedures."), it would still be controlling unless "plainly erroneous or inconsistent" with existing CEQ regulations, see *Auer v. Robbins*, 519 U.S. 452, 461 (1997) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 359 (1989)); *Light*, *supra*, at 567–68 (discussing deference afforded CEQ guidance).

267. Bradley C. Karkkainen, *Whither NEPA?*, 12 N.Y.U. *Env'tl. L.J.* 333, 335 n.13 (2004).

268. *Id.*; see also *Franklin v. Massachusetts*, 505 U.S. 788, 800–01 (1992) (explaining that the President is not explicitly included in the APA's domain). Of course, an agency conducting its NEPA review in accordance with an executive order would face scrutiny under the APA. Indeed, this is the situation agencies now face in the wake of President Trump's directive that agencies not use the SCC in conducting cost–benefit analyses. See *Revkin*, *supra* note 208 (explaining that agencies face being reversed on arbitrary and capricious grounds for insufficient consideration of climate change).

269. See *Youngstown Sheet & Tube Co. v. Sawyer*, 343 U.S. 579, 585 (1952); see also *Chrysler Corp. v. Brown*, 441 U.S. 281, 304 (1979) ("[T]o have the 'force and effect of law,' it is necessary to establish a nexus between the regulations and some delegation of the requisite legislative authority by Congress."); *Old Dominion Branch No. 496 v. Austin*, 418 U.S. 264, 273 n.5 (1974) (finding that the executive order was a "reasonable exercise of the President's responsibility for the efficient operation of the Executive Branch" and that it had express statutory authority). Note that as of this writing, the author has not found a legal challenge assessing the validity of an executive order issued under NEPA.

270. 42 U.S.C. § 4332(B) (2012).

271. *Id.* § 4342 ("There is created in the Executive Office of the President a Council on Environmental Quality The Council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate.").

implicitly granted the executive branch the authority to enforce the terms of NEPA.²⁷²

A future administration could also argue that its authority to issue such an executive order stems from the President's constitutional obligation to "take care" that the laws are faithfully executed.²⁷³ In so doing, an administration could argue that the faithful execution of NEPA's mandate that agencies assess "the environmental impact[s] of [a] proposed action" and meaningfully consider "alternatives to [a] proposed action" requires use of the SCC in the NEPA process.²⁷⁴ In practice, executive orders passed under NEPA invoke both constitutional and statutory sources of authority.²⁷⁵

The legality of implementing the SCC into NEPA through executive order is supported by the extensive use of executive orders in the NEPA context throughout the statute's history. Starting in 1977, presidents have issued at least forty-two executive orders related to NEPA.²⁷⁶ This history provides strong precedent for implementing substantive reporting mandates via executive order. President Clinton's Executive Order 13,186, for instance, requires federal agencies conducting NEPA environmental analyses to consider an action's effects on migratory birds.²⁷⁷ In another executive order, President Clinton directed that environmental reviews be conducted for trade agreements, requiring that they include "[a]s appropriate and prudent, . . . *global and transboundary impacts*."²⁷⁸

272. Note that NEPA executive orders have typically cited to the provisions of NEPA, generally, as a source of authority. See, e.g., Exec. Order No. 13,186, 3 C.F.R. 719, 719 (2002) (citing as authority 42 U.S.C. §§ 4321–4347).

273. U.S. Const. art. II, § 3, cl. 5; cf. *Youngstown*, 343 U.S. at 610 (Frankfurter, J., concurring) ("The duty of the President to see that the laws be executed is a duty that does not go beyond the laws or require him to achieve more than Congress sees fit to leave within his power." (quoting *Myers v. United States*, 272 U.S. 52, 177 (1926))).

274. 42 U.S.C. § 4332(C). For an argument that incorporation of the SCC most faithfully fulfills the information-forcing aims of NEPA, see *supra* section III.A.

275. See, e.g., Exec. Order No. 13,186, 3 C.F.R. at 719 (citing as authority the Constitution, the laws of the United States, and 42 U.S.C. §§ 4321–4347). Notably, President Trump's Executive Order 13,783 does not invoke any specific statutory or constitutional authority. See Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (Mar. 28, 2017).

276. See Exec. Order No. 13,783, 82 Fed. Reg. at 16,093; Executive Orders, NEPA.gov, http://ceq.doe.gov/laws-regulations/executive_orders.html [<http://perma.cc/59MF-F766>] (last visited Oct. 13, 2017) (listing executive orders pertaining to NEPA).

277. Exec. Order No. 13,186, 3 C.F.R. at 719.

278. Exec. Order No. 13,141, 3 C.F.R. 235, 236 (2000) (emphasis added). As with the CEQ regulations, the question remains whether an executive order would be binding on an independent agency such as Ex-Im. The NRC takes the position, for instance, that it is not necessarily bound to comply with NEPA-related executive orders. U.S. Nuclear Regulatory Comm'n, *supra* note 243, at 67. Again, a full analysis of this issue is beyond the purview of this Note. Given the broad scope of NEPA section 102, see 42 U.S.C. § 4332 (not distinguishing among types of federal agencies), and the constitutional authority supporting an executive order under NEPA discussed here, this position does not appear defensible.

In sum, implementing the SCC into NEPA via executive order is a viable legal approach. Proceeding in this manner has two distinct advantages. First, through executive order, an executive can integrate the SCC into NEPA through a mere stroke of the pen.²⁷⁹ Second, an administration could more easily tailor the scope of an executive order by targeting only specific federal agencies or activities.²⁸⁰ Still, the use of executive orders to implement substantive policy measures has been heavily criticized and is a frequent target of partisan vitriol.²⁸¹ Moreover, the formal rulemaking process serves important public-participation and accountability purposes.²⁸² Accordingly, a future administration should favor proceeding through formal CEQ rulemaking, though implementation through executive order remains a feasible legal alternative.

C. *Integrating the Social Cost of Carbon into State Environmental Programs*

Significant opportunities exist for states and cities to integrate the SCC into state and local environmental programs. This section provides a brief overview of some methods states and municipalities may consider to address the CO₂ monetization gap. A number of states have already elected to utilize the federal SCC in circumstances beyond the regulatory cost-benefit context. For instance, Illinois recently adopted the Future Energy Jobs Act, which subsidizes nuclear energy production for avoided economic damages based on the federal SCC.²⁸³ A similar Zero-Emission Credit program subsidy based on the federal SCC exists in New York as

279. See Karkkainen, *supra* note 267, at 335 (discussing executive orders under NEPA).

280. See, e.g., Exec. Order No. 13,141, 3 C.F.R. at 236 (targeting NEPA review of trade agreements).

281. See, e.g., John C. Duncan, Jr., A Critical Consideration of Executive Orders: Glimmerings of Autopoiesis in the Executive Role, 35 *Vt. L. Rev.* 333, 343–45 (2010) (describing controversies surrounding the use of executive orders); John Hudak, Obama's Executive Orders: A Reality Check, Brookings Inst. (Jan. 30, 2014), <http://www.brookings.edu/blog/fixgov/2014/01/30/obamas-executive-orders-a-reality-check/> [<http://perma.cc/X9QV-UR3P>] (assessing the criticism of President Obama's reliance on executive orders).

282. See, e.g., James T. Hamilton & Christopher H. Schroeder, Strategic Regulators and the Choice of Rulemaking Procedures: The Selection of Formal vs. Informal Rules in Regulating Hazardous Waste, *Law & Contemp. Probs.*, Spring 1994, at 111, 118–19.

283. Collingsworth, *supra* note 212.

well.²⁸⁴ Minnesota has used the federal SCC to credit electricity customers who generate excess energy from residential solar panels since 2014.²⁸⁵

States and cities may utilize the SCC by integrating the tool into state and city environmental-impact-assessment statutes. Currently, sixteen states, the District of Columbia, New York City, and Puerto Rico have adopted state and local environmental reporting laws—known as “little NEPAs”—that operate analogously to NEPA.²⁸⁶

Nothing in NEPA prevents states from incorporating more stringent reporting requirements in their analogous environmental-impact-assessment statutes. New York State’s State Environmental Quality Review Act (SEQR) has incorporated a number of provisions that depart in significant ways from the requirements of NEPA.²⁸⁷ Under NEPA, for instance, an EIS is required when an action “will cause an adverse environmental impact”; under SEQR, the threshold is whether an action “*may* cause an adverse environmental impact.”²⁸⁸ Similarly, when the CEQ amended NEPA’s worst-case-analysis requirement to require only a discussion of “reasonably foreseeable significant adverse impacts,”²⁸⁹ some little NEPAs retained the worst-case-analysis mandate. New York City’s City Environmental Quality Review (CEQR) statute, for instance, requires agencies to include a reasonable worst-case-development scenario in their analyses.²⁹⁰ In a similar fashion, city and states could require use of

284. Jessica Bayles, McDermott Will & Emery, NY Creates New Emissions Credit for Nuclear Plants, *Energy Bus. L.* (Sept. 20, 2016), <http://www.energybusinesslaw.com/2016/09/articles/environmental/ny-creates-new-emissions-credit-for-nuclear-plants/> [<http://perma.cc/BVG7-JP7Y>]. For more information on New York’s Clean Energy Standard and Zero-Emission Credits, see generally Justin Gundlach & Romany Webb, Carbon Pricing in New York ISO Markets: Federal and State Issues (2017), <http://columbiaclimatelaw.com/files/2017/02/Gundlach-Webb-2017-02-Carbon-Pricing-in-NYISO-Markets.pdf> [<http://perma.cc/P6N6-CTB6>].

285. See Kiley Kroh, Minnesota Adopts First Statewide Method for Calculating the Value of Solar Power, *ThinkProgress* (Mar. 14, 2014), <http://thinkprogress.org/minnesota-adopts-first-statewide-method-for-calculating-the-value-of-solar-power-5a7167963bb9/> [<http://perma.cc/CH88-HPVN>].

286. States and Local Jurisdictions with NEPA-Like Environmental Planning Requirements, NEPA.gov, <http://ceq.doe.gov/laws-regulations/states.html> [<http://perma.cc/U8EY-XQ4W>] (last visited Oct. 11, 2017).

287. See generally Michael B. Gerrard et al., *Environmental Impact Review in New York* §§ 3.01–3.11 (2017).

288. SEQR and the National Environmental Policy Act (NEPA), Dep’t of Env’tl. Conservation (emphasis added), <http://www.dec.ny.gov/permits/50607.html> [<http://perma.cc/U497-2EJT>] (last visited Nov. 4, 2017).

289. 40 C.F.R. § 1502.22 (2016); Philip Weinberg, A Powerful Mandate: NEPA and State Environmental Review Acts in the Courts, 5 *Pace Env’tl. L. Rev.* 1, 10 (1987).

290. Mayor’s Office of Env’tl. Coordination, *City Environmental Quality Review Technical Manual 2–3* (2014), http://www.nyc.gov/html/oec/downloads/pdf/2014_ceqr_tm/2014_ceqr_technical_manual_rev_04_27_2016.pdf [<http://perma.cc/5D7Y-D84X>] (“From the range of possible scenarios that are considered reasonable and likely, the scenario with the worst environmental consequences is chosen for analysis.”).

the SCC in assessing GHG emissions in environmental assessments and impact statements.

Admittedly, this approach toward addressing the CO₂ monetization gap has significant limitations. First, federal agencies are not subject to the mandates of state and municipal reporting requirements.²⁹¹ Thus, integrating the SCC into the reporting requirements of little NEPAs will not capture certain actions of federal agencies and programs, such as the fossil-fuel financing activities of Ex-Im or the federal coal-leasing program. Second, generally, if an action is subject to the EIS requirements of NEPA, state and local agencies are not required to prepare a separate EIS under the relevant little NEPA.²⁹² Despite these limitations, integrating the SCC into little NEPAs could significantly improve environmental reporting at the state and local levels where agencies do not currently contemplate the monetary effects of climate change.²⁹³

Cooperative-federalism schemes in the Clean Air Act provide additional opportunities for states to address the CO₂ monetization gap. Section 110 of the Clean Air Act, for example, requires states to submit and adopt implementation plans (SIPs) ensuring that the state will attain national air quality standards.²⁹⁴ While the enforcement, monitoring, and permitting requirements are firm, states are given considerable flexibility in the specific measures included in SIPs.²⁹⁵ Indeed, so long as a SIP provides for timely attainment and maintenance of air quality standards, EPA must approve it.²⁹⁶ Consequently, a state could require parties to submit an environmental analysis that considers the SCC before it grants new or renewed Clean Air Act permits for projects or facilities.²⁹⁷ In addition, a state could, as a matter of state law, adopt procedures such

291. See, e.g., Dep't of Env'tl. Conservation, *supra* note 288 (explaining that federal agencies are not subject to SEQR).

292. *Id.*

293. The arguments for integrating the SCC into NEPA as a means of better fulfilling the twin aims of NEPA apply analogously in the state context. See *supra* section III.A (furthering the argument that use of the SCC best fulfills the purposes of NEPA).

294. 42 U.S.C. § 7410(a)(2) (2012).

295. See *Train v. Nat. Res. Def. Council, Inc.*, 421 U.S. 60, 98 (1975) (“§ 110(a)(3) requires the Agency to approve ‘any revision’ which is consistent with § 110(a)(2)’s minimum standards for an initial plan . . .”).

296. *Id.*

297. Admittedly, requiring a GHG analysis utilizing the SCC in a SIP for, say, the one-hour sulfur dioxide national ambient air quality standards would be strange given the SIPs' pollutant-specific nature. Still, despite EPA's endangerment finding, EPA has not yet established national ambient air quality standards for GHGs—thus, states are not required to submit GHG-specific SIPs at this time. Greenhouse Gases Threaten Public Health and the Environment, EPA (Dec. 7, 2009), <http://yosemite.epa.gov/opa/admpress.nsf/0/08D11A451131BCA585257685005BF252> [<http://perma.cc/W2UD-N85U>]. Moreover, the case law is unambiguous with respect to states' discretion to impose more strenuous conditions so long as minimum standards are met. E.g., *Train*, 421 U.S. at 98.

that state officials apply the SCC to SIP proposals before they are submitted to EPA for approval.²⁹⁸

Additionally, opportunities exist for states to apply the SCC to the Prevention of Significant Deterioration permitting-approval process.²⁹⁹ For instance, step three of the top-down Best Available Control Technology process requires a reviewing state agency to consider environmental and energy impacts when ranking control technologies by effectiveness.³⁰⁰ States could require that state agencies apply the SCC to projected GHG emissions of a proposed project or modification.

In such ways, states can play an integral role in minimizing the effects of the CO₂ monetization gap irrespective of the inaction at the federal level.

CONCLUSION

The divergence of approaches with respect to how federal agencies consider the effects of GHG emissions in the regulatory cost-benefit and NEPA contexts has led to what this Note labels the CO₂ monetization gap—those federal activities that are subject to NEPA, but not the regulatory cost-benefit analysis mandate, and thus do not use the SCC in examining GHG emissions. The rejection of the SCC under NEPA has led to a subversion of the information-forcing purposes of NEPA, which in turn has contributed to poor decisionmaking in carbon-intensive federal programs, as exemplified by Ex-Im's foreign financing activities. In order to ensure that agencies consider the climate effects of their actions and that the public has a meaningful opportunity to engage in the environmental-decisionmaking process, the SCC must be integrated into NEPA review through CEQ regulation or executive order. In the interim, significant opportunities exist for states to minimize the negative consequences of the CO₂ monetization gap through state programs and existing cooperative-federalism schemes. Only in this way will NEPA's environmental reporting mandate better serve the lofty objectives declared

298. Some states have adopted similar procedures to incorporate the consideration of climate change in state plans to comply with federal environmental laws. Cf. 2016 Mobile Source Strategy, Cal. Air Res. Bd. (May 16, 2016), <http://www.arb.ca.gov/planning/sip/2016sip/2016mobsr.htm> [<http://perma.cc/AR62-BEDR>] (describing how California's strategy to reduce mobile-source GHG emissions will interact with existing plans to meet federal air-quality standards).

299. The PSD program applies to new major sources and major modifications of existing sources of air pollution. It requires the installation of Best Available Control Technology to prevent the degradation of current air-quality standards. See 42 U.S.C. §§ 7470–7479; see also Prevention of Significant Deterioration Basic Information, EPA, <http://www.epa.gov/nsr/prevention-significant-deterioration-basic-information> [<http://perma.cc/7YZW-PFPW>] (last visited Oct. 11, 2017).

300. EPA, "Top-Down" Best Available Control Technology Guidance Document 9–10 (1990) (on file with the *Columbia Law Review*).

by Congress in passing the Act—“to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.”³⁰¹

301. 42 U.S.C. § 4331(a).

