Zeroing Out Climate Change: A "Hard Look" at Trump's Social Cost of Carbon

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Summary

President Donald Trump has referred to climate change as a "hoax," and in March 2017 issued Executive Order No. 13783, Promoting Energy Independence and Economic Growth. Section 5 of this Order directs federal agencies to discontinue use of the social cost of carbon (SCC), a protocol developed under the Barack Obama Administration to monetize the impacts of climate-related disasters and disruption. This directive sets up a conflict with the requirements of NEPA, and likely will be challenged in the courts. This Article argues that, under existing NEPA case law, discontinuation and/or drastic reduction of the SCC by the Trump Administration is likely legally actionable. It examines possible litigation strategies to challenge the expansion of fossil fuels, presents a thorough analysis of Executive Order No. 13783, and offers precedent for NEPA challenges to the SCC rollback.

Climate change has costs. A 2017 study by the U.S. Government Accountability Office (GAO) found that the U.S. federal government spent $350 billion on climate change disasters since 2007.[1] GAO predicted those costs could go as high as $35 billion a year by 2050, with the Southeast facing the highest costs due to coastal property loss.[2] Despite this analysis, and the growing consensus within the U.S. government about the urgency of climate change mitigation and adaptation,[3] the Donald Trump Administration associates with climate denialists,[4] and in March 2017, issued the pro-fossil fuels Executive Order "Promoting Energy Independence and Economic Growth" (Climate EO).[5] The president also announced the Administration's intent to withdraw the United States from the Paris Agreement.[6]

Global temperatures are higher today than at any time in the past 800,000 years.[7] The scientific community agrees that this rise is due to greenhouse gas (GHG) emissions from industrial-scale human activity—notably, land use and the combustion of carbon-based fuels.[8] This carbon pollution has tremendous social costs: more frequent and severe weather-related disasters, the public health effects of excess heat and smog, the displacement of entire cities due to rising seas, water shortage, and famine—and increased political volatility, as economies are disrupted, and life-sustaining resources run dry.[9]

1. U.S. GAO, Climate Change: Information on Potential Economic Effects Could Help Guide Federal Efforts to Reduce Fiscal Exposure (2017) (GAO-17-720), https://www.gao.gov/assets/690/687466.pdf.
2. *Id.*
3. *E.g.*, Donald Wuebbles et al., U.S. Global Change Research Program, Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program (2017), https://assets.documentcloud.org/documents/3920195/Final-Draft-of-the-Climate-Science-Special-Report.pdf.
4. *See, e.g.*, Katie Worth, *Amid U.N. Climate Talks, Trump Officials Attend Event Hosted by Skeptics*, PBS Frontline, Nov. 10, 2017, https://www.pbs.org/wgbh/frontline/article/amid-u-n-climate-talks-trump-officials-attend-event-hosted-by-skeptics/.
5. Exec. Order No. 13783, Promoting Energy Independence and Economic Growth, 82 Fed. Reg. 16093 (Mar. 31, 2017) [hereinafter Climate EO], *available at* https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economi-1.
6. Remarks Announcing United States Withdrawal From the United Nations Framework Convention on Climate Change Paris Agreement, Daily Comp. Pres. Doc. 201700373 (June 1, 2017), https://www.gpo.gov/fdsys/pkg/DCPD-201700373/pdf/DCPD-201700373.pdf.
7. *E.g.*, Intergovernmental Panel on Climate Change, Climate Change 2014, Synthesis Report, Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Rajendra K. Pachauri et al. eds., 2014), http://www.ipcc.ch/report/ar5/syr/.
8. *See, e.g.*, Andrew Griffin, *15,000 Scientists Give Catastrophic Warning About the Fate of the World in New "Letter to Humanity,"* Independent, Nov. 13, 2017, http://www.independent.co.uk/environment/letter-to-humanity-warning-climate-change-global-warming-scientists-union-concerned-a8052481.html.
9. *E.g.*, Craig Welch, *Climate Change Helped Spark Syrian War, Study Says*, Nat'l Geographic, Mar. 2, 2015, http://news.nationalgeographic.com/news/2015/03/150302-syria-war-climate-change-drought/.

Experts and economists have been designing frameworks to quantify, monetize, and forecast those costs for more than a decade.[10] The social cost of carbon (SCC) is the most robust and widely used modeling protocol to forecast the future costs of climate change for human societies writ large. The SCC can be used to assign a dollars-per-ton figure for carbon dioxide (CO_2) pollution, a cost projection that can inform policymakers about the future costs of present-day emissions—and allow them to weigh the future cost savings of limiting those emissions now.[11]

While there is little-to-no leverage for climate advocates in the regulatory arena under President Trump, judicial review of agency action under the National Environmental Policy Act (NEPA)[12] is a pathway for mounting legal challenges to the GHG-intensive projects authorized by the Climate EO. NEPA provides the basis for mandatory environmental impact statements (EIS), which can make the consequences and costs of an action, such as a pipeline or coal lease, transparent to decisionmakers and the public. As increased scientific precision has identified global climate change as an environmental impact, and linked atmospheric carbon concentrations to fossil fuel combustion, courts have consistently held that GHG emissions must be presented in an EIS[13]—and increasingly held that an EIS must also account for so-called downstream emissions of fossil fuel infrastructure projects.[14]

In some recent cases, courts have required a monetization of those downstream emissions costs using the SCC protocol.[15] This set of NEPA precedents is at odds with the Climate EO, which directs agencies to essentially eliminate the SCC.[16] This conflict between the Climate EO and the trend of carbon accounting for downstream emissions creates litigation risks for agencies, and novel legal questions for public interest groups seeking to stop carbon-intensive infrastructure projects. As Dan Farber of Berkley Law School explained:

> [The Administration] might prefer to simply forget about the social cost of carbon, but that may not be an option given judicial rulings . . . To survive judicial review, the agencies will have to have cogent responses to the critiques. If different agencies come up with different estimates, that will undoubtedly complicate their issues in court . . . What all this means is that replacing the old estimates of the social cost of carbon is not going to be an easy task. It may or may not be possible to do so convincingly enough to survive judicial review.[17]

The "MAGA Math" underlying the regulatory repeal of the Clean Power Plan (CPP)[18] is the first SCC figure from the Trump Administration under the new Climate EO regime. Its "domestic SCC" formula slashes the SCC cost per ton of CO_2 by 96%. This change in how the protocol is formulated fundamentally alters the cost-benefit calculus that the protocol was designed to inform. This application of the Climate EO could make the U.S. Environmental Protection Agency (EPA) and other federal agencies vulnerable to lawsuits under the Administrative Procedure Act (APA),[19] because courts have required monetizing GHG emissions since 2008,[20] and the SCC protocol is established as a lawful means for doing so under NEPA.[21] The standard of review under the APA is deferential, and while that deference is "especially strong where the challenged decisions involve technical or scientific matters within the agency's area of expertise,"[22] the court will not "defer to a void."[23] The Climate EO's directive to cease using the SCC could create just such a "void," where there is no sound analytic basis for an agency's calculation—but rather an arbitrary non-explanation.

This Article examines the Climate EO §5, regarding the discontinuation of the SCC protocol[24] and the NEPA case law that has directed agencies to use the SCC, and argues that the president's Executive Order on the SCC is likely unlawful. Part I explains what the SCC is and how it was created, and provides an overview of the Climate EO, NEPA, and related statutes, regulations, Executive Orders, and guidance documents that reference the SCC. Part II provides a thorough chronological review of NEPA case law pertaining to GHG emissions and the SCC. Part III profiles several cases that implicated downstream emissions and the SCC in 2017. Part IV discusses the treatment of the SCC in the draft of the CPP repeal regulatory impact analysis (RIA), and the use of a so-called domestic SCC. Part V concludes with some analysis for lawyers, policymakers, and courts on the critical questions of the SCC and the scope of NEPA in a warming world.

10. *E.g.*, Nicholas Stern, Stern Review: The Economics of Climate Change (2006), http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/sternreview_index.htm.
11. *See infra* Part I.
12. 42 U.S.C. §§4321-4370h; ELR Stat. NEPA §§2-209.
13. *See*, *e.g.*, Border Power Plant Working Group v. U.S. Dep't of Energy 260 F. Supp. 2d 997 (S.D. Cal. 2003) (holding that the "environmental assessment (EA) was inadequate due to failure to disclose and analyze significance of plants' emissions of carbon dioxide," even though the plants were in Mexico, and the operation of the plants was not part of the agency's proposed action).
14. *See* Michael Burger & Jessica Wentz, *Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review*, 41 Harv. Envtl. L. Rev. 109-87 (2016), *available at* https://ssrn.com/abstract=2748702.
15. *E.g.*, High Country Conservation Advocates v. U.S. Forest Serv., 52 F. Supp. 3d 1174, 1189, 44 ELR 20144 (D. Colo. 2014).
16. Climate EO, *supra* note 5, §5.
17. Dan Farber, *Whither the Social Cost of Carbon?*, Legal Planet, May 22, 2017, http://legal-planet.org/2017/05/22/whither-the-social-cost-of-carbon/.
18. Alex Lubben, *EPA Chief Is Using MAGA Math to Justify Repealing Clean Power Plan*, Vice News, Oct. 11, 2017, https://news.vice.com/story/epa-chief-is-using-maga-math-to-justify-repealing-clean-power-plan.
19. 5 U.S.C. §§500-559.
20. *See* Center for Biological Diversity v. National Highway Traffic Safety Admin. (SUV CAFE), 538 F.3d 1172, 1199, 38 ELR 20214 (9th Cir. 2008).
21. *E.g.*, High Country Conservation Advocates v. U.S. Forest Serv., 52 F. Supp. 3d 1174, 1189, 44 ELR 20144 (D. Colo. 2014).
22. Wyoming v. U.S. Dep't of Agric., 661 F.3d 1209, 1246 (10th Cir. 2011) (quoting Morris v. U.S. Nuclear Regulatory Comm'n, 598 F.3d 677, 691, 40 ELR 20072 (10th Cir. 2010)).
23. Oregon Natural Desert Ass'n v. Bureau of Land Mgmt., 625 F.3d 1092, 1121, 38 ELR 20162 (9th Cir. 2010).
24. Climate EO, *supra* note 5, §5, Review of Estimates of the Social Cost of Carbon, Nitrous Oxide, and Methane for Regulatory Impact Analysis.

I. SCC: The Most Important Number You've Never Heard Of

The SCC is a protocol developed by the Barack Obama Administration to quantify and monetize the impacts of GHG emissions. The SCC emerged in the context of hybrid rulemaking, and was developed for RIA. NEPA requires a "hard look" at environmental impacts, which includes direct GHG emissions, and can extend to downstream emissions—and the monetized cost of those emissions. The Climate EO §5 disbands the Interagency Working Group on the Social Cost of Carbon (IWGSCC) and withdraws all guidance documents on the SCC, leaving agencies with potentially conflicting obligations under the Executive Order and NEPA.

A. What Is the SCC?

Often called "the most important number you've never heard of,"[25] the SCC is a framework for attaching dollar figures to the impact of GHG emissions on human societies. In 2009, President Obama created the IWGSCC.[26] The SCC schemata was created for use in rulemaking and regulatory analysis, and is essentially a mash-up and averaging of the three most widely cited predictive models for calculating the economic impact of climate change over the coming decades: the "integrated assessment models" known as DICE, PAGE, and FUND.[27] These models incorporate variables like sea-level rise, land loss, changes in agricultural production, methane emissions, and ocean heating, along with population, gross domestic product, and other tools of economic forecasting, to calculate expected climate damages in economic terms.[28]

The results are variable costs per ton of carbon, depending on which model and which discount rate percentage is used.[29] Discount rates relate to the amount of value attributed to abating the risk today versus paying the projected cost of that liability in the future. The SCC uses 2.5%, 3%, and 5% discount rates, as well as a fourth value that represents the lower-probability but highly catastrophic outcomes (wildcard scenarios), because climate change is inherently prone to those kinds of scenarios, and labels these as the 95th percentile at a 3% discount rate cost.[30] Hence, the SCC ranges between $12 to $123/ton in 2020 (in 2007 US$), and agencies are expected to evaluate at their discretion and to choose among these rates in their calculations. The SCC is not a set price per ton of carbon, but rather a tool to use in evaluating how to monetize GHG impacts, with a wide range of results.

The debate on which discount rate to use is hotly contested amongst economists, and there "is no definitive answer to this question because it is inherently an ethical judgment that requires comparing the well-being of different people: those alive today and those alive in 50 or 100 years."[31] As Obama White House economist Michael Greenstone explained to National Public Radio's (NPR's) *Planet Money* reporter Jacob Goldstein:

> We had estimates. Some of them were big. Some of them were small. And we said the right thing to do here is to take the number that's exactly in the middle. And that number proved to be $36 per ton.
>
> GOLDSTEIN: In other words, emitting one ton of carbon dioxide will cause $36 in damages to the planet. For context, the typical American's carbon footprint is 1 ton every three weeks or so. After Greenstone and his colleagues came up with the number, regulating carbon emissions shifted from being some theoretical debate to being math. And the social cost of carbon started showing up in regulations covering all kinds of things.[32]

The precise SCC price point is debated by experts, with one team at Stanford and University of California, Berkeley arguing in 2015 that the IWG estimates were far too low and the SCC should be $220/ton.[33] The most recent report from the National Academies of Sciences (2017) puts the cost at $42/ton, as per IWG recommendations, and suggests that it be updated every five years to accommodate evolving science and the likelihood of increasing costs.[34] (The Climate EO, however, dissolved the IWGSCC.)

B. Hybrid Context for the SCC: Rulemaking, Executive Order No. 12866, and NEPA

The SCC was designed for use in rulemakings, as a tool for RIA and assessing the costs and benefits of complex regulatory frameworks (e.g., the CPP). Through the IWG,

25. Akshat Rathi, *A Leaked Memo Reveals Trump Could Undo Obama's Climate Legacy by Manipulating a Single Number*, Quartz, Feb. 2, 2017, https://qz.com/901053/the-social-cost-of-carbon-the-most-important-number-youve-not-heard-of-could-soon-be-under-attack-by-climate-change-deniers-in-donald-trumps-administration/.
26. It was renamed the IWG on the Social Cost of GHGs in 2016, to account for methane emissions and other GHGs, but SCC is still the preferred term for the protocol. *See*, *e.g.*, National Academies of Sciences, Engineering, and Medicine, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide (2017) (despite the widened scope of the IWG to the social cost of methane (SCM) and other GHGs, this Article uses the acronym SCC and "social cost of carbon"), *available at* http://www.ourenergypolicy.org/wp-content/uploads/2017/06/24651.pdf.
27. Interagency Working Group on the Social Cost of Greenhouse Gases, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (2016), https://www.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf.
28. *Id.*
29. *Id.* at 4.
30. *Id.*
31. Hal R. Varian, *Recalculating the Costs of Global Climate Change*, N.Y. Times, Dec. 14, 2006, http://www.nytimes.com/2006/12/14/business/14scene.html.
32. Jacob Goldstein, *Federal Court Blocks Challenge to Social Cost of Carbon*, NPR All Things Considered, Aug. 17, 2016, http://www.npr.org/2016/08/17/490387022/federal-court-blocks-challenge-to-social-cost-of-carbon.
33. Ker Than, *Estimated Social Cost of Climate Change Not Accurate, Stanford Scientists Say*, Stanford, Jan. 12, 2015, http://news.stanford.edu/2015/01/12/emissions-social-costs-011215/.
34. National Academies of Sciences, Engineering, and Medicine, *supra* note 26, at 2-3.

the SCC evolved as a creature of the regulatory universe. However, Executive Order No. 12866, which requires a cost-benefit analysis of "significant actions," and NEPA, which requires an analysis of an action's significant effects on the human environment, can also implicate, and/or utilize, the SCC.

The 1992 William Clinton-issued Executive Order No. 12866 requires most agencies to conduct a cost-benefit analysis of regulations, and to include in that analysis adverse impact on the "natural environment."[35] The Executive Order is emblematic of a bipartisan interest in cost-efficient and effective regulation, and was an evolution of President Ronald Reagan's Executive Order No. 12291,[36] which is credited as laying the groundwork for the creation of the SCC.[37] Executive Order No. 12866 was also the precursor to President Obama's Executive Order No. 13563,[38] which has essentially the same mandate. The SCC has evolved as a protocol to comply with a cost-benefit analysis requirement when GHG emissions are a major factor in that cost or benefit projection.

NEPA is a procedural statute enacted in 1970 that prescribes a process for how agencies must account for environmental impacts and engage the public in approval processes for projects that impact the environment. NEPA requires that federal agencies provide a detailed reporting of significant environmental impacts for any proposed major federal action in the form of an environmental assessment (EA) and/or EIS.[39] NEPA does not explicitly require using a cost-benefit framework to conduct these analyses; however, this is often the best practice because of the hybrid administrative law milieu of Executive Order No. 12866.

C. NEPA's "Hard Look" Includes Climate Costs

Since the 1992 Executive Order No. 12866 on cost and benefit, general understanding of the costs and impacts of climate change has steadily increased. Throughout the 1990s and 2000s, debates about the "cost of carbon," "carbon pricing," and a "carbon tax" evolved in academic, policy, and civil society discourses.[40] While the U.S. Congress did not enact any new legislation to regulate GHG emissions domestically, and rejected adoption of the Kyoto Protocol internationally, NEPA remained in effect and—as the impacts of GHGs were more widely accepted—the typical EIS analysis evolved to incorporate climate change.[41]

Where an EIS is required under NEPA, an agency must take a "hard look" at the potential environmental impacts of the proposed action,[42] and "'rigorously explore and objectively evaluate all reasonable alternatives' to a proposed action in comparative form, so as to provide a 'clear basis for choice among the options.'"[43] Since 2003's *Border Power Plant Working Group*, this has come to mean that GHG emissions must be addressed in a "hard look" NEPA analysis,[44] but the scope of the GHG inquiry in terms of "upstream and downstream emissions" is still evolving and contested.[45]

NEPA does not explicitly require a cost-benefit analysis in an EIS. In 2014, EPA advised the State Department to use the SCC protocol in the Keystone XL pipeline draft supplemental EIS, but the State Department declined, citing NEPA's silence on cost-benefit analysis.[46] However, it is firmly established in the courts. that an EIS cannot simultaneously "trumpet an action's benefits" while undervaluing costs.[47] Hence, when a cost-benefit analysis is present, which it often is for "significant actions" because of Executive Order No. 12866 requirements, NEPA requires that analysis to be balanced, and so the use of the SCC protocol is used to monetize the costs of GHGs and/or the benefits of GHG reductions.

In 2016, President Obama's Council on Environmental Quality (CEQ) issued GHG guidelines that expanded across all federal agencies and actions, including resource extraction and land management, and directed incorporation of "reasonably foreseeable direct and indirect emissions" into NEPA analysis.[48] This nonbinding guidance on downstream emissions also noted that cost-benefit analysis is not explicitly required by NEPA, and that cost-benefit analysis is only useful insomuch as it provides policymakers and the public with a choice among alternatives. However, as per Executive Order No. 12866, accounting for the costs and benefits of regulations is required for actions with

35. Exec. Order No. 12866, Regulatory Planning and Review, 58 Fed. Reg. 51735 (Oct. 4, 1993).
36. Exec. Order No. 12291, Federal Regulation (Feb. 17, 1981), https://www.archives.gov/federal-register/codification/executive-order/12291.html.
37. *The Social Cost of Carbon Timeline*, Carbon Brief (2017), https://www.carbonbrief.org/qa-social-cost-carbon.
38. *Presidential Executive Order on Improving Regulation and Regulatory Review* (Jan. 18, 2011), https://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf.
39. *E.g.*, Linda Luther, Congressional Research Service, The National Environmental Policy Act: Background and Implementation (2008).
40. *E.g.*, Nicholas Stern, *supra* note 10; but see, for example, critique from the left, Steffen Böhm et al., *Greening Capitalism? A Marxist Critique of Carbon Markets*, 33 Org. Stud. 1617-38 (2012), http://repository.essex.ac.uk/5369/1/Boehm_et_al_-_proof.pdf, and a critique from the right, Robert P. Murphy et al., *The Case Against a U.S. Carbon Tax*, Cato Inst., Oct. 17, 2016, https://www.cato.org/publications/policy-analysis/case-against-us-carbon-tax.
41. *E.g.*, Border Power Plant Working Group v. U.S. Dep't of Energy, 260 F. Supp. 2d 997, 1000 (S.D. Cal. 2003).
42. Robertson v. Methow Valley Citizens Council, 109 S. Ct. 1835, 19 ELR 20743 (1989).
43. WildEarth Guardians v. U.S. Forest Serv., 828 F. Supp. 2d 1223, 1236 (D. Colo. 2011) (quoting 40 C.F.R. §1502.14 (2011)).
44. *Border Power Plant Working Group*, 260 F. Supp. 2d at 1000.
45. *E.g.*, Burger & Wentz, *supra* note 14.
46. *See* Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State, Final Supplemental Environmental Impact Statement for the Keystone XL Project: Volume V—Comments and Responses (Part 1) PC-7 (2014) [hereinafter Keystone XL Final Supplemental EIS].
47. *E.g.*, Sierra Club v. Sigler, 695 F.2d 957, 979, 13 ELR 20210 (5th Cir. 1983).
48. Memorandum From Christina Goldfuss, Chair, CEQ, to the Heads of Federal Departments and Agencies (Aug. 1, 2016) (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) [hereinafter 2016 CEQ Guidance]; *see* 81 Fed. Reg. 51866 (Aug. 5, 2016), *available at* https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf.

major economic impact over $100 million or other "significant regulatory actions,"[49] so actions are often implicated.

D. GHG Cost-Benefit Under the Climate EO

The Climate EO §5 rescinds the 2016 CEQ guidance on downstream emissions and all guidance documents on the SCC as "no longer representative of government policy," and directs agencies to instead use the George W. Bush Administration-era OMB Circular A-4[50] when monetizing GHGs, creating a complex and conflicting set of directives. Circular A-4 offers only general guidance on presenting costs and benefits in accordance with Executive Order No. 12866 and its progeny. General directives include the following: "Include separate schedules of monetized benefits and costs . . . List the benefits and costs you can quantify, but cannot monetize, including their timing . . . and identify or cross-reference the data or studies on which you base the benefit and cost estimates."[51]

Circular A-4 offers no direct guidance on monetizing GHG emissions or accounting for GHGs in a cost-benefit analysis, although this generalized guidance could be applied to GHGs. The one mention of climate change in the document is in a discussion of the treatment of uncertainty: "incomplete knowledge about the relevant relationships (for example, the uncertain knowledge of how some economic activities might affect future climate change)." The guidance goes on to explain that uncertainties must be assessed to "shape your analysis to inform decision makers and the public about the effects and uncertainties of alternative regulatory actions," and "your analysis should be credible, objective, and scientifically balanced."[52] Hence, Circular A-4 does not mandate the use of any analytical metric or framework akin to the SCC, but rather treats the relationship between economic activities and climate change as an unknown—albeit one that should be objectively assessed—and generally advises monetizing, or at least quantifying, costs and benefits.

Agencies are caught in a snarl of conflicting mandates. The Climate EO §5 is at odds with precedent holding that carbon has a quantifiable social cost, that carbon cutbacks have social benefits that can be monetized, and that these dollars must be accounted for in a NEPA analysis that touts the costs and benefits of a GHG-emitting (or GHG-reducing) federal action.[53] Further, declining to produce a figure for GHG impacts in a NEPA analysis that presents costs and benefits (and thereby making the projected carbon cost of the action a de facto $0) has been established by courts as unlawful under NEPA, and those courts have cited the SCC as a proper protocol for NEPA compliance.[54]

To comply with the Climate EO, federal agencies must use a cost-benefit analysis in the EIS to show that economic benefits outweigh costs of the action.[55] To comply with NEPA, that same agency cannot simultaneously use a cost-benefit analysis and ignore the GHG costs (essentially creating a cost of $0); the EIS will need to show realistic, science-backed monetization of GHG impacts.[56] But—as per the Climate EO §5—the agency cannot use the SCC protocol to calculate that monetization of GHG impacts. Federal agencies are left with two options: (1) leave a GHG impacts cost out of NEPA analysis entirely, and risk litigation (the "de facto $0" scenario); or (2) create a new carbon accounting protocol that makes the price point lower, as per the "domestic SCC" floated in the draft CPP RIA,[57] which could likewise trigger litigation for arbitrary and capricious gaming of the GHG monetization framework

To comply with Executive Order No. 12866 and NEPA, with the guidance of Circular A-4, agencies under President Bush had to provide a cost-benefit analysis in an EIS, with monetization where possible, quantification where possible, and data to inform assessment of uncertainty. The return to Circular A-4 under President Trump without the SCC as a framework for monetization means that "without additional guidance, in order to comply with Executive Orders Nos. 21866 and 13783 [the Climate EO], and NEPA requirements, federal agencies will likely still need to determine how to assess the climate-related costs and benefits associated with rulemakings."[58] The context of NEPA case law since 2008 provides the backdrop for this warning.

University of Chicago economist Michael Greenstone, a key architect of the SCC in the Obama Administration, explained:

> This is not the first time people have come hunting for the social cost of carbon . . . Industry groups have challenged it in court, but judges have tended to find the concept sound. For reasons of law and science, it looks like a very bumpy, windy road to me to greatly reduce the social cost of carbon.[59]

49. U.S. EPA, *Summary of Executive Order 12866—Regulatory Planning and Review*, https://www.epa.gov/laws-regulations/summary-executive-order-12866-regulatory-planning-and-review (last updated Dec. 19, 2017).
50. OMB, Circular A-4, Regulatory Analysis (Sept. 17, 2003) [hereinafter Circular A-4].
51. *Id.* at 11.
52. *Id.* at 24.
53. *See* High Country Conservation Advocates v. U.S. Forest Serv., 52 F. Supp. 3d 1174, 1189, 44 ELR 20144 (D. Colo. 2014).
54. *E.g.*, Center for Biological Diversity v. National Highway Traffic Safety Admin. (SUV CAFE), 538 F.3d 1172, 1199, 38 ELR 20214 (9th Cir. 2008).
55. Climate EO, *supra* note 5, §1(c).
56. *E.g.*, *SUV CAFE*, 538 F.3d 1172.
57. *See infra* Part IV.
58. *New Executive Order Directs Agencies to Revise or Rescind Climate Change Rules and Policies*, CRS Rep. & Analysis Legal Sidebar, Apr. 20, 2017, https://fas.org/sgp/crs/misc/eo-rescind.pdf.
59. Malakoff et al., *Trump Team Targets Changes to Key Metric That Calculates Social Cost of Carbon*, Science, (Dec. 16, 2016, 2:30 PM), http://www.sciencemag.org/news/2016/12/trump-team-targets-changes-key-metric-calculates-social-cost-carbon.

II. The Social Cost of Carbon in the Courts

The SCC has been evolving in the courts as an important strand of regulatory analysis and NEPA compliance for the past 10 years. Beginning with the 2008 U.S. Court of Appeals for the Ninth Circuit case regarding fuel economy standards for sport utility vehicles (SUVs), the SCC has cropped up as a key element in GHG-related litigation—from coal mines to timber sales, refrigeration regulations to pipelines, and fossil fuel exports. The following case studies chronicle the evolution of the SCC in the courts from 2008 to 2018, demonstrating the growing trend of quantification and monetization of GHG emissions, and the SCC as the primary protocol for achieving it.

A. The Ninth Circuit: "Certainly Not Zero"

Climate-protective plaintiffs have successfully litigated the question of carbon's costs, and the value of emissions reductions, since 2008. While the Climate EO disbands the IWGSCC and directs agencies to use Circular A-4 as a framework for regulatory analysis, this order is on its face inconsistent with *Center for Biological Diversity v. National Highway Traffic Safety Administration* (*SUV CAFE*), a Ninth Circuit decision that essentially held that carbon emissions must be monetized in regulatory analysis, even under the Circular A-4 framework of that era, and implied a requirement of carbon impact monetization when a cost-benefit framework is part of the NEPA analysis.

In 2008, the Center for Biological Diversity—along with 11 states, the District of Columbia, several cities, and other public interest organizations—challenged a rulemaking by the Bush Administration's National Highway Traffic Safety Administration (NHTSA) on corporate average fuel economy (CAFE) standards. The rule governed gas mileage requirements for SUVs in model years (MY) 2008-2011, and was developed by NHTSA under the Circular A-4 guidance of that era. In *SUV CAFE*, environmental organizations claimed that the draft EA was fundamentally inadequate in its treatment of GHGs and global warming, which received only "a few boilerplate paragraphs,"[60] and that the final EA[61] fell far short of the "hard look" required by NEPA.[62]

Environmental organizations cited a range of figures for estimated GHG impacts in their NEPA comments on the EA, spanning $7-$47/ton CO_2, arguing that these monetized benefits of emissions reductions should be included in the government's analysis.[63] NHTSA's position was that the benefits of GHG reductions were "too uncertain to support their explicit valuation and inclusion" and "the agency determined the stringency of that standard on the basis of monetized net benefits."[64] In oral argument, Judge Michael Daly Hawkins pressed the government's counsel on this point in particular: "Let's go to the chase, what's the justification for assigning zero value to CO_2 reduction?," with NHTSA's counsel offering, "[T]he agency did not a [sic] zero value, it concluded there was no way to assign any monetary value."[65]

The Ninth Circuit "failed to see the difference" between zero and "no way to monetize."[66] Although the data offered in the EA comments on carbon's cost indicated a range of price points, the court was convinced that the "[p]etitioners have shown that it is possible to monetize the benefit of carbon emissions reduction."[67] *SUV CAFE* held that NHTSA was arbitrary and capricious in its failure to account for the benefits of reduced carbon emissions in the cost-benefit analysis of its EA, famously stating that despite the speculative range of dollar values proposed by various experts—which the government claimed created too much uncertainty to make a precise calculation—"the value of carbon emissions reduction is certainly not zero."[68] The court soundly rejected the government's position, holding that NHTSA could not "put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent [fuel economy] standards" in the cost-benefit analysis of an EA.

SUV CAFE was a shot across the bow of federal agencies and GHG-polluting industries: if an agency presented costs and benefits of an action in an EA or EIS, in accordance with Executive Order No. 12866 and the Circular A-4 guidance, NEPA compliance would also require monetizing carbon emissions as part of that calculation—and specifically calculating and monetizing the *benefits of emissions reductions*. This meant that the value of reducing GHGs could be compared to other monetized benefits included in such analyses, such as job creation or increased public safety, and more stringent regulation of GHGs could not only be tallied in the "cost" column.

The Bush Department of Transportation rolled the disputed 2011 SUV rule into its next round of CAFE rulemaking, dodging the question of GHG costs. In January 2009, newly inaugurated President Obama issued a memorandum requesting NHTSA to split that CAFE rulemaking into two parts,[69] meaning that the disputed NHTSA CAFE standards for MY 2011 light trucks would be made immediately as a stand-alone rule, and the MY 2012-2015 rule would be made separately.[70]

60. Brief for Petitioner at 22, SUV CAFE, 538 F.3d 1172, 1199, 38 ELR 20214 (9th Cir. 2008) (No. 06-71891).
61. U.S. Department of Transportation, Final Environmental Assessment: National Highway Traffic Safety Administration Corporate Average Fuel Economy (CAFE) Standards (2006), https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/2006_ea.pdf.
62. SUV CAFE, 538 F.3d 1172, 1199 (9th Cir. 2008).
63. *Id.*
64. *Id.* at 1200 (citing 71 Fed. Reg. 17566, 17638 (Apr. 6, 2006)).
65. Transcript of Oral Argument, SUV CAFE, 538 F.3d 1172, 1199 (9th Cir. 2008) (No. 06-71891).
66. *Id.*
67. *SUV CAFE*, 538 F.3d at 1200.
68. *Id.*
69. Memorandum on the Energy Independence and Security Act of 2007, Daily Comp. Pres. Doc. 2009000024 (Jan. 26, 2009), https://www.gpo.gov/fdsys/pkg/DCPD-200900024/pdf/DCPD-200900024.pdf.
70. Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011; Final Rule, 74 Fed. Reg. 14196 (Mar. 30, 2009), *available at* https://www.gpo.gov/fdsys/pkg/FR-2009-03-30/pdf/E9-6839.pdf.

The final 2011 rule was published March 30, 2009, and—in accordance with the *SUV CAFE* holding—devoted 14 pages to an analysis of the SCC, citing various sources such as the Intergovernmental Panel on Climate Change, the Volpe model, and comments by the *SUV CAFE* petitioners.[71] However, in the end, the agency dodged the key issue of the dollar-per-ton amount:

> [I]n view of the significance that announcing the selection of either a domestic or global value in this rulemaking might have in the context of ongoing legislative activities and international negotiations, we are deferring the choice between a domestic SCC and a global SCC and, for the appropriate choice, the monetized value for the benefit of reduction, until the next CAFE rulemaking. This will provide the time necessary for more refined analysis and for the various affected federal agencies to work together and identify a consistent value for use in their respective regulatory and policy-making activities.[72]

The subsequent NHTSA rule for MY 2012-2016 on fuel economy standards used the (global) SCC and assigned the global value of $21/ton CO_2, creating a value of $14.5 billion from the emissions reductions.[73] Subsequent rules also used the SCC, in line with various guidance and technical assistance documents issued by the Obama White House during that Administration.

President Trump's 2017 Climate EO §5 states that the SCC is "no longer representative of government policy."[74] The order "disbands" the IWGSCC and directs agencies to instead use the Bush Administration-era Circular A-4 when monetizing GHGs.[75] This move is at odds with the *SUV CAFE* carbon monetization holding, and its progeny, which have extended the reach of monetization with several courts' acceptance of the SCC as the appropriate protocol for monetizing GHGs in NEPA analysis.

B. High Country: *A "Growing Hurdle" for Fossil Fuels*

High Country Conservation Advocates v. U.S. Forest Service is the most notable example of the SCC taking root in NEPA case law post-*SUV CAFE*. In this case, the court held that the Forest Service's deletion of the SCC in its final EIS was arbitrary and capricious, leading industry analysts to speculate that the SCC could be a "growing hurdle for fossil fuels."

Prior to 2014, the SCC was not used in NEPA analysis, as it was designed for regulatory analysis and larger policy decisionmaking (e.g., CAFE or the CPP). As explained above, NEPA does not require cost-benefit analysis per se. For example, EPA advised the State Department to use the SCC protocol in the Keystone XL pipeline draft supplemental EIS, but the State Department declined, citing NEPA's silence on cost-benefit analysis.[76] *SUV CAFE* turned in part on the SCC in the disputed EA (and so was in part a NEPA holding), and the subsequent 2012 rule included the SCC, but the CAFE rulemaking is economically significant and therefore also falls under the monetization requirements of Executive Order No. 12866.

The EIS at issue in *High Country*[77] involved a coal lease modification on U.S. Forest Service lands in the Sunset Roadless Area of Colorado that would authorize coal exploration, and potentially create new coal mines.[78] The Forest Service prepared a draft EIS that used the SCC to disclose projected emissions and their cost: a $6.9 million monetized GHG impact (at a rate of $21/ton CO_2).[79] An economist with the Bureau of Land Management (BLM) then e-mailed the Forest Service to comment that the SCC is "controversial," and explained that "the cost [at the adjacent West Elk mine] would range from a moderate $6 million per year to an overwhelming $984 million per year."[80] Seemingly in response to this e-mail, the Forest Service deleted the SCC, and all quantification of GHG impact, from the final EIS.[81]

Much like the position of NHTSA in *SUV CAFE*, the Forest Service's final EIS position in *High Country* relied on a "categorical explanation" that an analysis of the climate impacts is "impossible," which the court held as arbitrary and capricious, in violation of NEPA.[82] In an echo of the colloquy in *SUV CAFE*, Judge R. Brooke Jackson pointed out that "neither the BLM's economist nor anyone else in the record appears to suggest that the cost is as low as $0 per unit."[83]

The Forest Service omitted the previously mentioned SCC estimates in the final EIS without explanation, while retaining (and even enhancing) a discussion of the economic benefits of the project.[84] Judge Jackson explained in the opinion that it is not

> reasonable completely to ignore a tool in which an interagency group of experts invested time and expertise. Common sense tells me that quantifying the effect of greenhouse gases [methane and carbon] in dollar terms is difficult at best. The critical importance of the subject, however, tells me that a "hard look" has to include a "hard look" at whether this tool, however imprecise it might be, would contribute to a more informed assessment of the impacts than if it were simply ignored.[85]

71. *Id.*
72. *Id.* at 14351.
73. Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25324 (May 7, 2010).
74. Climate EO, *supra* note 5.
75. *Id.*
76. *See* Keystone XL Final Supplemental EIS, *supra* note 46, at PC-7.
77. High Country Conservation Advocates v. U.S. Forest Serv., 52 F. Supp. 3d 1174, 1189, 44 ELR 20144 (D. Colo. 2014).
78. *Id.* at 1183.
79. *Id.* at 1191.
80. *Id.* (quoting E-mail From D. Epstein, Economist, BLM State Office, to N. Mortenson, Forest Service (July 19, 2012)).
81. *Id.*
82. *Id.* at 1190.
83. *Id.* at 1192.
84. *Id.* at 1190.
85. *Id.* at 1193.

Judge Jackson also opined on the rule regarding NEPA "post hoc rationalizations" under *Richardson*: "In considering whether the agency took a 'hard look,' we consider only the agency's reasoning at the time of decision-making, excluding post-hoc rationalization concocted by counsel in briefs or argument."[86] The post-hoc arguments in *High Country* for why the SCC appeared in the draft EIS, and then disappeared in the final EIS, "further illustrate the arbitrariness."[87]

One of those post-hoc rationalizations was that the SCC is designed for rulemakings, not NEPA analysis,[88] which Judge Jackson rebutted with the EPA endorsement of the SCC in other contexts.[89] Given that the Trump Climate EO withdraws the CEQ guidance on the SCC, this argument may reemerge in future NEPA litigation as the Administration argues that the SCC is not for use in NEPA (or any context), even as monetizing impact is still presumably suggested under Circular A-4.

High Country was a potential game-changer for the fossil fuel industry that could make the costs of downstream GHG emissions transparent to the public in a way that may bolster new regulation, or even termination, of carbon-intensive actions. After *High Country*, it was possible that the Obama White House would clarify and strengthen its position on the SCC as the standard protocol for use in NEPA review. But the 2016 CEQ guidance mentioned the SCC only in a footnote as an "example" of how to monetize benefits, and deferred to agencies' discretion on the best methods for their own cost-benefit analyses.[90] This position left agencies without a "roadmap" for using the SCC in the shadow of the emerging case law, leading industry analysts to forecast that:

> [i]ncorporation of the SCC and SCM [social cost of methane] methodologies into NEPA analysis . . . may stand as a substantial and growing hurdle to fossil fuel energy extraction and usage . . . [and] may lead to expanded climate change and GHG emissions analysis in environmental impact statements in particular . . . agencies concerned about litigation risk will likely be eager to "check the boxes" in their NEPA analyses to minimize risk of lawsuits.[91]

The bigger picture on *High Country* relates to the solvency of coal companies. Prior to the Trump Administration, *High Country* led carbon policy consultants at Element VI Consulting to speculate that the holding could foreshadow the end of the coal industry, at least in the Powder River Basin (PRB):

> *High Country* could have enormous consequences for Powder River Basin coal. Most PRB coal is on federal land, and (due to its lower quality) PRB coal is extremely cheap ($12.50/ton) compared to bituminous ($44.50-$64.50/ton). When burned, a ton of PRB coal releases about 2 tons of CO_2. Given the latest global SCC estimate of $33/ton, it will become increasingly difficult for the government to justify strip mining federal land for coal with a market value of $12.50 that will cause $66 in damage (not including the emissions associated with mining and transportation). Even using the much lower "domestic only" SCC, would make it questionable. Now, as the judge grapples with the question as to what exactly he should order the defendants to do to fix this violation, it is not surprising that the federal defendants have said that "the questions of what remedy is appropriate and what courses of action the Agencies may need to take are quite complicated and require policy decisions at high levels." It will also be interesting to see how this plays out in terms of coal companies' asset valuation: As we have noted before, right now, coal companies are booking upwards of 40 years of PRB production from federal lands as assets; a true paradigm shift in U.S. coal policy would ensue if the Feds begin to exercise their rights to review/terminate these leases. (And just wait till the plaintiffs' securities lawyers see—and understand—this.) Stay tuned.[92]

Despite the concern about the SCC as a potential impediment to fossil fuel development, the *High Country* fact pattern was distinguished in subsequent cases. Nevertheless, the SCC has survived several important challenges since 2015.

C. *Carbon Storage: The SCC Not Applied in Salvage Logging Case*

The 2015 case *League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Connaughton* deferred to the Forest Service on its decision not to use the SCC, with the well-worn rationale that scientific uncertainty prevented monetization.[93] The relevant aspect of the NEPA challenge involved post-fire salvage logging in Oregon, with the plaintiffs arguing that the logging would diminish the forest's carbon storage capacity, a cost that had not been adequately contemplated by the EIS using the SCC.[94]

The court reasoned that the science of carbon sequestration in this situation was speculative, and therefore monetization was impossible—whereas in *High Country* "the agency's behavior was arbitrary and capricious because it quantified the benefits but claimed that it was impossible to quantify the costs, 'when such an analysis was in fact

86. *Id.* at 1192 (quoting New Mexico ex rel. Richardson v. Bureau of Land Mgmt., 565 F.3d 683, 704 (10th Cir. 2009)).
87. *Id.*
88. *Id.*
89. *Id.* at 1190 (citing Sarah E. Light, *NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 Tul. L. Rev. 511, 545-46 n.160 (2013) (noting that EPA recommended the State Department "explore . . . 'social cost of carbon' associated with" the Keystone XL pipeline)).
90. 2016 CEQ Guidance, *supra* note 48, at 33 (see note 86 in the guidance).
91. *Id.* at 2, 10.
92. Element VI Consulting, Coal Woes and NEPA, *available at* https://web.archive.org/web/20170127094330/http://elementviconsulting.com/coal-woes-and-nepa/.
93. League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Connaughton, No. 3:12-cv-02271-HZ, 2014 WL 6977611 (D. Or. Dec. 9, 2014), *appeal dismissed*, No. 15-35427 (9th Cir. Oct. 20, 2015).
94. *Id.* at *26.

possible,' and was included in the draft EIS."[95] For the Oregon court, the facts of the two cases were very different—with *High Country* being a clear case of arbitrariness manifested by the inconsistencies in the drafts, whereas in this case,

> [p]laintiffs have not carried their burden on this particular issue to show that the Forest Service lacked scientific integrity. The Forest Service engaged in a qualitative discussion about the effects of the Project on climate change, while acknowledging the limitations of current science in this regard. 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.[96]

The environmental groups did appeal this case to the Ninth Circuit, but not on the SCC issue, so there was no further review of that holding. As the science of carbon drawdown and carbon sequestration continues to evolve and influence policy (e.g., in California's cap-and-trade scheme[97]) this issue of carbon storage will likely reemerge as central to GHG impact analysis and NEPA compliance, and will result in further litigation.

D. Zero Zone: *The SCC Survives Industry Challenge in the Tenth Circuit*

In 2016, the SCC survived a key legal challenge from industry in the regulatory context. In August 2016, the commercial refrigeration industry challenged the U.S. Department of Energy (DOE) in the U.S. Court of Appeals for the Tenth Circuit on its use of the SCC in efficiency regulations—and lost. *Zero Zone v. U.S. Department of Energy* held that DOE was due deference in its use of the SCC protocol to guide energy-efficiency regulations for that industry.[98] The court stated:

> DOE . . . found that the reduction of carbon over thirty years would have long term effects on the environment but that the increased costs over thirty years would not have long term effects on employment. The petitioners may disagree with the merits of DOE's conclusion, but DOE's analysis is neither arbitrary nor capricious.[99]

In 2016, experts suggested *Zero Zone* would likely not reach the U.S. Supreme Court.[100]

E. *The "LNG-Terminal Trilogy": The SCC Not Applied to Fracked Gas Exports*

While *Zero Zone* upheld agency deference when agencies use the SCC, the 2016 U.S. Court of Appeals for the District of Columbia (D.C.) Circuit case *EarthReports v. Federal Energy Regulatory Commission* upheld agency deference when the Federal Energy Regulatory Commission (FERC) declined to use the SCC.[101] *EarthReports* was part of what the same court later called the "LNG-terminal Trilogy,"[102] a series of three separate cases involving liquefied natural gas (LNG) export terminal conversions, in which environmental groups argued for NEPA analysis of downstream GHG impacts (i.e., quantification of the emissions from the eventual combustion of the exported fracked gas). That argument collapsed in all three cases on the grounds that DOE, not FERC, has the ultimate authority to regulate those exports: "FERC had no legal authority to consider the environmental effects of those exports, and thus no NEPA obligation stemming from those effects."[103]

However, in *EarthReports*, the EIS challenge was also mounted on grounds that the SCC "or a similar analytical tool" should have been used in the NEPA analysis of the construction and operation of the terminal itself, for which FERC was responsible.[104] FERC successfully relied on the argument that the SCC is too unwieldy and inaccurate for NEPA analysis, and—since there are no other tools available—a monetization of GHG impacts was not possible. The court ultimately deferred to FERC on its prerogative not to use the SCC:

> The Commission acknowledged the availability of the "social cost of carbon" tool, but, in its opinion concluded that, "it would not be appropriate or informative to use for this project" for three reasons: the lack of consensus on the appropriate discount rate leads to "significant variation in output[,]" the tool "does not measure the actual incremental impacts of a project on the environment[,]" and "there are no established criteria identifying the monetized values that are to be considered significant for NEPA purposes." Petitioners' response, that the Commission 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. As for using other tools, the Commission observed that "there is no standard methodology to determine how a project's incremental contribution to [greenhouse gas emissions] would result in physical effects on the environment, either locally or globally."[105]

95. *Id.*
96. *Id.* at *27.
97. *See* Rob Jordan, *Allowing Polluters to Offset Carbon Emissions by Paying Forest Owners Effectively Reduces Greenhouse Gases, Stanford Study Finds*, Stanford, Aug. 14, 2017, http://news.stanford.edu/2017/08/14/carbon-offsets-wide-ranging-environmental-benefits/.
98. Zero Zone v. U.S. Dep't of Energy, 832 F.3d 654, 679 (10th Cir. 2016).
99. *Id.*
100. Jay Michaelson, *The "Social Cost of Carbon" Is the Most Historic Climate Change Decision Yet*, Daily Beast, Aug. 30, 2016, http://www.thedailybeast.com/the-social-cost-of-carbon-is-the-most-historic-climate-change-decision-yet.
101. EarthReports v. Federal Energy Regulatory Comm'n, 828 F.3d 949, 956 (D.C. Cir. 2016).
102. Sierra Club v. Federal Energy Regulatory Comm'n, No. 16-1329, 2017 U.S. App. LEXIS 15911, at *21, 47 ELR 20104 (D.C. Cir. Aug. 22, 2017) (Southeast Market Pipeline).
103. *Id.* (relying on U.S. Dep't of Transp. v. Public Citizen, 541 U.S. 752 (2004)).
104. *EarthReports*, 828 F.3d at 956.
105. *Id.* (internal citations omitted).

This holding in *EarthReports* has already become an important precedent. In the remand of the EIS in *Sierra Club v. Federal Energy Regulatory Commission* (*Southeast Market Pipeline*) in 2017, the D.C. Circuit tasked FERC with "explain[ing] in the EIS, as an aid to the relevant decision makers, whether the position on the Social Cost of Carbon that the agency took in *EarthReports* still holds, and why."[106]

Under the Climate EO, FERC's *EarthReports* logic—that the SCC is just plain inaccurate—will likely be the government's go-to position on SCC NEPA challenges. However, *EarthReports* is clearly at odds with *SUV CAFE* and *High Country*, which both rejected the notion that just because monetization was difficult, the cost of emissions is not zero—and held that the SCC is an appropriate protocol for creating a monetized assessment of GHG impact. As the *EarthReports* court pointed out, there is no other tool available for this purpose, so the Climate EO's directive to not use the SCC—and yet still ensure that benefits outweigh costs—seems to create a conflicting mandate for agencies operating under NEPA.

F. Tenth Circuit Rejects Perfect Substitution, Says Climate Is Not a "Frontier of Science"

WildEarth Guardians v. U.S. Forest Service involved the same PRB coal leases that Element VI was flagging in 2014.[107] In 2015, the district court essentially ignored the SCC issue, with the rationale that the PRB coal was "destined for sale in the open market,"[108] making quantification of the precise GHG impact impossible.[109] This reasoning is known as the "perfect substitution argument"—meaning that, if coal is not mined here, equivalent coal will be mined and burned somewhere else, so there is no quantifiable GHG impact in the global scheme of things, and there would be no net decrease in emissions if the action were not pursued.[110] As Michael Burger and Jessica Wentz explain in their 2017 *Harvard Environmental Law Review* article:

> WildEarth Guardians asserted that BLM provided "no information or analysis" to support its conclusion that emissions would not change under the no-action alternative, and that the BLM has ignored economic analysis to the contrary as well as recent case law rejecting the "perfect substitute" argument. But the court apparently misunderstood this aspect of the plaintiff's brief.[111]

The Tenth Circuit, however, understood—and reversed.[112] In September 2017, Judge Mary Beck Briscoe roundly rejected the perfect substitution argument, remanding with instructions to BLM to revise the EIS accordingly, and charging the district court with fashioning other appropriate remedies, which may include the vacating of the PRB leases.[113] Calling BLM's logic "contrary to basic supply and demand principles,"[114] the court agreed with WildEarth that declining to renew/expand the PRB coal leases would result in lower GHG emissions, because removing nearly 20% of the nation's coal supply from the market would drive up the price of coal, thereby incentivizing power generation from alternative sources of energy.[115]

Significantly, the Tenth Circuit also declared that climate change did not involve "frontiers of science"[116]—meaning that BLM was not thereby entitled to the deference due to agencies in their particular realm of expertise—and pointed out that climate modeling programs are widely available to agencies to forecast GHG emissions, and their impacts.[117] This is a significant aspect of the holding that will likely emerge in other contexts as the Trump Administration moves forward on fossil fuel projects and operationalizes its "climate denier" platform through agency actions. This aspect of the holding was critiqued by Judge Bobby Baldock in his concurrence, in which he asserted that anthropogenic warming is "questionable as a factual matter,"[118] as he opined that it is not the role of judges to question the determinations of agencies on this issue.[119]

While WildEarth did not appeal the SCC question, but rather the broader issue of the perfect substitution argument and downstream emissions, once downstream emissions (or emissions reductions) are quantified—as they were here at 382 million tons CO_2—that could trigger a monetization requirement of those GHG impacts under NEPA using the SCC. At the rate of \$42/ton CO_2 (recommended by the 2017 National Academies of Sciences report),[120] the SCC would total \$16.44 billion for the project. This simple math proves Element VI's point that the SCC, even using conservative estimates, is a real threat to the continued viability of PRB coal,[121] and perhaps the entire fossil fuel industry.

III. 2017: Downstream Emissions Are "Something of a Trend"

WildEarth's Tenth Circuit appeal victory was not the only successful NEPA attack on PRB coal using the SCC in 2017, and the overall trend has been to remand, requiring quantification and monetization of downstream emissions.

106. *Southeast Market Pipeline*, 2017 U.S. App. LEXIS 15911, at *27.
107. WildEarth Guardians v. U.S. Forest Serv., 120 F. Supp. 3d 1237, 1271 (D. Wyo. 2015).
108. *Id.* at 1272.
109. *Id.* at 1273.
110. Burger & Wentz, *supra* note 14, at 150.
111. *Id.* at 152 & nn.204, 207.
112. WildEarth Guardians v. Bureau of Land Mgmt., No. 15-8109, 2017 U.S. App. LEXIS 17888, at *34 (10th Cir. Sept. 15, 2017).
113. *Id.*
114. *Id.* at *24
115. *Id.* at *20.
116. *Id.* at *26.
117. *Id.*
118. *Id.* at *37.
119. *Id.*
120. National Academies of Sciences, Engineering, and Medicine, *supra* note 26.
121. Element VI Consulting, *supra* note 92.

A. Montana Coal Mine Enjoined on SCC Grounds

Relying on *High Country*, the Montana district court remanded the EA on a coal mine expansion project, and went so far as to enjoin the operations of the mine, pending compliance with NEPA.[122] In *Montana Environmental Information Center v. U.S. Office of Surface Mining*, the plaintiff's winning argument was that the mining plan EA touted the project's economic benefits, and quantified downstream emissions at 23.16 million tons of GHGs, but did not use the SCC to monetize those costs.[123] The court agreed this was arbitrary and capricious, and distinguished the facts in *Montana Environmental Information Center* from the facts in the *Connaughton* salvage logging case, noting that in *Connaughton*, the Forest Service did not undertake quantitative analysis of either the benefits or the costs, whereas here the U.S. Office of Surface Mining (OSM) did, and therefore could not inflate benefits while omitting costs.[124]

OSM projected a potential annual tax revenue from the expanded mine of $23.816 million for the state of Montana.[125] Calculated at the 2017 National Academies of Sciences' recommended SCC price point of $42/ton CO_2, the downstream emissions of the project would have a social cost of $972.72 million—again revealing the losing hand that is PRB coal.

OSM unsuccessfully relied on a sort of hybrid rationale of perfect substitution and its close cousin, infinitesimal impact (meaning that the emissions are inconsequential compared to the global GHG problem).[126] In another blow to "perfect substitution," the court was not convinced:

> [T]he Mining Plan EA concluded not that the specific effects of GHG emissions from the expansion would be too uncertain to predict, but that there would in fact be *no* effects from those emissions, because other coal would be burned in its stead. This conclusion is illogical and places the Enforcement Office's thumb on the scale by inflating the benefits of the action while minimizing its impacts.[127]

In an echo of *High Country*, and *SUV CAFE* before it, the court concluded that the "[d]efendants cannot persuasively justify the Enforcement Office's failure to consider the cost of greenhouse gas emissions from coal combustion. The mining plan EA failed to adequately address the indirect and cumulative impacts of the greenhouse gas emissions from the expansion of the Mine."[128]

B. Southeast Market Pipeline Case Remanded for Downstream Emissions

Similarly, in the 2017 D.C. Circuit case *Southeast Market Pipeline*, the court found FERC's EIS was deficient in its omission of the downstream emissions of natural gas sent to Florida power plants via the proposed pipeline.[129] FERC's EIS estimated that one million dekatherms (1.1 billion cubic feet) would pass through the pipeline every day, destined for combustion in Florida power plants, and the court saw no reason why this data was not used to quantify the resulting GHG emissions.[130]

The *Southeast Market Pipeline* case holding made clear that NEPA does not require downstream emissions impacts to be quantified and monetized in all instances.[131] However, because the "project's entire purpose" was to transport gas that would be burned in power plants, the emissions from that burning were reasonably foreseeable, and, "[i]t is just as foreseeable, as FERC does not dispute, that burning natural gas will release into the atmosphere the sorts of carbon compounds that contribute to climate change."[132]

The EIS was remanded to FERC to address quantification of downstream emissions, and to proffer explanation on the absence of an accompanying SCC estimate. The court referenced the explanation offered by FERC in *EarthReports*—that the SCC was essentially too inaccurate and unwieldy for use in NEPA analysis—and on remand requested that FERC explain whether the *EarthReports* rationale still applies and why.[133]

This string of recent cases led one industry analyst to offer this forecast:

> Given the dissent, and the arguable conflict with prior cases, it would not surprise me were the full Circuit to hear the case *en banc*. I certainly expect FERC to seek *en banc* review, and probably to appeal to the Supreme Court, if necessary. If the case stands, one might note the beginning of something of a trend.[134]

On September 27, 2017, FERC answered the remand with a draft supplemental EIS.[135] This supplement calculated the downstream emissions from the combusted natural gas, but "FERC determined that it could not find an appropriate method 'to attribute discrete environmental effects to the potential GHG emissions.'"[136] Further, FERC asserted that *EarthReports* applied vis-à-vis the SCC:

122. Montana Envtl. Info. Ctr. v. U.S. Office of Surface Mining, No. CV 15-106-M-DWM, at *64 (D. Mont. Aug. 14, 2017), http://www.elaw.org/system/files/attachments/publicresource/MEIC_OSM_2017.pdf.
123. *Id.* at *35.
124. *Id.* at *43.
125. *Id.* at *40.
126. *Id.* at **36-38.
127. *Id.* at *46.
128. *Id.* at *47.
129. Sierra Club v. Federal Energy Regulatory Commission, No. 16-1329, 2017 U.S. App. LEXIS 15911, at *24 (D.C. Cir. Aug. 22, 2017).
130. *Id.* at **23-24.
131. *Id.* at *25.
132. *Id.* at *19.
133. *Id.* at *27.
134. Seth Jaffe, *Does NEPA Require Assessment of Downstream GHG Emissions Resulting From Gas Pipelines?*, Law & Env't, Aug. 23, 2017, http://www.lawandenvironment.com/2017/08/23/does-nepa-require-assessment-of-downstream-ghg-emissions-resulting-from-gas-pipelines/.
135. Blank Rome LLP, *FERC Responds Quickly and Decisively to D.C. Circuit Remand in Sabal Trail Matter on Downstream GHG Analysis*, JD Supra, Oct. 3, 2017, http://www.jdsupra.com/legalnews/ferc-responds-quickly-and-decisively-to-40568/.
136. *Id.*

> FERC stuck to its position from *EarthReports* that the SCC is not appropriate for use in a project-level NEPA review and it restated its strong reasoning why. First, in relying on a statement by the EPA concerning the SCC, FERC reasoned that the SCC can have significant variation in output because no consensus exists on an appropriate discount rate to use for an analysis that spans multiple generations. Also, the SCC "does not measure the actual incremental impacts of a project on the environment." Finally, FERC stated that "there are no established criteria [in the SCC] identifying the monetized values that are to be considered significant for NEPA reviews."[137]

In summary, while reporting quantified downstream emissions may be "something of a trend" in NEPA jurisprudence, the compulsory use of the SCC to monetize those emissions is still evolving and uncertain. In the context of the Climate EO, which explicitly applies to regulatory review, will the SCC go the way of *High Country*—a required aspect of an EIS that makes costs and benefits transparent? Or will the SCC go the way of *EarthReports*—an inaccurate and inapplicable protocol that agencies can decline to use at their discretion? The first real test of the court's tolerance for a deleted or diminished SCC may come with litigation on the repeal of the CPP.

IV. The CPP Repeal Draft Floats a "Domestic SCC"

The CPP is a rule created by the Obama EPA that regulates GHG emissions from stationary sources (e.g., coal-fired power plants). The CPP was almost immediately targeted for repeal by the Trump Administration. The RIA of the repeal reengineers the SCC to demonstrate the cost savings of the repeal.

A. *What Is the CPP Repeal?*

The CPP was the centerpiece of the Obama Administration's GHG reduction commitments pursuant to the Paris Agreement. The rule was finalized in October 2015.[138] Section 4 of the Climate EO directed EPA to "as soon as practicable, suspend, revise, or rescind the guidance, or publish for notice and comment proposed rules suspending, revising, or rescinding those [CPP] rules."[139] On October 16, 2017, EPA published a notice of the proposed rule to repeal the CPP.[140] The rationale given was that EPA:

> proposes a change in the legal interpretation as applied to section 111(d) of the Clean Air Act, on which the CPP was based, to an interpretation that is consistent with the Act's text, context, structure, purpose, and legislative history, as well as with EPA's historical understanding and exercise of its statutory authority. EPA will accept comment on the proposal until April 26, 2018.[141]

As of March 9, 2018, more than 500,000 comments had been submitted.[142]

B. *The Climate EO and the CPP Repeal*

The first real demonstration of how the Trump Climate EO will become operative in the regulatory context was revealed in the October 2017 release of the proposed RIA for the repeal of the CPP.[143] The CPP is a revised set of guidelines for stationary sources of GHG emissions (power plants that combust fossil fuels) that was promulgated by the Obama Administration's EPA, under the authority of the Clean Air Act (CAA).[144] In the CPP litigation, EPA was attacked under CAA §111(d) for allegedly exceeding the scope of that statute, because the SCC modeling takes global ramifications of GHG reductions into account.[145]

In response, the Climate EO echoes these critiques, saying that agencies should use Circular A-4 "when monetizing the value of changes in GHG emissions resulting from regulations, including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates."[146] This seems to suggest that agencies should make the price point lower. Section 4 of the Climate EO expressly proscribes an interagency review of the CPP, and directs EPA Administrator Scott Pruitt to "determine whether to revise or withdraw"[147] the CPP, in alignment with the order's policy directive that environmental regulations "are of greater benefit than cost."[148]

If the cost of GHG emissions, and thereby the benefits of carbon reductions, cannot be monetized in such a way so as to justify the short-term costs of regulation, then the entire calculus changes and those regulations will be removed. Hence, in response to §4 of the Climate EO regarding the CPP, and §5 regarding the withdrawal

137. *Id.*
138. Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64661 (Oct. 23, 2015), *available at* https://www.federalregister.gov/documents/2015/10/23/2015-22842/carbon-pollution-emission-guidelines-for-existing-stationary-sources-electric-utility-generating.
139. Climate EO, *supra* note 5, §4.
140. Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48035 (Oct. 16, 2017), *available at* https://www.gpo.gov/fdsys/pkg/FR-2017-10-16/pdf/2017-22349.pdf.
141. *Id.*
142. Repeal of Carbon Dioxide Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (No. EPA-HQ-OAR-2017-0355), https://www.regulations.gov/docket?D=EPA-HQ-OAR-2017-0355.
143. Office of Air Quality Planning and Standards, U.S. EPA, Regulatory Impact Analysis for the Review of the Clean Power Plan: Proposal (2017) [hereinafter CPP RIA], https://www.epa.gov/sites/production/files/2017-10/documents/ria_proposed-cpp-repeal_2017-10.pdf.
144. 40 C.F.R. pts. 60, 70, 71 et seq., Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units; Final Rule, 80 Fed. Reg. 64509 (Oct. 23, 2015) [hereinafter CPP], *available at* https://www.federalregister.gov/documents/2015/10/23/2015-22837/standards-of-performance-for-greenhouse-gas-emissions-from-new-modified-and-reconstructed-stationary.
145. Stacey L. Van Bellegham & Kipp A. Coddington, *Implications of the Evolving NEPA Framework for Assessing Greenhouse Gas Emissions and the Social Cost of Carbon*, 62 Rocky Mtn. Min. L. Inst. 6 (2016).
146. *Id.* at 3.
147. Climate EO, *supra* note 5, §4.
148. *Id.* §1(e).

of the SCC as "no longer representative of governmental policy,"[149] EPA's monetization of the carbon in the proposed RIA of the CPP repeal is dramatically lower than previous estimates—as low as $1/ton.[150]

C. *"MAGA Math": $0.01 to $1.00/ton CO_2*

In line with the theme of "America First" and the legal attack that GHG regulation on the CPP exceeds EPA's authority under the CAA,[151] the proposed CPP repeal RIA applies a "domestic social cost of CO_2" to monetize the benefits of carbon reduction regulations.[152] As per the directives of Circular A-4,[153] the RIA uses 3% and 7% discount rates, to arrive at an SCC of $7 and $1, respectively.[154] This is a dramatic change from the Obama-era IWGSCC ($37/ton CO_2),[155] and the $42/ton CO_2 figure recommended by the National Academies of Sciences earlier in 2017.[156]

Relatedly, while the CPP did not go as far as to monetize climate benefits of the rule,[157] the CPP repeal RIA does forecast the cost of forgone climate benefits in 2020 (for example) at a 3% discount rate as *one cent*, and at a 7% discount rate, at *zero cents*.[158] This calculation again raises the issue of the social cost of climate change being presented as zero. The legal challenge to this logic would echo the query by Judge Hawkins regarding the CAFE standards back in 2008: "Let's go to the chase, what's the justification for assigning zero value to CO_2 reduction?"[159]

The 97% decrease in an SCC, and the less-than-zero monetization of GHG reduction benefits, raises legal questions about the arbitrary nature of such calculations: Is such a drastic price drop only due to "domesticating" climate change impacts? Can an agency credibly "domesticate" a global phenomenon? And while proponents argue that the domestic SCC figure is more in line with the domestic statutory authority of the CAA, the forces driving the costs of climate change are in fact global in nature. Superstorms that develop offshore, global migration flows from submerged cities, disrupted commodities markets—these impacts are ineluctably unfolding internationally, with direct and indirect costs to the United States.

While the CPP is currently stayed due to litigation,[160] this repeal will undoubtedly also trigger substantial litigation—and the monetization of carbon emissions and GHG reductions will likely be part of the controversy. One legal inquiry will be the arbitrary and capricious nature of the finding of such low carbon costs in the RIA, and presumably the subsequent repeal action. For SCC supporters who want to see the CPP and other GHG-reducing rules implemented, the APA arguments will be that the models were manipulated to arrive at a cost of one cent or one dollar, because that serves the political agenda of repeal, and has no basis in the complex modeling used to develop the SCC—or the reality of an inherently global phenomenon—and is arbitrary considering the National Academies of Sciences' estimate just months earlier of $42/ton CO_2.

In contrast, the Trump EPA and other backers of repeal will point to the appendix of the RIA that describes over many pages the treatment of uncertainty in estimating the SCC and the methodology for creating a "domestic SCC," which they characterize as commensurate with the purely domestic scope of the CAA's statutory authority.[161]

As a major federal action, the repeal is also, of course, subject to NEPA. While this RIA and related legal arguments about monetizing carbon may inform NEPA jurisprudence moving forward, the CPP is entirely regulatory, and is therefore administrative and entitled to a high degree of deference. The question of statutory duties to use the SCC under NEPA remains open.

V. Moving Forward: Trump Cannot Zero Out the SCC

As Bloomberg columnist and former Obama OMB chief Cass Sunstein argued after the CPP RIA release:

> [I]f the EPA is going to alter its position, to ignore harm to those outside our country, and to treat the social cost of carbon as close to zero, it owes the American people, and the world, some kind of explanation. In a nation that is committed to giving reasons for its actions, rather than exercising naked political will, it is required—by sound policy and also by law—to produce some substantive justification for its shift.[162]

Thus far, no substantive justification has been offered. The inevitable challenge to the one dollar/one cent math of the RIA for the CPP repeal (in the regulatory context) will inform courts' treatment of the SCC question under NEPA. While the Trump Administration has clearly rejected climate change-related regulations, NEPA juris-

149. *Id.* §5(b).
150. CPP RIA, *supra* note 143, at 166.
151. Press Release, U.S. EPA, EPA Takes Another Step to Advance President Trump's America First Strategy, Proposes Repeal of "Clean Power Plan" (Oct. 10, 2017), https://www.epa.gov/newsreleases/epa-takes-another-step-advance-president-trumps-america-first-strategy-proposes-repeal.
152. CPP RIA, *supra* note 143, at 162 app. C.
153. Circular A-4, *supra* note 50.
154. CPP RIA, *supra* note 143, at 166.
155. Goldstein, *supra* note 32.
156. National Academies of Sciences, Engineering, and Medicine, *supra* note 26.
157. CPP, *supra* note 143, at 6462:
> We are not projecting direct monetized climate benefits in terms of CO_2 emission reductions associated with these standards of performance. This is because, as stated above, the EPA believes that electric power companies will choose to build new [electric generating units] that comply with the regulatory requirements of this rule even in its absence, primarily [natural gas combined-cycle] units, because of existing and expected market conditions.
158. CPP RIA, *supra* note 143, at 20 tbl. 1-11.
159. Transcript of Oral Argument, Center for Biological Diversity v. National Highway Traffic Safety Admin., 538 F.3d 1172, 1199, 38 ELR 20214 (9th Cir. 2008) (No. 06-71891).
160. Juan Carlos Rodriguez, *DC Circ. Pauses CPP Litigation for 2 More Months*, Law360, Aug. 8, 2017, https://www.law360.com/articles/952545/dc-circ-pauses-cpp-litigation-for-2-more-months.
161. CPP RIA, *supra* note 143, at 162.
162. Cass R. Sunstein, *The EPA Owes Us a Reason for Killing Clean Power Plan*, Bloomberg, Oct. 12, 2017, https://www.bloomberg.com/view/articles/2017-10-12/the-epa-owes-us-a-reason-for-killing-clean-power-plan.

prudence has been moving along another trend line that is clearly pointing to a more robust accounting of GHG impacts, not a lesser one. As discussed above, downstream emissions quantification and monetization have been requested by courts remanding for NEPA compliance on three occasions in late 2017.[163]

High Country was a unique, "smoking gun" fact pattern, in that the SCC was in the draft EIS and then arbitrarily deleted from the final EIS, seemingly in response to an internal e-mail.[164] However, that holding has now been cited by several courts in the context of more expansive fact patterns, and *High Country* and its progeny may inform how some courts could interpret the clash of the NEPA precedent that requires the SCC with the Trump Climate EO, that eliminates its use. For example, if there is a draft EIS out there that used the SCC, and a final draft that was changed to delete it, that would be a "smoking gun" fact pattern akin to *High Country*.

Similarly, if a draft EIS used a number derived from the SCC (e.g., the $42/metric ton CO_2 recommended by the January 2017 report of the National Academies of Sciences),[165] and then changed the number to something lower in a final EIS, without "cross-referenc[ing] the data or studies on which [an agency] base[d] the benefit and cost estimates" as required by Circular A-4,[166] that could also give rise to NEPA litigation. However, even in a broader fact pattern akin to *Montana Environmental Information Center*'s coal mine expansion plan, courts will likely be requiring monetization for GHG emissions because the precedent and the emerging conventional wisdom is clear that the cost of these emissions is more than $0.

One of the Trump Administration's primary legal attacks on the SCC in the CPP and related regulations turns on its interpretation that the CAA's scope only grants authority to regulate within the United States, and, therefore, an analysis of a global phenomenon like climate change has no place in U.S. regulations. While CO_2 emissions are somewhat different from other toxic pollutants, this domestic rationale for the CAA does not even add up in the context of air pollution generally. As a recent study explains, "[M]an-made emissions in Asia is the 'major driver' of the rise in ozone levels in the western U.S. for both spring and summer in recent decades. The researchers cited data that ranges from Joshua Tree National Park in southern California, to observations in Denver, Colorado, and the eastern U.S."[167] The implication of this study is obvious: smog crosses oceans and emissions from elsewhere pollute the air within our borders; to keep our air healthy, regulators must take that into account. This general concept of transboundary air pollution goes back at least to the Chernobyl disaster of 1986, when radioactive clouds drifted across Europe, Asia, and the Arctic.[168]

Relatedly, the CAA provisions that regulate ozone-degrading materials, such as the chlorofluorocarbons (CFCs) used in refrigerators, have contributed to the shrinkage of the ozone hole that is outside of U.S. borders, over Antarctica[169]—and have also helped to prevent untold numbers of Americans from contracting skin cancer.[170] Indeed, the U.S. CFC regulations under the CAA are in accordance with the global effort of the Montreal Protocol—which has universal United Nations ratification—and has enabled the successful recovery of the Antarctic ozone hole.[171] It is the CAA that has provided the statutory authority for the domestic regulation of CFCs and related ozone-depleting pollutants, which has contributed to this global benefit with domestic cost savings.[172] In the case of ozone, the CAA regulates domestic emissions of CFCs as part of a global framework to remedy a global problem. Is this not a sound precedent for modeling regulation of GHG emissions reductions domestically, in harmony with global efforts like the Paris Agreement?

As the preamble to the Paris Agreement explains, "[C]limate change is a common concern of humankind."[173] The earth itself is a web of dynamic, interdependent systems—winds blow pollution from Asia to the U.S. East Coast, superstorms form in the warm oceans of the South Atlantic and pummel the U.S. Gulf Coast, wildfires begin in Canada and burn across the border, and emissions of GHGs anywhere will eventually have an economic impact everywhere. Considering the GAO report that the federal government has already spent $350 billion on climate change disaster-related costs over the past 10 years, before an accounting of impact from the massive trio of Hurricanes Harvey, Irma, and Maria, or the vast western wildfires of 2017,[174] the effort by the Trump EPA to "domesticate" climate's social costs to pennies on the dollar appears legally suspect.

163. Jaffe, *supra* note 134.
164. High Country Conservation Advocates v. U.S. Forest Serv., 52 F. Supp. 3d 1174, 1189, 44 ELR 20144 (D. Colo. 2014).
165. National Academies of Sciences, Engineering, and Medicine, *supra* note 26, at 2-3.
166. Circular A-4, *supra* note 50, at 12.
167. Bill Chappell, *Smog in Western U.S. Starts Out as Pollution in Asia, Researchers Say*, NPR News, Mar. 3, 2017, https://www.npr.org/sections/thetwo-way/2017/03/03/518323094/rise-in-smog-in-western-u-s-is-blamed-on-asias-air-pollution; *see also* Meiyun Lin et al., *US Surface Ozone Trends and Extremes From 1980 to 2014: Quantifying the Roles of Rising Asian Emissions, Domestic Controls, Wildfires, and Climate*, 17 Atmospheric Chemistry & Physics 2943-70 (2017), *available at* https://www.atmos-chem-phys.net/17/2943/2017/.
168. *See*, *e.g.*, BBC News, *The Chernobyl Disaster* (showing maps of the radioactive plumes that emanated from Ukraine across the hemisphere), http://news.bbc.co.uk/2/shared/spl/hi/guides/456900/456957/html/nn3page1.stm (last visited Apr. 5, 2018).
169. Jayanarayanan Kuttippurath & Prijitha J. Nair, *The Signs of Antarctic Ozone Hole Recovery*, 7 Sci. Rep. art. 585 (2017) ("Our results demonstrate that the Montreal Protocol has indeed begun to save the Antarctic ozone layer"), https://www.nature.com/articles/s41598-017-00722-7.
170. Skin Cancer Foundation, *Ozone and UV: Where Are We Now?,* http://www.skincancer.org/prevention/uva-and-uvb/ozone (last updated July 27, 2009).
171. U.S. EPA, *International Actions—The Montreal Protocol on Substances That Deplete the Ozone Layer*, https://www.epa.gov/ozone-layer-protection/international-actions-montreal-protocol-substances-deplete-ozone-layer (last updated Feb. 16, 2018).
172. U.S. EPA, *Ozone Protection Under Title VI of the Clean Air Act*, https://www.epa.gov/ozone-layer-protection/ozone-protection-under-title-vi-clean-air-act (last updated June 5, 2017).
173. *Paris Agreement*, U.N. Framework Convention on Climate Change (2015), http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.
174. U.S. GAO, *supra* note 1.

In this epoch of the Anthropocene, the purpose of NEPA remains relevant and crucial. As the public interest attorneys of Earthjustice explain, "[I]ts mandate is simple. It ensures the federal government informs and engages the public it serves."[175] Therefore, a robust accounting of both downstream emissions and their monetized costs using the SCC is essential—without revealing these impacts, the public and policymakers cannot know the true consequences of continued fossil fuel expansion. To satisfy the legislative intent of NEPA, the costs of GHG emissions must be fully disclosed. The Trump Climate EO §5 is in direct conflict with the statutory scope of NEPA.

Because the Climate EO requires that economic benefits outweigh costs in all environmental regulatory actions, and ends the use of the SCC by U.S. government agencies, natural gas industry defense lawyers concluded that "it [will be] very challenging to demonstrate a net benefit in a cost-benefit analysis for GHG regulations . . . it may be difficult, if not impossible, to finalize any new regulations of GHG emissions."[176]

Indeed, any new federal climate-protecting policy is effectively dead under President Trump. For now, NEPA litigation using the SCC could offer environmental interests one way to slow down, or perhaps even halt, the rush of fossil fuel projects authorized by the Climate EO. As Professor Farber explains, "When he rescinded the Obama Administration's estimate of the social cost of carbon, Trump may have thought he was settling something. Instead, he was only opening the doors to a whole new set of problems."[177] Regardless of how agencies proceed, it appears that one thing is certain: continued litigation on the SCC.

175. *We Will Not Be Silenced. Stand Up for a Strong NEPA!*, Earthjustice, Mar. 13, 2017, https://earthjustice.org/features/nepa.

176. Jordan Rodriguez, *President Trump's Executive Order Withdraws the Social Cost of Carbon*, Fracking Insider, Apr. 13, 2017, http://www.frackinginsider.com/regulatory/president-trumps-executive-order-withdraws-social-cost-carbon/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+HydraulicFracturingInsider+%28Hydraulic+Fracturing+Insider%29.

177. Farber, *supra* note 17.