

# EFFICIENCY GATEKEEPERS, THE SOCIAL COST OF CARBON, AND POST-TRUMP CLIMATE CHANGE REGULATION

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## ABSTRACT

*In a series of headline-grabbing and controversial moves, the Trump administration reversed national climate change policy. Most visibly, President Trump withdrew from the Paris Climate Agreement, directed the Environmental Protection Agency (EPA) to revise or revoke greenhouse gas standards promulgated under President Obama, and appointed EPA Administrators demonstrably hostile to climate change science.*

*But a less publicized battle stands to shape U.S. climate change law from behind the scenes both during and after his presidency. President Trump's March 2017 executive order directing the EPA to revisit greenhouse gas regulations also jettisoned the federal social cost of carbon (SCC), a set of standardized values developed during the Obama administration to monetize the climate benefits of new regulations. The move pleased congressional conservatives who had repeatedly sought to block agencies' inclusion of the figures in cost-benefit analyses (CBAs) of proposed rules. Disputes over the methodology and role of such specialized calculations unsurprisingly evade widespread public discussion. However, the rise of executive-enforced cost-benefit analysis has made such seemingly obscure technical questions key determinants of U.S. policy.*

*A series of executive orders since the Reagan administration have made the Office of Information and Regulatory Affairs (OIRA) an efficiency gatekeeper, enforcing a formal process of cost-benefit analysis for new regulations. Because federal agencies' CBAs often overlook unmonetized benefits, development of the federal SCC advanced climate change policy compared to prior practice. The federal SCC made visible the value of reducing carbon dioxide emissions, allowing this benefit to counterbalance costs in agencies' regulatory impact analyses. Nonetheless, this Article argues that the federal SCC undermines effective policy in the long run. While scholars have questioned the federal SCC's methodology, this Article raises concerns about the broader analytical paradigm of which it is a part.*

*CBA under OIRA oversight impedes critical reform of energy, transportation, and other systems because its antiregulatory process favors the*

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*status quo. It presumes a neutral, unregulated baseline. The formality of the analysis also obscures impacts that cannot be monetized. Meanwhile, the analysis overlooks policies that have distorted markets and infrastructure by subsidizing fossil fuel development. To the extent the federal SCC implies that formal CBA optimizes decisionmaking, it also stands to mislead policymakers; to make the necessary calculations, analysts must forecast social, economic, and technological conditions far into a future that will lack familiar environmental stability. The difficulty of imagining these background conditions makes these predictions extremely rough at best. Finally, the end product of CBA—numeric models of decision options—implies a level of understanding and control over the physical environment that humans do not in fact possess. With climate change, the failure to comprehend limits of human understanding contributes to complacency in the face of potential disaster.*

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## INTRODUCTION

The Trump administration reversed course on national climate change policy through a series of headline-grabbing actions. Most visibly, President Trump initiated the United States' withdrawal from the Paris Climate Accord,<sup>1</sup> appointed Environmental Protection Agency (EPA) Administrators with demonstrable hostility to climate change science,<sup>2</sup> and issued an executive order directing the EPA to revise or suspend greenhouse gas regulations promulgated under President Obama.<sup>3</sup>

Although these direct assaults on existing policy were highly visible, a much less publicized battle stands to reshape U.S. climate change law from behind the scenes. The same March 2017 executive order that directed the EPA to reconsider existing greenhouse gas regulations also jettisoned the federal social cost of carbon (SCC),<sup>4</sup> a set of standardized values developed during the Obama administration to monetize the climate change benefits of proposed regulations.<sup>5</sup> Because agencies must justify major regulations through a largely monetized cost-benefit analysis (CBA), the resulting calculations play a critical role in determining both the stringency and viability of regulatory standards.<sup>6</sup> President Trump's order withdrew all documents relating to the federal SCC, including background technical documents detailing the economic costs of global warming.<sup>7</sup> Although President Trump's order did not prohibit agencies from attempting to calculate climate benefits, it required any subsequent analyses to follow strictly a 2003 Office of Management and Budget (OMB) guidance

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1. See President Donald Trump, Statement on the Paris Climate Accord (June 1, 2017) (transcript available at <http://www.whitehouse.gov/briefings-statements/statement-president-trump-paris-climate-accord/> [<http://perma.cc/8S3K-BEFM>]).

2. See Doina Chiacu & Valerie Volcovici, *EPA Chief Pruitt Refuses To Link CO<sub>2</sub> and Global Warming*, SCI. AM., <http://www.scientificamerican.com/article/epa-chief-pruitt-refuses-to-link-co2-and-global-warming/> [<http://perma.cc/E5XK-YYVF>] (last visited Feb. 15, 2019). After Scott Pruitt resigned, President Trump replaced him with Andrew Wheeler, a lobbyist for the fossil fuel industry. See Chase Peterson-Withorn, *Scott Pruitt's Replacement Has Earned More than \$700,000 as a Fossil Fuel-Industry Lobbyist*, FORBES (July 5, 2018, 8:42 PM), <http://www.forbes.com/sites/chasewithorn/2018/07/05/scott-pruitts-replacement-has-earned-more-than-700000-as-a-fossil-fuel-industry-lobbyist/#4f0ed48134ca> [<http://perma.cc/7PWE-KVEF>].

3. Exec. Order No. 13,783 § 3, 82 Fed. Reg. 16,093, 16,094 (Mar. 28, 2017).

4. This Article uses the term *federal SCC* to describe the set of values created during the Obama administration. Because several researchers and other parties have used other methods to propose their own set of values to represent a social cost of carbon, this Article represents the broader, nonspecific group of proposals with the fully written out words, *social cost of carbon*.

5. See INTERAGENCY WORKING GRP. ON SOC. COST OF CARBON, RESPONSE TO COMMENTS: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866, at 3 (2015) [hereinafter IWG, RESPONSE TO COMMENTS]. The Interagency Working Group, convened by the Office of Management and Budget, developed the federal SCC to "monetize the net effects (comprising both positive and negative effects) of CO<sub>2</sub> emissions." *Id.* This standard calculation aimed to "promote consistency in the way agencies quantify the benefits of reducing CO<sub>2</sub> emissions, or costs from increasing emissions." *Id.*

6. *Id.* at 3–5.

7. Exec. Order No. 13,783, § 5(b), 82 Fed. Reg. at 16,095–96.

document, Circular A-4,<sup>8</sup> that directs agencies to discount steeply the value of preventing future harms and to focus on impacts within the United States.<sup>9</sup> Indeed, President Trump's EPA applied these limitations to assess the costs and benefits of repealing the Obama administration's Clean Power Plan and to support replacing it with much less effective power plant efficiency improvement guidelines.<sup>10</sup> Disputes over the methodology and relevance of such specialized calculations unsurprisingly evade widespread public discussion. However, the rise of executive branch CBA has made these seemingly obscure technical questions key determinants of federal policy.

Political dynamics and legal trends have placed administrative agencies in the foreground of climate change policymaking. The majority of federal environmental law's foundational statutes originated during the 1960s and 1970s in a period of ambitious reform driven by Congress and supported by the courts.<sup>11</sup> In contrast, the current era has been marked by legislative stagnation.<sup>12</sup> Efforts to enact a federal cap-and-trade program to reduce greenhouse gases (GHGs) were among the casualties of congressional dysfunction during this latter period.<sup>13</sup> Given congressional stasis, federal efforts to regulate GHG emissions fell to administrative agencies, particularly the EPA.<sup>14</sup> Federal

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8. OFFICE OF MGMT. & BUDGET, CIRCULAR A-4 (2003) [hereinafter OFFICE OF MGMT. & BUDGET, CIRCULAR A-4].

9. See *id.* at 15 (directing federal agencies to “focus” their CBA “on benefits and costs that accrue to citizens and residents of the United States” and to report effects occurring outside of the United States “separately”); *id.* at 31–34 (indicating a preference for current benefits over postponed benefits and directing agencies to provide estimates of net benefits using both 3% and 7% discount rates).

10. See EPA, REGULATORY IMPACT ANALYSIS FOR THE PROPOSED EMISSION GUIDELINES FOR GREENHOUSE GAS EMISSIONS FROM EXISTING ELECTRIC UTILITY GENERATING UNITS; REVISIONS TO EMISSION GUIDELINE IMPLEMENTING REGULATIONS; REVISIONS TO NEW SOURCE REVIEW PROGRAM 1-3 to 1-4 (2018).

11. See Richard J. Lazarus, *Environmental Law at the Crossroads: Looking Back 25, Looking Forward 25*, 2 MICH. J. ENVTL. & ADMIN. L. 267, 268, 273–78 (2013).

12. See *id.* at 278–84 (describing this transition from the ambitious legislation of the 1960s and 1970s to the current period of stagnation in Congress).

13. See Jonathan Zasloff, *Courts in the Age of Dysfunction*, 121 YALE L.J. ONLINE 479, 491 (2012) (describing contemporary congressional dysfunction). Although the 111th Congress saw the introduction of numerous bills to establish a cap-and-trade system to reduce GHG emissions, see *Congress Climate History*, CTR. FOR CLIMATE & ENERGY SOLUTIONS, <http://www.c2es.org/content/congress-climate-history/> [<http://perma.cc/PG8Z-TZQE>] (last visited Feb. 15, 2019) (listing legislation introduced between 2008 and 2010), the closest Congress has come to finalizing legislation was when the House of Representatives passed the American Clean Energy and Security Act of 2009 (ACES), H.R. 2454, 111th Cong. (2009), a bill that subsequently died in the Senate, see *H.R. 2454 (111th): American Clean Energy and Security Act of 2009*, GOVTRACK.US, <http://www.govtrack.us/congress/bills/111/hr2454> [<http://perma.cc/YUA3-CY3Z>] (last visited Feb. 15, 2019) (giving the bill's history). ACES would have established a national cap-and-trade program and included additional programs to address climate change, such as expanded energy efficiency in buildings, incentives for research into carbon capture and sequestration, and green job programs, among other things. See H.R. 2454, §§ 114, 201–209, 421–424A.

14. See *Massachusetts v. EPA*, 549 U.S. 497, 528 (2007) (finding that the Clean Air Act authorizes the EPA to regulate GHGs because these emissions fall within the Act's definition of “pollutants”); see also *Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410, 423 (2011) (describing how

agencies' role as first movers makes the rules of administrative law and process critical determinants of U.S. climate policy.

CBA under executive control has substantially reshaped administrative lawmaking over the last few decades.<sup>15</sup> The wave of federal environmental legislative activity during the late 1960s and 1970s—including passage of the Clean Air Act and other federal statutes—occurred before law and economics had taken center stage as the favored paradigm for risk regulation.<sup>16</sup> Consequently, most environmental statutes do not mandate formalized CBA, and indeed they often can be read to preclude its use.<sup>17</sup> Nonetheless, executive orders since the Reagan administration have required federal agencies to justify major new environmental and safety standards by demonstrating a favorable benefit-to-cost ratio.<sup>18</sup> In addition, these orders have directed agencies to set regulatory stringency at levels that maximize net benefits and impose the least costs.<sup>19</sup> Executive orders have subjected federal agencies' major rulemakings to review by the Office of Information and Regulatory Affairs (OIRA), a department within the OMB, to ensure that agencies perform CBA and comport with other efficiency-oriented policies.<sup>20</sup> Although highly controversial among academics,<sup>21</sup> OIRA oversight and the regulatory impact of formalized CBA have gone under the radar in broader public discussion.<sup>22</sup>

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the EPA's authority to regulate GHGs under the Clean Air Act displaces federal public nuisance causes of action for climate change impacts).

15. See *infra* Section II for a discussion of the executive branch's focus on formal CBA and the limiting effects this has had on regulatory agencies' ability to respond to climate change.

16. See William Boyd, *Genealogies of Risk: Searching for Safety, 1930s–1970s*, 39 *ECOLOGY L.Q.* 895, 956–62, 978–81 (2012) (describing a shift from safety and precaution to “acceptable risk” and the eventual triumph of economic analysis).

17. See Daniel A. Farber, *Rethinking the Role of Cost-Benefit Analysis*, 76 *U. CHI. L. REV.* 1355, 1373–79 (2009) [hereinafter Farber, *Rethinking*] (describing the regulatory standards in the Clean Air Act and other environmental statutes, noting the absence of cost-benefit prescriptions, and arguing that “even if the statutory language were open to this interpretation, it would clearly be unreasonable to view all of these statutory standards as allowing CBA since that would collapse into one the multifarious standards that Congress so carefully distinguished” and “that relatively few environmental statutes allow the kind of open-ended balancing that CBA provides”).

18. See *infra* Section II for a discussion of federal agencies' CBAs.

19. See *infra* Part II.A for a discussion of federal agencies' CBAs under Circular A-4.

20. See *infra* Section II for a discussion of this trend.

21. For criticisms, see, for example, FRANK ACKERMAN & LISA HEINZERLING, *PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING* 1–12, 195–209 (2004); DOUGLAS A. KYSAR, *REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY* 11–22 (2010) [hereinafter KYSAR, *REGULATING FROM NOWHERE*]; SIDNEY A. SHAPIRO & ROBERT L. GLICKSMAN, *RISK REGULATION AT RISK: RESTORING A PRAGMATIC APPROACH* 73–91 (2003); David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 24 *ECOLOGY L.Q.* 545, 568, 573–74 (1997) [hereinafter Driesen, *The Societal Cost*]; Gregory C. Keating, *Is Cost-Benefit Analysis The Only Game in Town?*, 91 *S. CAL. L. REV.* 195, 199–200 (2018); Gregory N. Mandel & James Thuo Gathii, *Cost-Benefit Analysis Versus the Precautionary Principle: Beyond Cass Sunstein's Laws of Fear*, 2006 *U. ILL. L. REV.* 1037, 1044 (“[C]onsiderable literature . . . demonstrates that substantial challenges regarding (a) uncertainty, (b) valuation, and (c) temporal concerns render even rough application of cost-benefit analysis often impossible.”); Thomas O. McGarity, *A Cost-Benefit State*, 50 *ADMIN. L. REV.* 7, 42–49 (1998) [hereinafter McGarity, *A Cost-Benefit State*]. For generally favorable accounts, see, for example, CASS

CBA and corresponding law and economics theories have increasingly shaped the culture of risk regulation in the United States (in contrast with other countries' more precautionary approaches).<sup>23</sup> Some scholars have urged Congress to incorporate CBA into more legislation and have called on judges to read it into ambiguous legislative mandates.<sup>24</sup> Harvard Professor Cass Sunstein, former head of OIRA and influential CBA proponent, applauded a recent Supreme Court decision for completing the government's transition to the "cost-benefit state."<sup>25</sup> Sunstein's gratitude should not be surprising given that his 2002 book, *The Cost Benefit State: The Future of Regulatory Protection*, argued for judicially imposed CBA.<sup>26</sup> As head of OIRA during the Obama administration,

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R. SUNSTEIN, *THE COST-BENEFIT STATE: THE FUTURE OF REGULATORY PROTECTION* 19–20 (2002) [hereinafter SUNSTEIN, *COST-BENEFIT STATE*]; CASS R. SUNSTEIN, *RISK AND REASON: SAFETY, LAW, AND THE ENVIRONMENT* 99 (2002) [hereinafter SUNSTEIN, *RISK AND REASON*]; Steve P. Calandrillo, *Responsible Regulation: A Sensible Cost-Benefit, Risk Versus Risk Approach to Federal Health and Safety Regulation*, 81 B.U. L. REV. 957, 959 (2001) (arguing that CBA is inherent in personal decisions and that tradeoffs are unavoidable); Robert W. Hahn, *The Economic Analysis of Regulation: A Response to the Critics*, 71 U. CHI. L. REV. 1021, 1049–50 (2004).

22. See Leif Fredrickson, *The Federal Agency That Few Americans Have Heard of and Which We All Need To Know*, WASH. POST (Sept. 28, 2017), <http://www.washingtonpost.com/news/made-by-history/wp/2017/09/28/the-federal-agency-that-few-americans-have-heard-of-and-which-we-all-need-to-know/> [http://perma.cc/Y67N-DQ3L] (describing OIRA as an agency "foreign to most Americans" and yet wielding power that makes it "one of the most powerful bureaucracies inside the Beltway"); Ctr. for Regulatory Effectiveness in Legislation, *OIRA: The Most Important Government Office You've Never Heard Of*, INDEP. VOTER NETWORK, (Jan. 29, 2016), <http://ivn.us/2016/01/29/oira-important-government-office-youve-never-heard/> [http://perma.cc/GJ4A-DVCY].

23. See Douglas A. Kysar, *It Might Have Been: Risk, Precaution and Opportunity Costs*, 22 J. LAND USE & ENVTL. L. 1, 2–3 (2006) (distinguishing U.S. and European policymakers' general approaches to risk regulation and attributing the less cautious U.S. policy to the cost-benefit paradigm).

24. See, e.g., SUNSTEIN, *COST-BENEFIT STATE*, *supra* note 21, at 133–36 (proposing amendments to the Clean Air Act to incorporate cost into standard setting); Jonathan S. Masur & Eric A. Posner, *Cost-Benefit Analysis and the Judicial Role*, 85 U. CHI. L. REV. 935, 980–81 (2018) (condoning the apparent convergence of "three branches of government . . . on the view that regulatory agencies should normally comply with CBA" and stating that "regulatory agencies should use CBA, and courts are capable of forcing them to"); Cass R. Sunstein, *A Regulatory Reform Bill That Everyone Should Like*, BLOOMBERG OPINION (June 22, 2017, 8:30 AM), <http://www.bloomberg.com/opinion/articles/2017-06-22/a-regulatory-reform-bill-that-everyone-should-like> [http://perma.cc/BJC4-8ea8] (expressing general support for the Regulatory Accountability Act of 2017, a proposed bill that would have amended the Administrative Procedures Act (APA) to legislatively mandate formal CBA under OIRA); see also H.R. 5, 115th Cong. (2017) ("The Regulatory Accountability Act") (amending the APA to prohibit agencies from adopting major final rules without performing CBA and consulting with OIRA and directing OIRA to issue guidelines for agency CBA); John D. Graham & Paul R. Noe, Opinion, *A Reply to Professor Amy Sinden's Critique of the "Cost-Benefit State"*, REGULATORY REV. (Sept. 27, 2016), <http://www.theregreview.org/2016/09/27/graham-noe-reply-critique-cost-benefit-state/> [http://perma.cc/4NFA-3F2A] ("We stand by our view that Congress and the next President should enhance societal well-being by supporting and strengthening the bipartisan tradition of using cost-benefit analysis for important regulatory decisions.").

25. Cass R. Sunstein, *Thanks, Justice Scalia, for the Cost-Benefit State*, BLOOMBERG OPINION (July 7, 2015, 9:00 AM), <http://www.bloomberg.com/view/articles/2015-07-07/thanks-justice-scalia-for-the-cost-benefit-state> [http://perma.cc/Y752-8VPP] (commenting on the Supreme Court's decision in *Michigan v. EPA*, 135 S. Ct. 2699 (2015)).

26. See SUNSTEIN, *COST-BENEFIT STATE*, *supra* note 21, at 123–28.

Sunstein oversaw the interagency effort to synthesize research on economics and climate change for development of the federal SCC.<sup>27</sup>

The federal SCC received unceremonious judicial endorsement in an August 2016 decision, *Zero Zone, Inc. v. United States Department of Energy*,<sup>28</sup> wherein the Seventh Circuit upheld the Department of Energy's use of the federal SCC to set energy efficiency standards for commercial refrigerators.<sup>29</sup> The decision's short and matter-of-fact discussion affirmed the Department's approach under established principles of deference to agency technical expertise.<sup>30</sup> Despite the seemingly straightforward nature of the issue, the case stepped into a heated battle over climate change policy, economic theories of administration, and presidential power to act as gatekeeper between existing statutes and agency implementation.<sup>31</sup> Just a month before the ruling, Congress saw another in a series of Republican-proposed bills targeting the federal SCC for elimination, part of a broader multiyear effort to prevent agencies from regulating GHG emissions.<sup>32</sup> Given these attacks, several commentators viewed the decision as a major environmental win.<sup>33</sup>

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27. See Cass R. Sunstein, *The Real World of Cost-Benefit Analysis: Thirty-Six Questions (And Almost as Many Answers)*, 114 COLUM. L. REV. 167, 170–173 (2014) [hereinafter Sunstein, *Real World*].

28. 832 F.3d 654 (7th Cir. 2016).

29. *Zero Zone*, 832 F.3d at 676–79.

30. *Id.*

31. *Id.* at 667, 678–89.

32. See H.R. 5668, 114th Cong. (2016) (“To prohibit the Secretary of Energy and the Administrator of the Environmental Protection Agency from taking the social cost of carbon or the social cost of methane into account when taking any action, and for other purposes.”); see also, e.g., Amendments to the Energy and Water Development Related Agencies Appropriations Act of 2017, H.R. 5055, 114th Cong. (2016) (prohibiting the use of funds to prepare, propose, or promulgate any regulation or guidance related to the federal SCC); H.R. 4259, 114th Cong. (2015) (“To prohibit the Administrator of the Environmental Protection Agency from establishing, implementing, or enforcing any limit on the aggregate emissions of carbon dioxide from a State or any category or subcategory of sources within a State.”); H.R.J. Res. 72, 114th Cong. (2015) (providing for congressional disapproval of a rule submitted by the EPA relating to “Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units”); H.R.J. Res. 67, 114th Cong. (2015) (“Disapproving a rule submitted by the Environmental Protection Agency relating to ‘Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units.’”); S.J. Res. 24, 114th Cong. (2015) (providing for congressional disapproval of a rule submitted by the EPA relating to “Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units”); H.R. 2886, 113th Cong. (2013) (targeting the federal SCC for special scrutiny by precluding agencies from using the federal SCC prior to notice and comment and requiring reports to Congress on calculation methods). Republicans also amended appropriations bills to block the Department of Defense and other agencies from considering climate change. See H.R. REP. NO. 114-623, at 12 (2016) (“None of the funds appropriated or otherwise made available in this Act may be used to implement Department of Defense Directive 4715.21 on Climate Change Adaptation and Resilience.”).

33. See, e.g., Susanne Brooks & Martha Roberts, *In Win for Environment, Court Recognizes Social Cost of Carbon*, ENVTL. DEF. FUND (Aug. 29, 2016), <http://blogs.edf.org/markets/2016/08/29/in-win-for-environment-court-recognizes-social-cost-of-carbon/> [<http://perma.cc/DUJ6-U94H>]; Jay Michaelson, *The ‘Social Cost of Carbon’ Is the Most Historic Climate Change Decision Yet*, DAILY BEAST (Aug. 30, 2016, 1:00 AM), <http://www.thedailybeast.com/the-social-cost-of-carbon-is-the-most->

It is undoubtedly true that work on the federal SCC advanced climate change regulation compared to many agencies' prior practice. Because federal agencies' CBAs commonly ignore nonmonetized benefits,<sup>34</sup> failure to place a dollar value on environmental amenities created underregulation. For agencies that were not including these benefits in their analyses, the availability of the federal SCC responded to this problem by providing official values<sup>35</sup> and presumably also signaling the Obama administration's intention to address climate change. By making visible the value of reducing GHGs in the regulatory impact analysis, the federal SCC allowed these benefits to counterbalance implementation costs.<sup>36</sup> Moreover, by incorporating the analysis into OIRA review and including these figures in agencies' findings for adopted regulations, use of the federal SCC prior to President Trump's order may offer some insulation from the Trump administration's retrenchment on global warming regulation when courts review policy reversals.

Although the federal SCC benefits climate regulation in the short run by helping to counteract antiregulatory and anti-science politics, this Article argues that it is ultimately counterproductive because it is inextricably intertwined with broader developments in U.S. administrative law adverse to meaningful climate change policy. While scholars have critiqued both methodological and ethical aspects of the models used to develop the federal SCC, this Article emphasizes different concerns. It contends that the increasing embrace of formalized CBA enforced through OIRA undermines the long-term prospects for effective U.S. climate change policy because it is part of a dysfunctional system of regulatory review. This regulatory review system perpetuates a pernicious (and false) image of conflict between economic and environmental values while obscuring the role of past state action in promoting reliance on fossil fuels. By treating existing resource distributions as a baseline, the oversight system favors the status quo, thus exacerbating cognitive biases that contribute to social and institutional inertia. Formalized CBA itself is fraught with uncertainties and hidden value judgments that become submerged in technical-sounding detail and numeric presentation.

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historic-climate-change-decision-yet [<http://perma.cc/6DMZ-U8PZ>]; Cass R. Sunstein, *A Court Ruling That Could Save the Planet*, BLOOMBERG OPINION (Aug. 12, 2016, 7:30 AM), <http://www.bloomberg.com/view/articles/2016-08-12/a-court-ruling-that-could-save-the-planet> [<http://perma.cc/8HT4-HLT9>].

34. See *infra* Section II for a discussion of how specific federal agencies ignore unmonetized benefits.

35. See INTERAGENCY WORKING GRP. ON SOC. COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866, at 2 (2010) [hereinafter IWG, 2010 TECHNICAL SUPPORT DOCUMENT] ("The purpose of the SCC estimates presented here is to make it possible for agencies to incorporate the social benefits from reducing carbon dioxide emissions into cost-benefit analyses of regulatory actions that have small, or 'marginal,' impacts on cumulative global emissions.").

36. See *id.* at 1–3. The federal SCC also responds to inconsistencies in nascent efforts to calculate a social cost of carbon in the cases where agencies did incorporate climate change benefits into their regulatory impact analyses. See *id.* at 3 (explaining that, prior to development of the federal SCC, "economic analyses for Federal regulations have used a wide range of values to estimate the benefits associated with reducing carbon dioxide emissions").



With climate change this obfuscation proves particularly dangerous because the formality of the presentation normalizes catastrophic risks that stand to propel humanity into an entirely unfamiliar future environment. By analyzing the merits of climate policies through the lens of market impacts far into the future, formalized CBA implies that markets will continue to function even after sea levels rise by one or more meters, half of the currently living species go extinct, coral reefs collapse, temperatures and precipitation diverge dramatically from historical patterns, hurricanes and fires take on unprecedented ferocity, and disease vectors shift into new territories.<sup>37</sup> To understand this quite possible future and its implications requires the ability to imagine future conditions unlike the past upon which we relied in building social and economic systems. CBA appears to be at odds with this form of imagination. Finally, the reduction of complex moral, technological, and epistemological questions to a set of numbers discourages policymakers from developing sufficient humility to recognize our dependence on atmospheric stability and the limits of human control over the natural environment.<sup>38</sup> With climate change, the failure to comprehend these limits facilitates complacency in the face of impending catastrophe.

Absent changes to business-as-usual practices, such as heavy reliance on fossil fuels,<sup>39</sup> the upward emissions trajectory will cause dire consequences within this century: “Without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread and irreversible impacts globally . . . .”<sup>40</sup> Mitigating these risks by rapidly reducing GHG emissions<sup>41</sup> will inevitably necessitate significant changes to energy and transportation systems and infrastructure.<sup>42</sup> In addition to direct resistance from affected industries, efforts to shift existing patterns in these sectors face monumental barriers from

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37. Cf. Douglas A. Kysar, *Politics by Other Meanings: A Comment on “Retaking Rationality Two Years Later,”* 48 HOUS. L. REV. 43, 62 (2011) [hereinafter Kysar, *Politics by Other Meanings*] (“Rather than positing some degree of fundamental dependence between socioeconomic and natural systems, integrated assessment models [used to develop the federal SCC] typically assume that the economy will continue to function more or less as is, even as damages from climate change grow ever larger.”); Michael P. Vandenbergh & Jonathan A. Gilligan, *Macro-Risks: The Challenge for Rational Risk Regulation*, 21 DUKE ENVTL. L. & POL’Y F. 401, 410–413 (2010) (criticizing the use of CBA to regulate climate change because climate change presents a paradigmatic macrorisk with potential to entirely disrupt markets).

38. Cf. Martin L. Weitzman, *On Modeling and Interpreting the Economics of Catastrophic Climate Change*, 91 REV. ECON. & STAT. 1, 1–2 (2009) (describing the “nonnegligible probability of worldwide catastrophe” that presents fat-tailed risks that remain unrecognized in standard CBA but could “turn conventional thin-tail-based climate-change policy advice on its head”).

39. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014 SYNTHESIS REPORT 5 (Rajendra K. Pachauri et al. eds., 2014) [hereinafter IPCC, SYNTHESIS REPORT], <http://archive.ipcc.ch/report/ar5/syr/> [<http://perma.cc/2XRF-XF3X>] (explaining that fossil fuel combustion and industrial processes accounted for roughly 78% of the dramatic rise in carbon dioxide emissions that occurred between 1970 and 2010).

40. *Id.* at 17.

41. *See id.* at 8.

42. *See id.* at 99–102.

physical, economic, and legal inertia.<sup>43</sup> Formalized CBA and regulatory review under OIRA favor the status quo, exacerbating the challenge of reorienting infrastructure and shifting behavioral patterns. Given that continuing along a business-as-usual path will undermine the physical foundations of our society, the legal system must change to alter status quo expectations; to the extent we have seen the appearance of the “cost-benefit state,”<sup>44</sup> it is one of the things that needs to go.

In support of these claims, this Article proceeds as follows. Section I discusses climate change science to illustrate how this issue presents regulators with an urgent and analytically complex set of challenges. It then provides background on the analytical model that regulators apply, distinguishing between an idealized theoretical vision of CBA and practical implementation under OIRA. This Section traces the rise of CBA and formalized regulatory impact assessment over several decades of U.S. presidential administrations. This discussion explains the antiregulatory nature of executive orders that empowered OIRA to oversee agency regulatory rulemaking.

Section II describes an influential 2003 guidance document, OMB Circular A-4, that incorporates an antiregulatory bias into regulatory review. It highlights a maladaptive agency response to the formalization of CBA: a tendency to ignore unmonetized environmental benefits, relegating these issues to a virtual kind of zero zone. This Section then turns to the Ninth Circuit’s ruling in *Center for Biological Diversity v. National Highway Traffic Safety Administration*,<sup>45</sup> a decision finding the agency’s fuel economy standards rulemaking arbitrary and capricious because it gave no value to avoided climate change harms despite basing the standard on monetized costs and benefits.<sup>46</sup>

Section III describes the subsequent development of the federal SCC in response to the Ninth Circuit’s ruling. This discussion assesses the role the federal SCC can play in climate change policymaking. While use of the federal SCC vastly improves upon cost-benefit-based rulemaking that ignores climate change, this Section argues that this effort is ultimately counterproductive because of its place within an analytical structure that preserves the status quo, ignores market distortions that favor fossil fuels, overlooks systems effects, and hinders development of the type of transformational imagination needed for climate change policymaking.

Section IV reconceptualizes CBA’s place in regulatory decisionmaking. It proposes that regulation’s role in technology forcing provides a basis for identifying regulatory contexts unsuited to CBA. Alternatively, it proffers a more substantial change: revising the CBA mandate to be procedural rather than substantive, as seen in environmental analysis under the National Environmental Policy Act (NEPA). Finally, the Article argues that climate change requires a

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43. See *id.* at 94.

44. See SUNSTEIN, COST-BENEFIT STATE, *supra* note 21, at ix.

45. 538 F.3d 1172 (9th Cir. 2008).

46. *Ctr. for Biological Diversity*, 538 F.3d at 1200–01.

full-bore response, akin to what we would expect to see from passengers and crew on a sinking ship. A brief conclusion follows.

I. BACKGROUND: THE COMPLEXITY OF CLIMATE FORECASTING MEETS INSTITUTIONAL PRESSURE TO MONETIZE REGULATORY DECISIONMAKING

A. *Climate Change and Regulatory Complexity*

As the Intergovernmental Panel on Climate Change (IPCC) explained in 2014, “[i]mpacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability.”<sup>47</sup> In October 2018 the IPCC released a special report based on new evidence finding risks to be greater than previously thought for small increases in warming levels.<sup>48</sup>

Even a brief review of basic climate change science and impacts elucidates both the urgency of mitigating climate change and the enormous range of factors that affect any attempt to monetize the benefits of doing so. As the EPA has explained, the composition of the atmosphere includes a balance of gases, including several dubbed “greenhouse gases” for their ability to trap heat.<sup>49</sup> Although the atmosphere’s ability to trap solar radiation provides a degree of warmth essential for humans’ and other species’ survival,<sup>50</sup> human activities that emit GHGs have caused warming gases to accumulate in the atmosphere at concentrations that far exceed naturally occurring levels; since the industrial revolution, human activities—primarily fossil fuel combustion—have caused the atmospheric concentration of GHGs to increase rapidly, reaching levels unprecedented in the last eight hundred thousand years.<sup>51</sup> Roughly 40% of GHGs emitted since 1750 have persisted in the atmosphere while the balance has been captured in natural “sinks,” such as the ocean, plants, and soils, which absorb and store carbon.<sup>52</sup> Since the beginning of the industrial era, the ocean has absorbed a substantial amount of carbon dioxide emissions, increasing the ocean acidity by 26%.<sup>53</sup>

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47. IPCC, SYNTHESIS REPORT, *supra* note 39, at 8.

48. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, GLOBAL WARMING OF 1.5°C: SUMMARY FOR POLICYMAKERS 12 (Valérie Masson-Delmotte et al. eds., 2018) [hereinafter IPCC, GLOBAL WARMING OF 1.5°C].

49. *See, e.g.*, 74 Fed. Reg. 66,499 (2009) (providing background information on GHGs to explain EPA Administrator’s findings).

50. *See* Laurie J. Schmidt, *Scientists Assess Potential for Super Greenhouse Effect in the Earth’s Tropics*, NASA (Mar. 22, 2018), <http://climate.nasa.gov/news/2534/scientists-assess-potential-for-super-greenhouse-effect-in-earths-tropics/> [<http://perma.cc/BAR2-ZLXZ>] (“The greenhouse effect makes our planet habitable.”).

51. *See* IPCC, SYNTHESIS REPORT, *supra* note 39, at 4–5.

52. *Id.* at 44–45.

53. *Id.* at 41.

By increasing the average global temperature, climate change disrupts multiple natural systems.<sup>54</sup> Consequent impacts attributable to climate change include, among other things, extreme weather and temperature events and increases in the frequency and severity of fires, hurricanes, floods, and droughts.<sup>55</sup> The sea level has already begun to rise as glaciers melt and warmer ocean water expands.<sup>56</sup> The levels may increase dramatically if major ice sheets in Greenland, the Arctic, or Antarctica collapse.<sup>57</sup> Rising sea levels not only subject coastal communities to direct threats from inundation, storm surge, and flooding<sup>58</sup> but also, even at low levels, allow salt water to intrude into freshwater ecosystems and impair drinking water systems.<sup>59</sup> Moreover, if emissions continue along a business-as-usual path, a large percentage of species will be committed to extinction by 2100.<sup>60</sup> Climate change poses “risks to health, livelihoods, food security, water supply, human security, and economic growth,” and these risks increase with higher degrees of warming.<sup>61</sup>

The longer emissions continue on an upward trajectory, the more difficult warming becomes to reverse because GHGs accumulate in the atmosphere.<sup>62</sup> Even if all further GHG emissions could be stopped immediately, warming would continue for several decades because some of the effect is delayed.<sup>63</sup> Sophisticated new research published in 2017<sup>64</sup> showed that past emissions have already committed the globe to at least another 2 degrees Fahrenheit of warming by 2100 and that “if current emissions continue for 15 years, odds are good that the planet will see nearly three (1.5C) degrees of warming by then.”<sup>65</sup> The World Meteorological Association projects even higher end of century temperatures:

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54. *See id.* at 47–53 (“In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans.”).

55. *See id.* at 50–53.

56. *Id.* at 42.

57. *Id.* at 72, 74.

58. *Id.* at 67.

59. *Climate Adaptation and Saltwater Intrusion*, EPA, <http://www.epa.gov/arc-x/climate-adaptation-and-saltwater-intrusion> [<http://perma.cc/P6XS-MJH4>] (last visited Feb. 15, 2019) (“As the sea levels rise, the ‘salt front’ (location of the freshwater-saltwater line) may progress further upstream. This encroachment may be further exacerbated by drought, reduced rainfall or changes in water use and demand. Saltwater intrusion can result in the need for water utilities to increase treatment, relocate water intakes, or development [sic] of alternate sources of fresh water.”).

60. *See* IPCC, SYNTHESIS REPORT, *supra* note 39, at 67 (describing how a “large fraction” of species “face[] increased extinction risk due to climate change”).

61. IPCC, GLOBAL WARMING OF 1.5°C, *supra* note 48, at 11.

62. *See* EXEC. OFFICE OF THE PRESIDENT, WHITE HOUSE REPORT: THE COST OF DELAYING ACTION TO STEM CLIMATE CHANGE 2 (2014).

63. *See* Thorsten Mauritsen & Robert Pincus, *Committed Warming Inferred from Observations*, 7 NATURE CLIMATE CHANGE 652, 652–54 (2017).

64. *See id.*

65. *Two Degrees of Warming Already Baked In*, SCIENCE DAILY (July 31, 2017), <http://www.sciencedaily.com/releases/2017/07/170731114534.htm> [<http://perma.cc/Q6XA-7JXX>] (discussing the Mauritsen and Pincus study); *see also* Katherine Trisolini, *Holistic Climate Change Governance: Towards Mitigation and Adaptation Synthesis*, 85 U. COLO. L. REV. 615, 624 (2014) (discussing policymaking implications of committed warming).

“Greenhouse gas concentrations are once again at record levels and if the current trend continues we may see temperature increases 3–5 degrees C by the end of the century.”<sup>66</sup>

Additionally, further emissions at business-as-usual levels increase the risk of sudden catastrophic events<sup>67</sup> and pernicious chain reactions. Human emissions may trigger natural feedback mechanisms that aggravate human-caused warming, such as occurs when melting permafrost releases frozen methane (a potent GHG) and when reflective glacial ice melts creating heat-retaining ocean water.<sup>68</sup>

Although scientists overwhelmingly agree that GHG emissions from human activities are causing the average global temperature to rise,<sup>69</sup> substantial uncertainty remains as to critical components required for projecting the degree of impacts.<sup>70</sup> Unanswered questions remain about the exact relationship between emission levels and atmospheric GHG concentrations as well as the correlation between atmospheric concentrations of GHGs and the consequent extent of global warming, referred to as “climate sensitivity.”<sup>71</sup>

To characterize the sensitivity of the earth’s climate to changes in atmospheric GHG concentrations, scientists create models of equilibrium climate sensitivity.<sup>72</sup> Equilibrium climate sensitivity “is defined as the global mean warming that would occur if the atmospheric carbon dioxide (CO<sub>2</sub>) concentration were instantly doubled and the climate were then brought to equilibrium with that new level of CO<sub>2</sub>.”<sup>73</sup> Although recent research seems to narrow the range of estimates, a 2018 letter in *Nature* explained that “[e]quilibrium climate sensitivity . . . remains one of the most important unknowns in climate change science.”<sup>74</sup> Because multiple components of the earth’s environment interact in complex and nonlinear ways, scientific models cannot precisely identify when emissions could cause natural systems to cross

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66. Tom Miles, *Global Temperatures on Track for 3-5 Degree Rise by 2100: U.N.*, REUTERS (Nov. 29, 2018, 5:40 AM), <http://www.reuters.com/article/us-climate-change-un/global-temperatures-on-track-for-3-5-degree-rise-by-2100-u-n-idUSKCN1NY186> [<http://perma.cc/KBR9-V37K>] (quoting WMO Secretary-General Petteri Taalas’s presentation of “the WMO’s annual statement on the state of the climate”).

67. See EXEC. OFFICE OF THE PRESIDENT, *supra* note 62, at 3.

68. KEVIN SCHAEFER ET AL., UNITED NATIONS ENVIRONMENT PROGRAMME, POLICY IMPLICATIONS OF WARMING PERMAFROST 9, 18 (2011).

69. See IPCC, SYNTHESIS REPORT, *supra* note 39, at 47 (“Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, and in global mean sea level rise; and it is *extremely likely* to have been the dominant cause of the observed warming since the mid-20th century.”)

70. See IPCC, SYNTHESIS REPORT, *supra* note 39, at 58 (“Some of the persistent uncertainties [about future impacts] are grounded in the mechanisms that control the magnitude and pace of climate change. Others emerge from potentially complex interactions between the changing climate and the underlying vulnerability and exposure of people, societies and ecosystems.”).

71. See Peter M. Cox et al., *Emergent Constraint on Equilibrium Climate Sensitivity from Global Temperature Variability*, 553 NATURE 319, 319–22 (2018).

72. See, e.g., *id.* at 319.

73. *Id.*

74. *Id.*

thresholds that would send warming along divergent trajectories.<sup>75</sup> However, a research paper published by the National Academy of Sciences in 2018 contended that “social and technological trends and decisions occurring over the next decade or two could significantly influence the trajectory of the Earth System for tens to hundreds of thousands of years.”<sup>76</sup> Indeed, activities in this immediate time frame could push earth systems on a trajectory toward “conditions that resemble planetary states that were last seen several millions of years ago, conditions that would be inhospitable to current human societies.”<sup>77</sup> In sum, while a critical threshold could be crossed within the next twenty years, scientists cannot currently predict the point at which human emissions will undo the very foundations of our own societies.

In addition to unanswered questions about climate science, attempts to calculate the social cost of carbon depend upon projections over many decades of population, economic activity, energy demand, and energy sources, among other things.<sup>78</sup> After predicting these future conditions, modelers must estimate the degree of harm caused by climate change and translate this harm into dollar figures.<sup>79</sup> The sheer range of effects makes this process complex and uncertain.<sup>80</sup> Next, the monetary translation process adds further complexity because many environmental harms do not involve goods traded in a market.<sup>81</sup> So modelers estimate values using proxy methods—such as willingness-to-pay surveys and revealed preference models<sup>82</sup>—that cannot provide true market equivalents and are subject to a catalogue of theoretical and practical problems.<sup>83</sup> Adding up the value of avoided harms presumptively equates to the total benefit.<sup>84</sup> Of course, properly assessing these values requires that all avoided harms have been captured in the analysis.<sup>85</sup>

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75. Will Steffen et al., *Trajectories of the Earth System in the Anthropocene*, 115 PROC. NAT'L ACADEMIES SCI. 8252, 8253–54 (2018).

76. *Id.* at 8253.

77. *Id.*

78. See, e.g., IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 35, at 25 (noting that their model for calculating the social cost of carbon requires “assumptions about GDP, population, and greenhouse gas emission trajectories after 2100”).

79. *Id.* at 24–25.

80. See *id.* at 25 (“To produce a range of plausible estimates that still reflects the uncertainty in the estimation exercise, the distributions from each of the models and scenarios are equally weighed and combined to produce three separate probability distributions for SCC in a given year . . .”).

81. See Susan Rose-Ackerman, *Putting Cost-Benefit Analysis in Its Place: Rethinking Regulatory Review*, 65 U. MIAMI L. REV. 335, 346 (2011) (“[T]he market does not price . . . the value of natural objects . . .”).

82. See OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8, at 19–20.

83. See Mandel & Gathii, *supra* note 21, at 1046–47.

84. See Amy Sinden, *Formality and Informality in Cost-Benefit Analysis*, 2015 UTAH L. REV. 93, 98 n.8 [hereinafter Sinden, *Formality and Informality*] (discussing the process of adding up total costs and benefits for CBA).

85. See Mandel & Gathii, *supra* note 21, at 1045–47 (“The majority of threats create not only monetizable costs and benefits, but also nonmonetizable ones. Even if cost-benefit analysis could monetize the value of a child’s life, for example, Sunstein appears to recognize that the manner of cost-benefit analysis proposed still does not account for values or costs associated with nonmonetizable

After working through all of these hurdles to value the benefits of avoiding climate change, models follow common cost-benefit practice by discounting the value of future benefits.<sup>86</sup> As discussed below, the appropriate discount rate itself is highly contested and many reputable commentators question the ethics of any degree of discounting.<sup>87</sup> At the same time, given that climate change can impose harms far into the future, variations in the discount rate used by modelers can lead to vastly different assessments of costs and benefits.<sup>88</sup>

Given these challenges and the stakes of getting it wrong, why approach climate change policymaking through this method at all? No doubt, Sunstein and others believed that developing the federal SCC would advance climate policy by spurring policymakers to act and providing legally defensible analytical support for agency rulemaking (a role it indeed played in the Obama administration).<sup>89</sup> But the entrenchment of CBA in the U.S. system of administrative law also has made the analysis seem to be an essential prerequisite to agency regulation of GHGs. Unfortunately, the system of regulatory impact analysis suffers from severe flaws that make it unsuitable for climate policymaking in the long run.

#### B. *The Appealing Theory: A Model for Efficient and Rational Regulation*

At first blush, the idea that agencies should subject regulations to CBA seems almost intuitively obvious. In the abstract, the concept seems to be captured aptly in analogies to the daily decision-making tradeoffs made by

impacts, such as the destruction of coral reefs, human physical and emotional suffering short of fatality, or the extinction of species.”); cf. Jonathan S. Masur & Eric A. Posner, *Unquantified Benefits and the Problem of Regulation Under Uncertainty*, 102 CORNELL L. REV. 87, 92 (2016) [hereinafter Masur & Posner, *Unquantified Benefits*] (arguing that “agencies’ failures to quantify benefits are almost certainly masking errors of over-regulation and under-regulation”).

86. See Mandel & Gathii, *supra* note 21, at 1047–48 (discussing the practice of discounting future lives in CBA); Thomas O. McGarity, *Regulatory Analysis and Regulatory Reform*, 65 TEX. L. REV. 1243, 1295–96 (1987) [hereinafter McGarity, *Regulatory Analysis and Regulatory Reform*].

87. See Mandel & Gathii, *supra* note 21, at 1048 (noting “substantial disagreement” about the discount rate). See also *infra* notes 126–31 and accompanying text for a discussion of discounting future lives.

88. Mandel & Gathii, *supra* note 21, at 1048; see also WILLIAM NORDHAUS, A QUESTION OF BALANCE: WEIGHING THE OPTIONS ON GLOBAL WARMING POLICIES 10–11 (2008) [hereinafter NORDHAUS, A QUESTION OF BALANCE] (“The choice of an appropriate discount rate is particularly important for climate-change policies because most of the impacts are far in the future. . . . With a higher discount rate, future damages look smaller, and we do less emissions reduction today; with a lower discount rate, future damages look larger, and we do more emissions reductions today.”); Kysar, *Politics by Other Meanings*, *supra* note 37, at 65 (“[I]n the climate change context, whether and how to discount exerts enormous influence on policy recommendations . . .”).

89. Cf. Cass R. Sunstein, *Changing Climate Change, 2009–2016*, 42 HARV. ENVTL. L. REV. 231, 234–36 (2018) (describing the federal SCC as the “linchpin” of federal climate change policy and his participation in developing numerous executive branch climate change initiatives during the Obama administration); Michael Greenstone & Cass R. Sunstein, Opinion, *Donald Trump Should Know: This Is What Climate Change Costs Us*, N.Y. TIMES (Dec. 15, 2016), <http://nyti.ms/2hTtY64> [<http://perma.cc/CYA7-FPZ4>].

average citizens choosing how to spend limited resources.<sup>90</sup> Who would not want to have government make sensible and efficient use of resources?<sup>91</sup>

Descriptions of the CBA process can sound beguilingly clear cut. As Sunstein explained in *The Cost-Benefit State*: “The basic ideas are simple: Agencies should be required to investigate both costs and benefits, to show that benefits justify costs in most circumstances, and to offer a reasonable explanation for any decision to proceed when costs exceed benefits.”<sup>92</sup> Yet the devil is in the details when applying this appealing-sounding formula. Unfortunately, counting up benefits and costs is not so simple, and what counts as a “reasonable explanation” for not adopting the purportedly most efficient option is not at all obvious.<sup>93</sup> These details present numerous theoretical problems that, at best, lack clear answers and, at worst, mask normative commitments behind an air of scientific neutrality.<sup>94</sup>

A primary justification for OIRA oversight and formalized CBA stems from a questionable vision of agency culture and practice. Proponents presume that administrative agencies will systematically overregulate if not subjected to a checking mechanism.<sup>95</sup> As described further below, this presumption is reflected in the structure of the OIRA oversight process, which places the burden on

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90. See, e.g., Calandrillo, *supra* note 21, at 979–82 (arguing that citizens routinely make implicit CBAs in daily life and that the impossibility of creating a risk-free society combined with limited resources necessitates CBA).

91. It is important to distinguish between formal CBA used to determine the purportedly optimal level of risk versus using cost-effectiveness analysis to find the least costly way to meet specific health or safety goals. The latter involves evaluating impacts among regulatory options for a policy goal that has already been agreed upon. I suspect that many Americans imagine that politicians are talking about the latter idea when they envision efficient government. Yet CBA pursuant to executive orders is used to set the initial goals themselves, a distinction likely lost on citizens and politicians not steeped in the nuances of the subject.

92. SUNSTEIN, *COST-BENEFIT STATE*, *supra* note 21, at 22.

93. See *supra* notes 81–88 and accompanying text for a discussion of the difficulties in properly valuing the costs and benefits.

94. See Rose-Ackerman, *supra* note 81, at 338 (“[D]ifficult issues arise even if net-benefit maximization is a plausible public goal. In the best case for cost-benefit analysis, . . . the main problems are measurement difficulties that are sometimes so fundamental that better analysis or consultation with experts cannot solve them. I am thinking mainly of debates over the proper discount rate for future benefits and costs; efforts to incorporate attitudes toward risk; and the vexing problems of measuring the value of human life, of aesthetic and cultural benefits, and of harm to the natural world. Disputes over these issues turn on deep philosophical questions—for example, valuing future generations versus balancing capital and labor in the production of goods and services; acknowledging the value of extra years of life versus ‘life’ itself; taking risk preferences into account; and giving culture, ecosystems, and natural objects a place in the calculus. These issues do not have ‘right’ answers within economics. They should not be obscured by efforts to put them under the rubric of a CBA.”).

95. See Richard W. Parker, *Grading the Government*, 70 U. CHI. L. REV. 1345, 1347 (2003) (“[T]he recent wave of regulatory skepticism is distinct from earlier attitudes. . . . [T]he modern critique is led by charges that agencies—driven by ideology, bureaucratic ambition, or ‘public interest’ pressures—are regulating too strictly and too much. And the cure offered by these critics is not more or better representation in the rulemaking processes as in the past, but more analysis and searching outside review.”).



agencies to justify new regulations.<sup>96</sup> Both the theory and the process treat regulations as an impediment to presumptively beneficial private market activity.<sup>97</sup>

Sunstein recognizes that the growth of CBA since the 1970s fundamentally changed the government's approach to regulating risk.<sup>98</sup> Despite the dramatic nature of the change, he has argued that the aspirations for CBA are rather "mundane," aiming merely to improve regulatory tools rather than to set governmental agendas on controversial topics.<sup>99</sup> Sunstein has contended that CBA directly redresses three problems that he believes can compromise governmental programs to reduce risk: "poor priority setting, excessively costly tools, and inattention to the unfortunate side effects of regulation."<sup>100</sup>

Sunstein's enthusiasm for CBA stems less from a direct emphasis on economic efficiency and more from his longstanding concern that laypeople think irrationally about risk.<sup>101</sup> He worries that cognitive biases distort citizens' perceptions, prompting them to pressure policymakers to adopt suboptimal policies.<sup>102</sup> The availability heuristic and related biases cause the public to overestimate risk from disasters that appear frequently in news stories, such as terrorist attacks or plane crashes.<sup>103</sup> Hence, Sunstein suspects that the public will demand overregulation of low probability events while ignoring more mundane (but actually more significant) threats, such as cigarette smoking and poor eating habits.<sup>104</sup> As he explained, "The availability heuristic . . . can produce substantial

96. See *infra* Parts II.A–B.

97. E.g., Exec. Order No. 12,866, 3 C.F.R. § 638 (1994) (stating the importance of private markets for the best economic growth). See also *infra* Part I.C for an analysis of the U.S. government's antiregulatory structure.

98. SUNSTEIN, COST-BENEFIT STATE, *supra* note 21, at 3.

99. *Id.* at 6.

100. *Id.*

101. See *id.* at 139 ("The best defense of cost-benefit analysis relies not on controversial claims from neoclassical economics, but on a simple appreciation of how we all make mistakes in thinking about risks—and on an understanding that when people err, governments will err too."); Amy Sinden, *Cass Sunstein's Cost-Benefit Lite: Economics for Liberals*, 29 COLUM. J. ENVTL. L. 191, 203–04 (2004) ("At least when it comes to government decision-making, . . . Sunstein has always remained open to the possibility that CBA might be defended on purely 'pragmatic' grounds as an imperfect but still useful approximation of reality. In 1994, he said, 'CBA may offer a less than full description of what is really at stake, but perhaps it counteracts the forms of inconsistency and ultimate irrationality that result in the public sector if we proceed without quantitative help.'" (quoting Cass R. Sunstein, *Incommensurability and Valuation in Law*, 92 MICH. L. REV. 779, 842 (1994))); see also Timur Kuran & Cass R. Sunstein, *Controlling Availability Cascades* (describing CBA under OIRA review as a remedy to the use of availability heuristics to make decisions), in *BEHAVIORAL LAW AND ECONOMICS* 374, 392–93 (Cass R. Sunstein ed., 2000).

102. See Kuran & Sunstein, *supra* note 101, at 380–88 (discussing the public's fixation on unthreatening hazards and its lack of concern about more serious health hazards and that availability cascades create serious problems for democracy as public opinion about the regulation of risks constitutes a highly problematic basis for government policy).

103. See *id.*

104. SUNSTEIN, RISK AND REASON, *supra* note 21, at 84 ("What explains widespread public fixations on unthreatening waste dumps, relatively harmless chemicals, and shark attacks, when for years on end far more serious health hazards, such as cigarette smoking, indoor air pollution, 'junk

distortions whenever some dangers are easier to imagine than others.”<sup>105</sup> This cognitive distortion produces “major errors” in people’s risk perception, causing them to “grossly underestimat[e] dangers that are not highly publicized” and to “grossly overestimate” risks that appear frequently in the media.<sup>106</sup>

This effect is compounded by additional cognitive biases, including availability cascades.<sup>107</sup> Those who can benefit from shifting public perception of specific risks (“availability entrepreneurs”) exploit these dynamics, “seiz[ing] on selected incidents and publiciz[ing] them to make them generally salient to the public.”<sup>108</sup> These “availability campaigns” sometimes prompt appropriate reactions to neglected risks.<sup>109</sup> However, because they also compound cognitive errors, Sunstein has argued that these influences on public opinion necessitate “institutional safeguards” to “ensure better priority-setting and fuller use of scientific knowledge.”<sup>110</sup> Sunstein believes that CBA can help prevent administrators from caving in to public pressure, or at least temper their response to demands to overregulate because of irrational fears.<sup>111</sup>

Despite generally arguing for widespread application of CBA, Sunstein recognizes two circumstances—one technical and one philosophical—in which it is inappropriate. First, he observes that attempting to quantify some highly uncertain benefits—such as prevention of terrorism through airport security—would be “silly” given the fundamental unpredictability of terrorist acts.<sup>112</sup> Second, he views some legal rules as essential to theoretical commitments that cannot meaningfully be translated into cost-benefit terms.<sup>113</sup> Thus, he contrasts rules designed to meet nonquantifiable commitments—such as protecting individual rights and preventing irreversible species’ losses—with harms that require regulators to select among degrees of risk<sup>114</sup>:

Where regulatory policy is designed to ensure against irreversible damage, or otherwise to prevent the violation of rights, the cost-benefit default principles might well be displaced. In most domains of regulatory policy, however, what is involved is not the danger of irreversible loss but instead issues of degree, and hence the presumption remains intact.<sup>115</sup>

Sunstein views most regulation as falling into this latter category; therefore, he considers the majority of regulatory issues to be well suited to CBA.<sup>116</sup>

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food’ consumption, and asthma in the inner city have commanded comparatively little attention?”).

105. *Id.* at 85.

106. *Id.*

107. *Id.* at 86–87.

108. *Id.* at 93.

109. *Id.* at 92–93.

110. *Id.* at 92.

111. *Id.* at 107.

112. SUNSTEIN, COST-BENEFIT STATE, *supra* note 21, at 21.

113. *Id.* at 68–69.

114. *Id.* at 68.

115. *Id.* at 69.

116. *Id.*

Consequently, he has argued for more expansive adoption of this tool in several writings.<sup>117</sup>

Sunstein's concerns with the cognitive biases that impair policymaking about risk and his confidence in the ability of CBA to correct these errors lead him to endorse a broad adoption of CBA.<sup>118</sup> Yet these very concerns counsel against current practices under OIRA oversight because the process has many elements that work against rational decisionmaking. Unfortunately, the unquantifiable nature of many benefits, the resources required to gather information where available, and the executive branch's focus on formal CBA have prompted a highly irrational agency practice of overlooking unmonetized benefits.<sup>119</sup> Moreover, the practice of CBA under OIRA supervision reinforces other cognitive biases, such as the status quo bias, loss aversion, and endowment effects.<sup>120</sup> By incorporating a presumption against regulations, the process exacerbates inertia in social, economic, and legal systems that irrationally impedes efforts to respond to climate change.<sup>121</sup> As discussed below, these antiregulatory biases appeared in executive orders from presidents of both parties.<sup>122</sup>

Sunstein's own view of areas unsuited to CBA could easily be understood to apply to climate change regulation. Unanswered and unanswerable ethical questions pervade formal CBA, particularly where climate change is concerned. Many of these could be understood to serve nonquantifiable commitments, such as avoiding "knowing killing."<sup>123</sup> The uniqueness of Earth's habitability for

117. See, e.g., *id.* at 20; SUNSTEIN, RISK AND REASON, *supra* note 21, at 106–113; CASS R. SUNSTEIN, SIMPLER 151–55 (2014) [hereinafter SUNSTEIN, SIMPLER]; Kuran & Sunstein, *supra* note 101, at 390, 392; Cass R. Sunstein, *Factions, Self-Interest, and the APA: Four Lessons Since 1946*, 72 VA. L. REV. 271, 293 (1986) (arguing that the OMB may be better positioned than the courts to remedy these malfunctions because it can supervise agencies more generally rather than considering their problems only in response to specific litigation).

118. See, e.g., SUNSTEIN, RISK AND REASON, *supra* note 21, at 108–12.

119. See Nick Hodges, *Solving the Zero Problem: Marginal Analysis as a Second Best Alternative to Cost-Benefit Analysis*, 27 STAN. L. & POL'Y REV. 159, 162–64, 168–69 (2016) (arguing that formalized CBA creates a "zero problem," which "biases regulation against difficult-to-quantify benefits, . . . erodes the legitimacy of agency policymaking[.] [a]nd . . . generate[s] focal points that divert attention away from the important issues targeted by a given regulation"); Douglas A. Kysar, *Fish Tales* [hereinafter Kysar, *Fish Tales*], in REFORMING REGULATORY IMPACT ANALYSIS 190, 195 (Winston Harrington et al. eds., 2009).

120. See Daniel Kahneman et al., *Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias*, 5 J. ECON. PERSP. 193, 197–203 (1991) (explaining how each of these three cognitive biases manifests in practice).

121. 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, 138 (2014) ("[T]he United States' inertia [in CBA analytical models]—its attachment to existing, flawed policy and to existing, irrational tactics for regulatory analysis—is imperiling hundreds of millions of lives of real people . . .").

122. See *infra* Part I.C for a discussion of relevant executive orders made by Presidents Reagan, Clinton, George W. Bush, and Obama.

123. See Lisa Heinzerling, *Knowing Killing and Environmental Law*, 14 N.Y.U. ENVTL. L.J. 521, 521 (2006) [hereinafter Heinzerling, *Knowing Killing*] ("I simply wish to defend the view that the moral commitment against knowing killing should play a role in decisions about environmental problems. In recent years, economic analysis has substantially succeeded in de-ethicizing

humans and the potential irreversibility of its destruction seem like a larger-scale analogy to the permanent loss of an endangered species that Sunstein recognizes as an appropriate exception. Indeed, as discussed above, scientists recognize that current emission trajectories commit large portions of individual species and ecosystems to extinction.<sup>124</sup>

Despite CBA's policymaking triumph, both its theory and practice have received sustained academic criticism.<sup>125</sup> Among the theoretical challenges most relevant to climate policy, discounting costs and benefits over time presents analytical complexities and ethical dilemmas that have not been (and probably could not be) ultimately resolved.

Discounting purports to reflect the greater value placed on a sum of money received presently versus in the future.<sup>126</sup> While its applicability to individual investment decisions is well accepted, translation of this concept into public policies regarding environmental, health, and safety risks raises important ethical issues.<sup>127</sup> As Lisa Heinzerling explained, "[T]he federal government has embraced an assumption that we value future harms *less* than present harms, and that, even when it comes to human life, the appropriate tradeoff between present and future life-saving can usually be struck by consulting prevailing rates of return on financial investments;" Heinzerling contended that this approach is "seriously misguided."<sup>128</sup> Because the impacts of climate change extend far into the future, any estimate of the social cost of carbon (including the federal SCC) depends upon intergenerational discounting,<sup>129</sup> thus exacerbating ethical concern because future generations cannot protect themselves in the process.<sup>130</sup>

Discounting also presents significant practical challenges as evidenced by disagreement over the appropriate rate.<sup>131</sup> No current consensus exists about the appropriate rate and future agreement is unlikely because no objective basis exists for setting the discount rate. Rather, it is a question of judgment that inevitably includes many assumptions about ethics, markets, people's level of

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environmental issues; this paper is part of an effort to re-ethicize them.").

124. See *supra* note 60 and accompanying text.

125. See *supra* note 21 for a collection of sources criticizing CBA.

126. See Lisa Heinzerling, *Discounting Our Future*, 34 LAND & WATER L. REV. 39, 41 (1999) [hereinafter Heinzerling, *Discounting Our Future*] ("Quite apart from the effect of inflation, the time value of money means that money received later is worth less than the same amount of money received earlier; while one waits for the later money to arrive, one could have been investing the earlier money in some other venture.").

127. *Id.*

128. *Id.* at 40.

129. See *id.* at 47.

130. See Gregory Scott Crespi, *Cost-Benefit Analysis: Not a Suitable Approach for Evaluating Climate Regulation Policies*, 2 WASH. & LEE J. ENERGY CLIMATE & ENV'T 227, 229-31 (2011); Kysar, *Politics by Other Meanings*, *supra* note 37, at 64-65 ("Discounting is a crude and misleading way to incorporate matters of intergenerational ethics and distributive equity into the welfare-maximization exercise."); Heinzerling, *Discounting Our Future*, *supra* note 126, at 47 (discussing intergenerational discounting).

131. See Heinzerling, *Discounting Our Future*, *supra* note 126, at 42; see also *supra* notes 83-88 and accompanying text.

risk aversion, and predictions of future wealth. While economists are unlikely to find a “correct” discount rate, the selection of a rate in IAMs dramatically influences the value that models assign to the social cost of carbon.<sup>132</sup>

Critics have also identified an imbalance in the analysis of costs versus benefits that will often skew against tighter regulation.<sup>133</sup> Much regulatory effort aims to protect nonmarket goods that are difficult to precisely monetize, such as biodiversity, public health, and human life.<sup>134</sup> Agencies with limited resources must work to find proxy numbers for the value of avoiding these harms.<sup>135</sup> In contrast, regulated industries have immediate incentives to present compliance costs to agencies when commenting on proposed rules.<sup>136</sup> In addition to these theoretical and technical challenges, some critics see a “darker” potential.<sup>137</sup> Formal CBA can “camouflage” policy decisions, actually “reducing the transparency of a rulemaking process.”<sup>138</sup> In a related vein, it can also be used as “a tool of political struggle over the distribution of rents.”<sup>139</sup>

Despite robust criticisms of both the theory and practice of formal CBA, academic proponents have succeeded in substantially influencing U.S. policymakers,<sup>140</sup> facilitating a substantial shift in administrative law in the last few decades. Indeed, given this success and the role it now plays in regulatory governance, Richard Revesz and Michael Livermore have urged proregulatory critics to embrace CBA so that they can help make it a better and more balanced tool.<sup>141</sup> In *Retaking Rationality*, they argued that opponents have ceded

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132. See Daniel A. Farber, *Coping with Uncertainty: Cost-Benefit Analysis, the Precautionary Principle, and Climate Change*, 90 WASH. L. REV. 1659, 1695 (2015) [hereinafter Farber, *Coping with Uncertainty*] (explaining that “over multiple decadal time scales, a minor shift in the discount rate can dramatically impact the analysis of whether additional precautions are warranted.”).

133. See Hodges, *supra* note 119, at 168–70 (describing how many benefits are difficult to quantify and therefore skew CBAs).

134. John C. Coates IV, *Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications*, 124 YALE L.J. 882, 894 (2015).

135. See *id.* at 895.

136. See *id.* at 942 (noting that regulated financial firms “have incentives to exaggerate costs in public comments”).

137. See *id.* at 899.

138. *Id.*

139. *Id.* at 900.

140. See, e.g., OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8, at 1. Circular A-4, an OMB Circular that provides guidance for agency heads on how to conduct CBA, lists peer reviewers from multiple academic institutions. *Id.* (“This Circular provides the Office of Management and Budget’s (OMB’s) guidance to Federal agencies on the development of regulatory analysis as required under Section 6(a)(3)(c) of Executive Order 12866 . . . . Peer reviewers included Cass Sunstein, University of Chicago; Lester Lave, Carnegie Mellon University; Milton C. Weinstein and James K. Hammitt of the Harvard School of Public Health; Kerry Smith, North Carolina State University; Jonathan Weiner, Duke University Law School; Douglas K. Owens, Stanford University; and W. Kip Viscusi, Harvard Law School.”).

141. RICHARD L. REVEZ & MICHAEL A. LIVERMORE, *RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH* 10 (2008) (“[T]his book argues that progressive groups should seek to mend, not end, cost-benefit analysis.”).

development of this administrative law tool to its advocates, allowing CBA to develop in a lopsided manner without sufficient input.<sup>142</sup>

Before proceeding, it is important to clarify precisely what practice this Article evaluates. As Amy Sinden cogently explained, scholars frequently fail to distinguish between informal and formal approaches to CBA and consequently talk past each other:

The two ends of this spectrum actually have very little in common, other than the general approach of juxtaposing positive and negative impacts. Informal CBA relies on qualitative descriptions intuitively compared and gives no more than general guidance. The most formal varieties of CBA, on the other hand, rely on numbers and mathematics and purport, at least, to provide precise answers. Moreover, the two techniques play entirely different roles in the decisionmaking process. Informal CBA provides no more than a secondary check on a decision that has been made by other means, while formal CBA provides, at least in theory, a standard-setting tool for identifying the optimal choice from among a whole range of regulatory alternatives.<sup>143</sup>

This Article evaluates the process of formal CBA conducted pursuant to presidential orders and supervised by OIRA. CBA as currently understood in U.S. administrative law is closely identified with a specific approach: OIRA review under executive orders.<sup>144</sup> This highly formalized practice has played a central role in regulatory policy over the last few decades.<sup>145</sup> In fact, its dominance necessitated development of the federal SCC in order for climate change impacts to be consistently included in regulatory decisionmaking.<sup>146</sup> The impacts of this practice on climate change regulation generally and on development of the federal SCC specifically are the focus of the balance of this Article. The following Part provides background on the series of executive orders that gave rise to OIRA's gatekeeping function.

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142. *Id.* at 10–11.

143. Sinden, *Formality and Informality*, *supra* note 84, at 96–97 (“Despite this broad range of meanings, scholars and policymakers often use the term ‘cost-benefit analysis’ (or ‘benefit-cost analysis’), without adjectives or qualifiers, as though it were a monolithic concept. This failure to distinguish between the many varieties of CBA muddies the debate and can lead to irrational results that are, ironically, completely at odds with . . . common sense and reasonableness . . .” (footnote omitted)).

144. *See, e.g.*, REVESZ & LIVERMORE, *supra* note 141, at 151 (“[C]ost-benefit analysis has been closely associated with OMB review since President Reagan’s executive order was adopted in 1981.”); McGarity, *Regulatory Analysis and Regulatory Reform*, *supra* note 86, at 1293 (“Although the particular brand of regulatory analysis that has acquired the label ‘cost-benefit analysis’ is not essential to comprehensive analytical rationality, it is so closely associated with regulatory analysis in the minds of its principal practitioners that its special problems must be examined in any general discussion of the limitations of regulatory analysis.”).

145. *See infra* Part I.C.

146. *See infra* Part II.C.

C. *The Practice: Formal and Antiregulatory*

Regulatory review under OIRA originated under President Reagan to further his antiregulatory policy agenda that treated government interference with (purportedly) private markets as inefficient at best and undemocratic at worst.<sup>147</sup> As reflected in the language of his and subsequent Presidents' executive orders discussed below, the system of regulatory impact assessment with OIRA oversight favors market-based private ordering over government regulation. At the same time, it treats existing resource distributions as a natural baseline, ignoring past policies that distorted both markets and resource allocation.<sup>148</sup>

The process is structurally biased against regulation because it burdens agencies with a requirement to justify new regulations.<sup>149</sup> Commentators have also observed an implementation bias against regulation in OIRA practice that serves to exacerbate the impact of this antiregulatory structure.<sup>150</sup>

Although prior administrations had initiated some form of regulatory review,<sup>151</sup> President Reagan's issuance of Executive Order 12,291 in 1981 marked a substantial shift in agency administration by centralizing oversight to better control compliance with the President's favored economic theories.<sup>152</sup> As

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147. See Sinden, *Formality and Informality*, *supra* note 84, at 149 n.220 ("The antiregulatory mission of the Reagan Executive Order was made clear in its preamble, which stated that the purpose of the executive order was, *inter alia*, 'to reduce the burdens of existing and future regulations.'" (quoting Exec. Order No. 12,291 pmb., 3 C.F.R. § 127 (1982))).

148. See *infra* Part III.B for a discussion of the United States' history of subsidizing the fossil fuel industry, which has distorted U.S. markets and prices in favor of the industry.

149. See REVESZ & LIVERMORE, *supra* note 141, at 152.

150. See Farber, *Rethinking*, *supra* note 17, at 1366–67 ("The way that CBA is implemented suggests a deregulatory bias, and more direct evidence of such a bias also exists. A study of the experience of appointed EPA officials (including those from Republican administrations) found that, regardless of the presidential administration, OIRA mainly functioned to undercut regulation: 'When asked what kind of changes OIRA sought after performing cost-benefit analysis, 89% of respondents stated that OIRA never or only rarely sought changes that would make a regulation more protective of human health and the environment. In addition, 75% said that OIRA often or always sought changes that would make a regulation less protective of human health and the environment. When asked to what extent OIRA sought changes that would make a regulation less burdensome for regulated entities, 89% answered often or always. When asked to what extent OIRA sought changes that would make a regulation more burdensome for regulated entities, 89% answered never or rarely.'" (quoting Lisa Schultz Bressman & Michael P. Vandenbergh, *Inside the Administrative State: A Critical Look at the Practice of Presidential Control*, 105 MICH. L. REV. 47, 72–74 (2006))).

151. See McGarity, *Regulatory Analysis and Regulatory Reform*, *supra* note 86, at 1248 (describing provisions under Presidents Nixon, Ford, and Carter).

152. See Richard H. Pildes & Cass R. Sunstein, *Reinventing the Regulatory State*, 62 U. CHI. L. REV. 1, 3 (1995) ("Probably the most important development in administrative law in the 1980s came . . . from Presidents Ronald Reagan and George Bush. In two executive orders, President Reagan asserted vigorous centralized control over the regulatory process . . . [Reagan's Executive Order 12,291] promote[d] centralized OMB control of the regulatory process, to be conducted in accordance with presidential policies favoring deregulation and close attention to cost."). *But see* Jim Tozzi, *OIRA's Formative Years: The Historical Record of Centralized Regulatory Review Preceding OIRA's Founding*, 63 ADMIN. L. REV. 37, 67 (2011) ("[I]t should be recognized that the blueprint for centralized review of regulations was crafted in the Johnson Administration and the first OMB central review of agency regulations began in the Nixon Administration—years before OIRA existed.").

the *New York Times* reported in 1981, “When President Reagan signed Executive Order 12291 . . . , he transformed with a stroke of his pen what had been a useful economic tool into an imperative of Federal decision making.”<sup>153</sup>

Executive Order 12,291 mandated that agencies not promulgate major regulations unless the projected benefits would be greater than costs.<sup>154</sup> As described below, although formally procedural, these provisions promoted President Reagan’s substantive antiregulatory agenda by presuming an unregulated marketplace as a baseline and placing the burden of proof on agencies to justify new regulations. Despite some variation in the details, all subsequent presidents have retained this general approach, perpetuating CBA requirements under OMB oversight.

The stated purpose of President Reagan’s order was “to reduce the burdens of existing and future regulations, increase agency accountability . . . , provide for presidential oversight . . . , and insure well-reasoned regulations.”<sup>155</sup> To this end, it required administrative agencies to justify the need for new, revised, and proposed regulations and to describe their anticipated consequences.<sup>156</sup> In addition to demanding a showing that “the potential benefits to society for the regulation outweigh the potential costs,” it directed agencies to “maximize the net benefits” while choosing the alternative with the “least net cost to society.”<sup>157</sup> These principles applied both to individual regulations and to regulatory priorities in agency agendas more broadly.<sup>158</sup> Agencies were required to produce a Regulatory Impact Analysis (RIA) for major rulemakings that would do several things: describe potential costs and benefits of the rule, identify the likely recipients of those costs and benefits, determine the rule’s net benefits, and describe lower-cost alternatives and the basis for not adopting them.<sup>159</sup>

President Reagan empowered OMB to oversee executive agencies, to review their RIAs, and to ensure that they based major new regulations on CBA.<sup>160</sup> This oversight role (ultimately placed within OIRA)<sup>161</sup> authorized the

153. Philip Shabecoff, *Reagan Order on Cost-Benefit Analysis Stirs Economic and Political Debate*, N.Y. TIMES (Nov. 7, 1981), <http://nyti.ms/2zNmWLD> [<http://perma.cc/7PB4-Z4LN>].

154. Exec. Order No. 12,291 § 2(b), 3 C.F.R. § 128 (1982).

155. *Id.* pmb1., 3 C.F.R. § 127.

156. *See id.* §§ 2(b), 3–4, 3 C.F.R. §§ 128–130.

157. *Id.* § 2(b)–(d), 3 C.F.R. § 128.

158. *Id.* § 2, 3 C.F.R. § 128 (providing requirements for new and existing regulations and directing agencies to “set regulatory priorities with the aim of maximizing the aggregate net benefits to society”).

159. *Id.* § 3(d), 3 C.F.R. § 129.

160. *See* Wendy E. Wagner, *A Place for Agency Expertise: Reconciling Agency Expertise with Presidential Power*, 115 COLO. L. REV. 2019, 2032 (2015) (“President Ronald Reagan was particularly concerned about ensuring that his political priorities were reflected in the large number of individual agency rules, or at least the most significant ones, leading him to establish the concept of a White House review process. President Reagan’s bold Executive Order tasked a small agency within the Office of Management and Budget (OMB)—OIRA—with the responsibility for ensuring both that agencies prepared cost-benefit analyses on significant rules and that the agencies’ most significant rules were ‘cleared’ through the White House before being made public.” (footnote omitted)).

161. MAEVE P. CAREY, CONG. RESEARCH SERV., R41974, COST-BENEFIT AND OTHER



Director of OMB to “[d]esignate any proposed or existing rule as a major rule” and hence subject it to OMB review.<sup>162</sup> The order authorized OMB (now OIRA) to monitor agency compliance with the provisions for regulatory impact analysis and CBA.<sup>163</sup> Although it did not create specific penalties for noncompliance, the order did empower the Director to report to the President on agency activities and to propose changes to an agency’s authorizing statute.<sup>164</sup> Thus, OMB review has carried the implicit threat that noncompliant agencies could face unwanted presidential and congressional scrutiny, potentially prompting presidential removal of agency heads or amendment of authorizing statutes.

Although observers anticipated that President Clinton would eliminate both OIRA oversight and the analytical requirements of President Reagan’s executive order, he did not.<sup>165</sup> Not only did President Clinton essentially retain President Reagan’s approach,<sup>166</sup> but the opening statement in his Executive Order 12,866 also extolled the virtues of private markets and bemoaned the then-current state of affairs for imposing unnecessary and burdensome regulations on industry:

The American people deserve a regulatory system that works for them, not against them: a regulatory system that protects and improves their health, safety, environment, and well-being and improves the performance of the economy without imposing unacceptable or unreasonable costs on society; regulatory policies that recognize that the private sector and private markets are the best engine for economic growth; . . . and regulations that are effective, consistent, sensible, and understandable. We do not have such a regulatory system today.<sup>167</sup>

President Clinton’s executive order endorsed the view that regulation risks interference with otherwise effective private ordering through markets, referring to private sector markets as the “best engine for economic growth.”<sup>168</sup> Although subsequent sections identified additional values such as “flexibility,” and “equity,”<sup>169</sup> President Clinton’s order continued to serve as the basis for formal CBA under OIRA despite some enforcement variation from the Reagan or Bush I administrations.<sup>170</sup>

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162. See Exec. Order No. 12,291 §§ 3, 6(a)(1), 3 C.F.R. §§ 128–131. The Director could also require agencies to gather and analyze additional data, develop new analytical methodologies, and coordinate regulatory efforts with other agencies. *Id.* § 6(a)(3), (6)–(8), 3 C.F.R. § 131.

163. *Id.* § 6(a)(8), 3 C.F.R. § 131.

164. *Id.* § 6(a)(7), 3 C.F.R. § 131.

165. See Pildes & Sunstein, *supra* note 152, at 6.

166. *Id.*

167. Exec. Order No. 12,866 pmbL., 3 C.F.R. § 638.

168. *Id.*

169. See *id.* § 1(b)(5), 3 C.F.R. § 639 (“When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. In doing so, each agency shall consider incentives for innovation, consistency, predictability, the costs of enforcement and compliance (to the government, regulated entities, and the public), flexibility, distributive impacts, and equity.”).

170. See Kuran & Sunstein, *supra* note 101, at 392 (“Under Reagan and Bush [I], OIRA operated essentially as a ‘cost-benefit’ monitor that intervened in an ad hoc way to force the reconsideration of inefficient or excessive regulations. President Clinton, who has taken steps of his

The Bush II administration embraced CBA, applying it as a tool to block or weaken many regulations from seemingly “liberal” agencies and to further enhance executive power.<sup>171</sup> According to a report by the Congressional Research Service, during the Bush II administration OIRA took a particularly aggressive approach to rule revision: In contrast to the limited use of return letters under President Clinton, President Bush’s “OIRA Administrator Graham referred to return letters as the office’s ‘ultimate weapon,’ and viewed them as a way to make clear that the office is serious about the review process.”<sup>172</sup> “OIRA during the George W. Bush Administration . . . returned to the role it had during the Reagan Administration, even describing itself in an annual report as the ‘gatekeeper for new rulemakings.’”<sup>173</sup>

President Obama retained the basic scheme, “reaffirm[ing] the principles” and structures of regulatory review and Executive Order 12,866.<sup>174</sup> President Obama’s Executive Order 13,563 directed agencies to apply the “most innovative and least burdensome tools [to] achiev[e their] regulatory ends.”<sup>175</sup> It required agencies to “take into account benefits and costs, both quantitative and qualitative,” using the “best available science.”<sup>176</sup>

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own to ‘reinvent government’ so as to ensure greater attention to results than to processes, has de-emphasized this particular function.”); Pildes & Sunstein, *supra* note 152, at 6.

171. See, e.g., ACKERMAN & HEINZERLING, *supra* note 21, at 195–201, 207–08 (describing the Bush II administration’s antiregulatory actions that were accomplished through OIRA); Alex Acs & Charles M. Cameron, *Does White House Regulatory Review Produce a Chilling Effect and “OIRA Avoidance” in the Agencies?*, 43 PRESIDENTIAL STUD. Q. 443, 447–48 (2013) (“It is demonstrably the case that Republican and Democrat presidents have used OIRA in different ways, as manifest in OIRA’s auditing rates for different agencies. . . . [I]n the first systematic empirical study of OIRA targeting decisions, [we] find that the Bush [II] administration tended to target large economically significant regulations from ‘liberal’ agencies . . . . In contrast, the Clinton and early Obama administrations seemed to eschew ideological targeting; in addition, the early Obama administration focused its reviews almost exclusively on economically significant regulations.”).

172. CURTIS W. COPELAND, CONG. RESEARCH SERV., RL32397, FEDERAL RULEMAKING: THE ROLE OF THE OFFICE OF INFORMATION AND REGULATORY AFFAIRS 19 (2009).

173. *Id.*

174. Exec. Order No. 13,563 § 1(b), 3 C.F.R. § 215 (2012) (“This order is supplemental to and reaffirms the principles, structures, and definitions governing contemporary regulatory review that were established in Executive Order 12866 of September 30, 1993. As stated in that Executive Order and to the extent permitted by law, each agency must, among other things: (1) propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor its regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity); (4) to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt; and (5) identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.”).

175. *Id.* § 1(a), 3 C.F.R. § 215.

176. *Id.* (“Our regulatory system must protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation. It must

Although President Obama's order identified the relevance of qualitative discussions and listed specific issues,<sup>177</sup> it did not fundamentally change RIA practice. The order did not mandate but merely permitted their consideration, stating that agencies "may" discuss qualitatively those "values that are difficult or impossible to quantify."<sup>178</sup> Most importantly, the Obama administration did not significantly change the basic structure of regulatory review, continuing to subject agency rules to OIRA oversight and retaining the structural presumption against regulation; Executive Order 13,563 stated: "[T]o the extent permitted by law, each agency must . . . propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs . . . ."<sup>179</sup>

The process remained highly formal during that administration. Sunstein, who implemented President Obama's order as Administrator of OIRA, even viewed it as heightening the focus on quantification.<sup>180</sup> As Sunstein explained, the order permitted agencies to proceed with regulations "only if the benefits justify the costs and only if the chosen approach maximizes net benefits"<sup>181</sup> while also directing agencies to "use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible."<sup>182</sup> Thus, this "mini-constitution for the regulatory state"<sup>183</sup> placed an "unprecedented emphasis on the importance of quantification."<sup>184</sup> Sunstein described OIRA's oversight as giving "a great deal of attention . . . to the agency's account of costs and benefits, and to its judgment that the benefits justify the costs (to the extent permitted by law)."<sup>185</sup>

In sum, beginning with the Reagan administration and continuing through the Obama administration, presidents of both parties have given substantial oversight power to the OMB, letting its OIRA office serve as gatekeeper enforcing a specific approach to CBA. This approach has emphasized quantification of regulatory costs and benefits. Like President Reagan, subsequent administrations continued to place the burden on agencies to demonstrate a favorable calculus before promulgating new regulations, perpetuating the antiregulatory oversight structure. Despite some variation in application under different administrations, the language used in President Reagan's and each subsequent President's executive orders characterized

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be based on the best available science. . . . It must identify and use the best, most innovative, and least burdensome tools for achieving regulatory ends. It must take into account benefits and costs, both quantitative and qualitative.").

177. *Id.* § 1(c), 3 C.F.R. § 216 ("[E]ach agency may consider (and discuss qualitatively) values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts.").

178. *Id.*

179. *Id.* § 1(b), 3 C.F.R. § 215.

180. Sunstein, *Real World*, *supra* note 27, at 170–71.

181. *Id.* at 170.

182. Exec. Order No. 13,563 § 1(c), 3 C.F.R. § 216; *see* Sunstein, *Real World*, *supra* note 27, at 171.

183. Sunstein, *Real World*, *supra* note 27, at 170.

184. *Id.* at 171.

185. *Id.* at 170.

regulation as an interference with economically beneficial private ordering that must be justified.

The most obvious antiregulatory feature of the system is structural. As Revesz and Livermore recognized, the very prompt for initiating OIRA review further works against regulation because review is triggered by an agency's initiation of regulatory action.<sup>186</sup> OIRA generally does not spur agencies to regulate, only to review and modify efforts to regulate in the first place.<sup>187</sup> Moreover, review seems to work as a "one-way ratchet," reducing the stringency of regulations but not urging agencies to impose new or more protective standards on industry.<sup>188</sup> Indeed, under President Reagan, deregulatory decisions were not even reviewed under CBA principles, only decisions to create new regulations were.<sup>189</sup>

While each successive president may have been wholly persuaded that OIRA-supervised CBA would improve policy outcomes, the continuation of President Reagan's administrative legacy may be explained by the power that the executive branch gains by centralizing review of agency decisions.<sup>190</sup> Regardless of the reason, the executive branch has maintained OIRA supervision and perpetuated CBA's role in administrative decisionmaking since President Reagan's administration.<sup>191</sup> Meanwhile, debates over the merits of CBA and OIRA's murky enforcement role have been recurring themes in administrative law scholarship.<sup>192</sup>

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186. REVESZ & LIVERMORE, *supra* note 141, at 155.

187. *Id.*

188. *Id.* at 153.

189. *Id.*

190. See Wagner, *supra* note 160, at 2032–33 ("President Reagan's . . . Executive Order [12,291] . . . [created an] institutional architecture [that] . . . not only positions the White House, through OIRA, as a gatekeeper focused on making sure presidential policy is appropriately reflected in agency rules, but also empowers OIRA to serve as a presidential command center with few limits on the issues it can address. In fact, . . . the White House becomes ineluctably drawn into the technical details of agency rules. Limiting political branches to 'just the policy,' is not as simple as it sounds." (footnote omitted)).

191. See *supra* notes 165–85 for a discussion of post-Reagan administrations' approaches to OIRA and CBA.

192. See Cass R. Sunstein, *The Office of Information and Regulatory Affairs: Myths and Realities*, 126 HARV. L. REV. 1838, 1838 n.1 (2013) (referring to the "voluminous" literature discussing the merits of OIRA's role in regulatory review); see also REVESZ & LIVERMORE, *supra* note 141, at 9 ("The debate over weighing the costs and benefits of regulation—dubbed *cost-benefit analysis*—has played an important role in shaping regulatory policy for the past quarter-century."); Jennifer Nou, *Agency Self-Insulation Under Presidential Review*, 126 HARV. L. REV. 1755, 1822–24 (2013) (describing commentators on presidential control over agencies as falling into "two camps," one that lauds presidential control as an important check on potential "overzealousness" of captured agencies and the other that perceives of White House oversight as illegitimate). Professor Wendy Wagner provided an overview of critiques addressing OIRA's involvement in rulemaking. See Wagner, *supra* note 160, at 2035–36 ("Justice Elena Kagan, a widely cited proponent of White House review, advocates for even more self-restraint in OIRA's review of technical and science-intensive rules. More specifically, Justice Kagan expresses concern that the exercise of presidential power in agencies' science-intensive rules 'would threaten a kind of impartiality and objectivity in decisionmaking that conduces to both the effectiveness and the legitimacy of the administrative process.' This is

Nonetheless, the practical impact of the executive orders has been to effectively give OIRA the power to veto regulations, to rewrite them, or to prevent them from being proposed, despite explicit statements that the executive orders do not displace an agency's statutory authority.<sup>193</sup> As explained by Sunstein in reflecting on his time as the OIRA Administrator:

OIRA's authority to slow down or even halt regulations—to say no to members of the president's Cabinet—gives the administrator a major role in shaping their content. . . . And if OIRA thinks that a rule—involving, for example, clean water—should not go forward, it is possible that the rule will not see the light of day. . . .

. . . With the support of the president and other high-level officials, it can help move the government in different directions. It can refuse to approve complex or expensive rules.<sup>194</sup>

While OIRA's impetus for restricting or blocking a rule could come from a myriad of internal or external sources, Sunstein explained that “[a]s a general rule, no significant rule can be issued by any of the nation's Cabinet departments—including the Department of Transportation, the Department of Treasury, the Department of State, and the Environmental Protection Agency—unless OIRA says so.”<sup>195</sup> Because it oversees so many different agencies, OIRA has the power to alter a wide range of regulatory initiatives.<sup>196</sup> Moreover, as Jennifer Nou explained, OIRA review stands to play a much greater role in agency oversight than judicial review because it is not constrained by deference doctrines and need not wait for litigants to raise a challenge.<sup>197</sup>

This relatively new form of agency oversight deploys a specific theoretical lens to determine the merits of agency regulations. As evidenced by the language of OMB guidance and executive orders discussed below, this approach treats economic theories as facts.<sup>198</sup> Based on these assumed facts, it burdens regulators

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particularly true, she points out, in determinations that involve input from congressionally required science advisory panels. As a result, Justice Kagan concludes that not only should presidential review ‘operate with an attitude of respect toward agency experts,’ but that ‘these differences [between the expertise of agencies and the White House] counsel hesitation both in acknowledging and asserting presidential authority in areas of administration in which professional knowledge has a particularly significant and needed function.’” (alteration in original) (footnotes omitted) (quoting Elena Kagan, *Presidential Administration*, 114 HARV. L. REV. 2245, 2356–57 (2001))).

193. See PETER M. SHANE, *MADISON'S NIGHTMARE: HOW EXECUTIVE POWER THREATENS AMERICAN DEMOCRACY* 152–53 (2009) (describing the lack of transparency in OIRA oversight); William Funk, *David and Goliath—Taking on OIRA*, 30 J. LAND USE & ENVTL. L. 63, 67 (2014) (discussing OIRA authority to ensure “that certain rules ‘never s[ee] the light of day’” (alteration in original) (quoting SUNSTEIN, SIMPLER, *supra* note 117, at 7)); Lisa Heinzerling, *Inside EPA: A Former Insider's Reflections on the Relationship Between the Obama EPA and the Obama White House*, 31 PACE ENVTL. L. REV. 325, 364–69 (2014) [hereinafter Heinzerling, *Inside EPA*] (discussing the lack of authority, transparency, and accountability of OIRA review).

194. SUNSTEIN, SIMPLER, *supra* note 117, at 3–4.

195. *Id.* at 3.

196. See *id.* (discussing the multiple areas of federal regulation that OIRA controls); Heinzerling, *Inside EPA*, *supra* note 193, at 348–49.

197. Nou, *supra* note 192, at 1758.

198. See *infra* Part II.A for a discussion of the relevant executive orders and OMB guidance.

with a presumption against regulation, favoring the status quo. It also inscribes political and ethical choices into regulatory policymaking under the guise of science by discounting future benefits and specifying rates, presuming against precaution, and generally directing regulators to focus on costs and benefits that occur within the United States.<sup>199</sup>

## II. GATEKEEPING, NUMBERS, AND THE CASE OF MISSING BENEFITS

The multilayered nature of complex environmental systems frequently impedes regulators' ability to calculate the benefit of preserving individual components. Unfortunately, agencies often overlook the benefit of protecting nonmarket goods when these benefits are difficult to quantify or monetize. Despite their social importance, these values become relegated to a virtual zero zone, in which they languish without representation in formalized CBA.<sup>200</sup>

### A. Circular A-4: OIRA's Antiregulatory Guidance

The antiregulatory nature of both the process and philosophy enforced by OIRA are demonstrated in an influential OMB guidance document, Circular A-4.<sup>201</sup> This guidance, developed in 2003 during the Bush II administration, has been treated as authoritative within OIRA.<sup>202</sup> Subsequent administrations, including President Obama's, have continued to rely upon it.<sup>203</sup> Indeed, President Trump's executive order that jettisoned the federal SCC directed future agency analyses to follow this document more closely.<sup>204</sup>

Circular A-4 instructs federal agencies on analysis of proposed regulations.<sup>205</sup> Circular A-4 broadly describes "[r]egulatory analysis" as "a tool regulatory agencies use to anticipate and evaluate the likely consequences of rules."<sup>206</sup> More specifically, it

provides a formal way of organizing the evidence on the key effects—good and bad—of the various alternatives that should be considered in developing regulations. The motivation is to (1) learn if the benefits of an action are likely to justify the costs or (2) discover which of the various possible alternatives would be the most cost-effective.<sup>207</sup>

The Circular describes CBA as "a primary tool used for regulatory analysis" and explains that when "all benefits and costs can be quantified and expressed in

199. See *infra* Part II.A or a discussion of nonscientific factors influencing regulatory policymaking.

200. See Kysar, *Fish Tales*, *supra* note 119, at 208–09; Heinzerling, *Knowing Killing*, *supra* note 123, at 521 (discussing the "mismatch between moral values and economic valuation" when considering the validity of CBA); Hodges, *supra* note 119, at 162–64.

201. See OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8.

202. See Luttrell, *supra* note 121, at 140–41 (discussing the "increasing ascendancy of Circular A-4").

203. See *id.* at 144.

204. See Exec. Order No. 13,783 § 5(c), 82 Fed. Reg. 16,093, 16,096 (Mar. 28, 2017).

205. OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8, at 1–2.

206. *Id.* at 1.

207. *Id.* at 1–2.

monetary units,” it provides “a clear indication of the most efficient alternative.”<sup>208</sup> This information is valuable, according to the document, “even when economic efficiency is not the only or the overriding public policy objective.”<sup>209</sup> However, in the context of OIRA’s role as gatekeeper, economic efficiency can easily become the overriding concern, trumping other policy objectives and statutory goals.

Circular A-4 incorporates patently antiregulatory presumptions. It follows President Clinton’s Executive Order 12,866, directing federal agencies to “promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well being of the American people.”<sup>210</sup> According to the OMB, agencies must therefore demonstrate that a regulation is necessary before recommending it.<sup>211</sup>

In addition to this generally antiregulatory stance, the Circular applies a specific “presumption against certain types of regulatory action,” requiring agencies to meet a “particularly demanding burden of proof . . . to demonstrate the need” for what it identifies as “[e]conomic [r]egulation.”<sup>212</sup> Importantly, this broad category extends beyond obviously economic subjects (such as price controls) to topics that could implicate environmental, health, and safety risks. For example, the presumption against regulation applies to agency rulemaking that attempts to create “mandatory uniform quality standards for goods or services.”<sup>213</sup> The presumption also applies to controls on entry into employment or production, unless the agency shows that these measures are “*indispensable to protect health and safety*” or for management of common property resources.<sup>214</sup> Thus, even when private activity harms health, safety, or public property, agencies seeking to reduce these impacts must not only overcome the general presumption against regulation but also meet a heightened standard, showing that the rule is “indispensable.”<sup>215</sup> These requirements further tip the scales against regulation.

In addition to reinforcing the antiregulatory stance of the executive orders, this purportedly technical guidance document hides political and ethical judgments under the guise of administrative process. Several of these hidden policy decisions have particular importance for climate policy. For example, Circular A-4 directs agencies to “focus on benefits and costs that accrue to citizens and residents of the United States,”<sup>216</sup> a prescription that nonchalantly embeds an ethical choice that dismisses extraterritorial duties. As a practical

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208. *Id.* at 2.

209. *Id.*

210. *Id.* at 3–4 (quoting Exec. Order No. 12,866 § 1(a), 3 C.F.R. §§ 638–639 (1994)).

211. *Id.* at 3.

212. *Id.* at 6.

213. *Id.* at 7.

214. *Id.* (emphasis added).

215. *Id.*

216. *Id.* at 15.

matter, it also overlooks the interdependence of international economic activities and their impacts. This unexplained direction has served as a basis for challenging the federal SCC's analysis of global impacts, a choice that (as its authors reasonably explained) responds to the global nature of climate change.<sup>217</sup>

Regarding uncertain costs and benefits, the Circular directs agencies to identify probabilities wherever possible while incorporating a rule against precaution. The agency should avoid "conservative assumptions and defaults (whether motivated by science policy or by precautionary instincts), [because these] will be incompatible with benefit analyses as they will result in benefit estimates that exceed the expected value."<sup>218</sup> Here the Circular appears to indeed earn its name, engaging in circular reasoning by categorizing "conservative assumptions" as necessarily creating results that exceed expected value.<sup>219</sup> This is particularly silly given that "expected value" does not exist in the world but merely results from the analytical methods employed in conducting CBA.<sup>220</sup>

Despite ethical controversy over the morality of discounting the value of future benefits and technical disputes over the selection of a specific rate,<sup>221</sup> Circular A-4 instructs agencies to discount future benefits and provides presumptive rates.<sup>222</sup> Although it acknowledges controversy over this treatment of future lives and nonmarket environmental goods, the Circular nonetheless directs agencies to discount future benefits because "the resources that would have been used to save those lives can be invested to earn a higher payoff in future lives saved."<sup>223</sup> Yet this statement represents an economic theory, not a factual premise. There is simply no guarantee that saved resources will be invested beneficially rather than being used in a manner that exacerbates pollution problems or creates additional safety risks. Indeed, because nothing restricts how companies use savings from regulations that were not imposed,

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217. See IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 35, at 10–11.

218. OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8, at 40.

219. *See id.*

220. *See id.* at 10, 40; McGarity, *A Cost-Benefit State*, *supra* note 21, at 15–16.

221. See McGarity, *Regulatory Analysis and Regulatory Reform*, *supra* note 86, at 1295–96 ("The correct rate of discounting benefits, however, is more controversial. Many health and environmental regulations are intended to benefit future generations. Using a high discount rate in strict cost-benefit analysis biases the analysis against future benefits. Thus, some have suggested that it may be inappropriate to discount future benefits at all, because future generations may value health and environmental amenities even more than today's population." (footnotes omitted)).

222. OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8, at 31, 34, 36 ("Benefits and costs do not always take place in the same time period. When they do not, it is incorrect simply to add all of the expected net benefits or costs without taking account of when they actually occur. If benefits or costs are delayed or otherwise separated in time from each other, the difference in timing should be reflected in your analysis. . . . For regulatory analysis, you should provide estimates of net benefits using both 3 percent and 7 percent. . . . If your rule will have important intergenerational benefits or costs you might consider a further sensitivity analysis using a lower but positive discount rate in addition to calculating net benefits using discount rates of 3 and 7 percent.").

223. *Id.* at 34.



these resources could all be funneled to executive bonuses later spent on liquor or candy.

Moreover, the specific rates prescribed, both 3 and 7%,<sup>224</sup> have no factual grounding and indeed have been criticized by economists.<sup>225</sup> Among other reasons, the fact that investment returns depend upon broader market trends, and hence prove to be variable, renders irrational the insistence on static numbers that the OMB developed fifteen years ago.<sup>226</sup> These numbers seem particularly out of date in light of the major recession in the last decade and recent market volatility.<sup>227</sup>

#### B. *Relegating Benefits to the Zero Zone: Irrational Omissions*

While Circular A-4 acknowledges that some values may be difficult to quantify and directs agencies to discuss these qualitatively, it nonetheless emphasizes monetization of costs and benefits. The OMB instructs agencies to monetize quantitative estimates wherever possible.<sup>228</sup> Although the methodological details and the broader ethics of monetizing nonmarket goods are controversial, the guidance document directs agencies to employ economic techniques (such as revealed preference through economic surrogates and stated preferences through surveys)<sup>229</sup> that purport to capture the value of nonmarket goods.<sup>230</sup> In addition to covering a range of effects, the OMB favors willingness to pay because it “allows [an agency] to directly compare [its] results to the other benefits and costs in [its] analysis.”<sup>231</sup> The OMB “expect[s] [agencies] to provide a benefit-cost analysis of major health and safety rulemakings” because CBAs provide useful insight into “what the public is willing to pay for improvements in health and safety.”<sup>232</sup>

224. *Id.* at 33–34.

225. *See generally* Cass R. Sunstein, *On Not Revisiting Official Discount Rates: Institutional Inertia and the Social Cost of Carbon*, 104 AM. ECON. REV. 547 (2014) (discussing the widely held perception that prescribed rates have become outdated and laying out the process required to reevaluate them).

226. Heinzerling, *Discounting Our Future*, *supra* note 126, at 60 (noting that “[e]stimates of market rates of return themselves vary considerably”).

227. *See* Scott Gamm, *Bob Doll on Market Volatility: ‘I Want More Panic,’* YAHOO FINANCE (Nov. 21, 2018), <http://finance.yahoo.com/news/bob-doll-market-volatility-want-panic-195559293.html> [<http://perma.cc/Z4V2-WNVW>]; Nick Mathiason, *Three Weeks That Changed the World*, GUARDIAN (London) (Dec. 27, 2008), <http://www.theguardian.com/business/2008/dec/28/markets-credit-crunch-banking-2008> [<http://perma.cc/98J6-5HD5>]; Robert Rich, *The Great Recession: December 2007 to June 2009*, FED. RES. HIST. (Nov. 22, 2013), [http://www.federalreservehistory.org/essays/great\\_recession\\_of\\_200709](http://www.federalreservehistory.org/essays/great_recession_of_200709) [<http://perma.cc/7GQ5-VKBZ>] (describing the economic downturn between December 2007 and June 2009 as “the longest since World War II”).

228. OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8, at 27.

229. *Id.* at 26–28.

230. *See id.* at 19 (“Estimating benefits and costs when market prices are hard to measure or do not exist is more difficult. In these cases, you need to develop appropriate proxies that simulate market exchange.”)

231. *Id.*

232. *Id.* at 28.

As a consequence of OIRA's influence combined with its emphasis on quantification, agencies often implicitly value unmonetizable or unmonetized benefits at zero.<sup>233</sup> This will chill regulatory proposals that may not appear to be cost justified. Yet even when agencies sufficiently demonstrate positive net benefits to justify promulgating a new regulation, omitted benefits will cause underregulation when agencies use CBA to set permissible levels of harm, such as in numeric pollution limits.<sup>234</sup> This zero valuation is not mandated by executive orders and indeed conflicts with the theoretical descriptions of CBA proffered by its proponents.<sup>235</sup> Nonetheless, RIAs approved by OIRA have given values of zero to nontrivial environmental benefits.<sup>236</sup>

One response to this problem has been to propose government funding to aid development of better modeling tools to facilitate quantification.<sup>237</sup> Alternately, Sunstein has urged agencies to include a "breakeven analysis" that states how much an unquantified benefit would need to be worth to outweigh costs.<sup>238</sup> Jonathan Masur and Eric Posner have argued that more benefits could

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233. See Letter from Joel Beauvais, Assoc. Adm'r, U.S. EPA, to Alfredo Gomez, Acting Dir., Nat. Res. & Env't, U.S. Gov't Accountability Office (July 9, 2014), in GAO-14-519, ENVIRONMENTAL REGULATION: EPA SHOULD IMPROVE ADHERENCE TO GUIDANCE FOR SELECTED ELEMENTS OF REGULATORY IMPACT ANALYSES 44, 45 (2014) ("GAO's report concludes that failure to monetize some benefits in certain RIAs makes it more difficult for the public to fully understand economic trade-offs. The EPA agrees that there are challenges in completely monetizing both benefits and costs; in particular, the EPA is often unable to quantify or monetize all of the public health and environmental benefits of its regulations, including some potentially important effects. However, the report does not fully acknowledge that this is a broad problem in benefit-cost analysis which is not unique to the EPA . . . ."); see also David Driesen, *Cost-Benefit Analysis and the Precautionary Principle: Can They Be Reconciled?*, 2013 MICH. ST. L. REV. 771, 778 [hereinafter Driesen, *Cost-Benefit Analysis and Precaution*] ("As a result of th[e] frequent inability to quantify qualitatively well-understood impacts, the CBA calculations used to formulate environmental policies simply leave out information about important abatement benefits."); Hodges, *supra* note 119, at 161-64, 175.

234. See, e.g., Kysar, *Politics By Other Meanings*, *supra* note 37, at 70-71 (discussing EPA and NHTSA's benefit estimates for fuel efficiency and GHG standards for model year 2014-2018 heavy duty trucks and buses that showed \$41 billion in net benefits despite failing to quantify many human health benefits of reduced emissions).

235. See, e.g., Hahn, *supra* note 21, at 1049-50 (arguing that CBA "does not require that costs and benefits be expressed in the same units or that agencies monetize benefits that may not be quantifiable" and further contending that CBA should "be careful to reflect those uncertainties and account for qualitative factors"). But see Driesen, *Cost-Benefit Analysis and Precaution*, *supra* note 233, at 778 ("CBA supporters recognize that important nonquantifiable benefits exist and say that policymakers should consider nonquantifiable benefits, but they have been silent about how policymakers should do this. And no evidence exists that OIRA, CBA's principal advocate within the federal government, has followed academic advice to give weight to nonquantifiable benefits, even when the nonquantifiable benefits matter much more than the quantifiable ones." (footnote omitted)).

236. See Kysar, *Fish Tales*, *supra* note 119, at 208-09; Hodges, *supra* note 119, at 162-64, 175.

237. Richard L. Revesz, *Quantifying Regulatory Benefits*, 102 CALIF. L. REV. 1423, 1456 (2014) ("The best approach is to actually quantify the benefit. . . . The categories of quantified and nonquantified benefits are not immutable. Instead, they are highly permeable. But the shift from nonquantified to quantified status is not a random one. Instead, it is highly dependent on the government's role as a funder of private research and as a direct participant in the quantification process.").

238. Cass R. Sunstein, *The Limits of Quantification*, 102 CALIF. L. REV. 1369, 1393 (2014)

be meaningfully included if regulators used their experience and expertise to generate “best estimates” for the analysis.<sup>239</sup> Over time these rough projections could be improved by having regulators compare their estimates to actual implementation data after a new rule’s adoption.<sup>240</sup> While these approaches could improve analysis for some types of regulations, they prove far less useful when multiple benefits cannot be quantified.<sup>241</sup> Some things may just not be captured well numerically, particularly when they involve highly complex, interdynamic systems.<sup>242</sup> Given that CBA functions not only as an on-off approval switch for regulations but also a technique for setting regulatory stringency along a spectrum of options, monetized benefits prove overly influential even when a rule can “pass” basic CBA without the monetization of all benefits.<sup>243</sup>

Assumptions behind formal CBA help to explain (but not to justify) the zero assumption. As Douglas Kysar explained, this process “carries an implicit assumption that the policy space in which EPA operates is informationally rich and probabilistically sophisticated, such that the agency easily can identify courses of action that maximize expected social welfare outcomes.”<sup>244</sup> Because agencies, in fact, do not operate in such an informationally rich and analytically sophisticated environment, they focus on benefits with available (or accessible) data that can be calculated against regulatory stringency.<sup>245</sup> For example, as discussed in *Entergy Corp. v. Riverkeeper, Inc.*,<sup>246</sup> the EPA’s benefits analysis for regulations governing power plant cooling water intakes considered the value of reducing harm only to commercially useful fish, entirely ignoring impacts to other species; existing markets made monetization of commercial species’ loss much easier than for noncommercial species.<sup>247</sup> In addition, the market also made it much easier to predict the quantity of commercial fish that would be affected by the rule.<sup>248</sup> The EPA acknowledged that this left substantial benefits unmonetized, remarking that because it could not monetize the value for many

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[hereinafter Sunstein, *Limits of Quantification*].

239. Masur & Posner, *Unquantified Benefits*, *supra* note 85, at 119–21.

240. *Id.*

241. See Revesz, *supra* note 237, at 1430.

242. See, e.g., KYSAR, REGULATING FROM NOWHERE *supra* note 21, at 74 (“Because complex adaptive systems contain ineliminable uncertainties . . . , such systems by their nature are likely to present ill-posed problems, that is, problems whose imperviousness to resolution is driven not by deficiencies in our epistemic position, but rather by features inherent to the problems themselves.”).

243. See Kysar, *Fish Tales*, *supra* note 119, at 195–96; see also KYSAR, REGULATING FROM NOWHERE, *supra* note 21, at 88 (describing how the U.S. Army Corps of Engineers’ CBA for the ill-fated New Orleans levees focused on property values rather than lifesaving benefits and consequently understated the value of hurricane protection).

244. Kysar, *Fish Tales*, *supra* note 119, at 195.

245. *Id.* at 196; see also KYSAR, REGULATING FROM NOWHERE, *supra* note 21, at 88 (“Because they could not measure what is important, they made important what they could measure.”)

246. 556 U.S. 208 (2009).

247. *Entergy*, 556 U.S. at 238 (Stevens, J., dissenting).

248. See Sinden, *Formality and Informality*, *supra* note 84, at 154–56 (describing the EPA’s CBA analysis at issue in *Riverkeeper*).

species losses, its baseline estimates reflected the “losses associated with less than 2%” of the fish that would be killed by the intake structure.<sup>249</sup> The EPA simply omitted valuation of a broad range of potential benefits from the rule, including not only avoided harm to noncommercial species but also biodiversity preservation and human recreational uses.<sup>250</sup> While it did discuss these benefits qualitatively, the EPA nonetheless used only the monetized values to determine the regulation’s level of stringency, an approach validated by the Court.<sup>251</sup>

Despite generally acknowledging the potential for RIA to overlook unmonetized benefits, former OIRA Administrator under George W. Bush, John Graham, has argued that unmonetized benefits can be captured effectively in qualitative analysis.<sup>252</sup> He has contended that critics misunderstand OIRA’s practices and has claimed that OIRA applies a “soft” approach to CBA, requiring regulators to show only that benefits “justify” costs rather than “exceed[]” costs.<sup>253</sup> According to Graham the “hard” approach to CBA has few supporters among academics or practitioners and “the ‘soft’ version of the benefit-cost test has been applied by the OMB and the regulatory agencies since 1993.”<sup>254</sup> However, his sources tell a different story.

Referring to OIRA’s data on regulatory benefits (beginning with the point when OMB started keeping sufficient records), Graham reported that from 1992 to 2006 the “total benefits of major rules . . . exceeded the total costs by more than 300%.”<sup>255</sup> Moreover, during his tenure from 2001 to 2006, the average annual rate of net benefits was more than double that of the prior eight years.<sup>256</sup> Yet if unmonetized benefits considered qualitatively were indeed taken sufficiently seriously to justify imposing monetized costs that “exceed” monetized benefits, would the balance sheet have had such a favorable numeric ratio? This seems unlikely, unless a few highly cost-beneficial regulations shifted the average. But this was not the case. A more detailed look at the source Graham cited, OIRA’s *Draft 2007 Report to Congress on the Costs and Benefits of Federal Regulations*, reveals that every major regulation listed in the report shows monetized benefits that exceed monetized costs.<sup>257</sup> This makes OIRA’s practice look very much like “hard” CBA.

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249. See EPA, EPA-821-R-04-005, ECONOMIC AND BENEFITS ANALYSIS FOR THE PROPOSED SECTION 316(B) PHASE II EXISTING FACILITIES RULE, at C2-2 (2004) (“EPA estimated non-use benefits only qualitatively. As a result, the Agency was not able to directly monetize the value of losses for 98.2% of the age-one equivalent losses of all commercial, recreational, and forage species . . . . This means that the estimates of baseline losses presented in this section represent the losses associated with less than 2% of the total age-one equivalents lost due to impingement and entrainment by cooling water intake structures (CWISs) and should be interpreted with caution.”).

250. See *id.*; see also Kysar, *Fish Tales*, *supra* note 119, at 196.

251. *Entergy*, 556 U.S. at 235 (Breyer, J., concurring).

252. See John D. Graham, *Saving Lives Through Administrative Law and Economics*, 157 U. PA. L. REV. 395, 488–90 (2008).

253. See *id.* at 432–38.

254. *Id.* at 432, 437.

255. *Id.* at 482.

256. *Id.* at 403, 482.

257. See OFFICE OF MGMT. & BUDGET, DRAFT 2007 REPORT TO CONGRESS ON THE COSTS AND

Graham did not disclose how many regulations simply did not even make it to the final stage because the agency could not produce the right numbers.<sup>258</sup> Thus the extent of OIRA's chilling effect on regulation remains unclear, although it no doubt has this effect to some degree. Even with finalized rulemaking, failure to incorporate unmonetized benefits will produce underregulation (by CBA's own logic) when an agency selects a permissive risk level among a spectrum of options.

Finalized regulations that have implicitly employed a zero placeholder for important benefits have survived OIRA review.<sup>259</sup> Hence, it appears that OIRA has accepted benefit analyses that ignored difficult to monetize impacts in the service of the quantification imperative.<sup>260</sup>

### C. Center for Biological Diversity v. NHTSA: *Catalyst for the Federal SCC*

In *Center for Biological Diversity v. National Highway Traffic Safety Administration*, the Ninth Circuit rejected the National Highway Traffic Safety Administration's (NHTSA's) implicit reliance on a zero placeholder for the climate change benefits of reduced emissions, a decision that catalyzed development of the federal SCC.<sup>261</sup> The arguments made by NHTSA, discussed in the following paragraphs, illustrate how agency decisions can be irrationally blind to unmonetized impacts. While the Ninth Circuit's decision corrects for the omission in this specific case due to the availability of proposed values, the failure of the court, as described below, to address the broader systemic dysfunction suggests the entrenchment of formalized CBA.

The Ninth Circuit remanded NHTSA's corporate average fuel economy standards<sup>262</sup> for model year 2008–2011 light trucks because, among other things, the CBA arbitrarily and capriciously valued GHG reductions at zero.<sup>263</sup> Despite deferring to NHTSA's decision to use marginal CBA to assess “economic feasibility,”<sup>264</sup> a statutorily prescribed factor for setting the fuel economy

BENEFITS OF FEDERAL REGULATIONS 33–36 (2007) [hereinafter OFFICE OF MGMT. & BUDGET, DRAFT 2007 REPORT].

258. See Graham, *supra* note 252, at 481–82 (discussing the number of final rules that cleared OIRA analysis while failing to discuss rules that did not make it to this final stage).

259. See *supra* notes 244–51 and accompanying text for an example of an EPA regulation that used a zero placeholder for an avoided harm yet survived OIRA review.

260. See OFFICE OF MGMT. & BUDGET, DRAFT 2007 REPORT, *supra* note 257, at 7.

261. *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1181–82 (9th Cir. 2008).

262. Pursuant to the Energy Policy and Conservation Act of 1975 (EPCA), NHTSA must establish automobile fuel economy standards. See Energy Policy and Conservation Act of 1975, Pub. L. No. 94-163, sec. 301, § 502(a)(5)(b), 89 Stat. 871, 903 (current version at 49 U.S.C. § 32902). A corporate average fuel economy standard (“CAFE standard”) is “a performance standard specifying a minimum level of average fuel economy applicable to a manufacturer in a model year.” See 49 U.S.C. § 32901(a)(6) (2018).

263. See *Ctr. for Biological Diversity*, 538 F.3d at 1181–82 (“We hold that the Final Rule is arbitrary and capricious, contrary to the EPCA in its failure to monetize the value of carbon emissions . . .”).

264. *Id.* at 1191, 1197 (“We agree with NHTSA that ‘EPCA neither requires nor prohibits the

standard,<sup>265</sup> the court found that failure to include the benefits of GHG reductions distorted the analysis:

Even if NHTSA may use a cost-benefit analysis to determine the “maximum feasible” fuel economy standard, it cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards. NHTSA fails to include in its analysis the benefit of carbon emissions reduction in either quantitative or qualitative form.<sup>266</sup>

Indeed, NHTSA’s analysis typified the practice of ignoring unquantified benefits, as it candidly acknowledged when it claimed that benefits were too uncertain (rather than nonexistent) to include in the cost-benefit balancing analysis that it used to set minimum fuel efficiency standards. Thus, in response to comments, NHTSA stated that it “continues to view the value of reducing emissions of CO<sub>2</sub> and other greenhouse gases as too uncertain to support their explicit valuation and inclusion among the savings in environmental externalities from reducing gasoline production and use.”<sup>267</sup> Although it could not calculate these critical benefits, the agency nonetheless “determined the stringency of that standard *on the basis of monetized net benefits*.”<sup>268</sup>

The court rejected claims that climate change benefits were too uncertain to include in the RIA because NHTSA had monetized other uncertain benefits.<sup>269</sup> Noting the similarity between figures proposed by the National Academy of Sciences and others, it also dismissed NHTSA’s excuse that the range of proposed values was too wide to be meaningfully applied.<sup>270</sup> Finally, it rejected NHTSA’s claim that calculations of specific mitigation measures’ costs (such as

setting of standards at the level at which net benefits are maximized.” (quoting Average Fuel Economy Standards for Light Trucks; Model Years 2008–2011, 70 Fed. Reg. 51,414, 51,435 (Aug. 30, 2005) (codified at 49 C.F.R. §§ 523, 533, 537 (2018)))).

265. See 49 U.S.C. § 32902(a), (c), (f); *Ctr. for Biological Diversity*, 538 F.3d at 1182–83.

266. *Ctr. for Biological Diversity*, 538 F.3d at 1198. The court noted that, despite omitting these benefits, NHTSA “did . . . include an analysis of the employment and sales impacts of more stringent standards on manufacturers.” *Id.*

267. *Id.* at 1200 (quoting the agency’s response to comments).

268. *Id.* (emphasis added) (quoting the agency’s response to comments).

269. *Id.* at 1202 (“NHTSA’s reasoning is arbitrary and capricious because it has monetized other uncertain benefits, such as the reduction of criteria pollutants, crash, noise, and congestion costs, and ‘the value of increased energy security.’ Dr. Michael Wang of the Center for Transportation Research at Argonne National Laboratory stated in his peer review of the CAFE compliance and effect model used by NHTSA in its rulemaking that the wide range of dollar values per ton of CO<sub>2</sub> ‘is not a good reason that CO[2] dollar values are not included . . . . The same can be said [of] dollar values for criteria pollutants. Yet, monetary values for criteria pollutant emissions are included in the model.” (alteration in original) (omissions in original) (footnote omitted) (citations omitted) (first quoting Average Fuel Economy Standards for Light Trucks; Model Years 2008–2011; Final Rule, 71 Fed. Reg. at 17,592; and then quoting Michael Wang, Comment Letter on Average Fuel Economy Standards for Light Trucks; Model Years 2008–2011 (July 29, 2005), <http://www.regulations.gov/contentStreamer?documentId=NHTSA-2005-22223-0007&attachmentNumber=1&contentType=pdf> [<http://perma.cc/8U3X-D5NE>])).

270. *Id.* at 1200–01 (“NHTSA gave no reasons why it believed the range of values presented to it was ‘extremely wide’; in fact, several commenters and the NAS committee recommended the *same* value: \$50 per ton carbon.”).

sequestration) presented insurmountable difficulties, noting that these calculations were unnecessary.<sup>271</sup>

Despite emphatically stating that “the value of carbon emissions reduction is certainly not zero,”<sup>272</sup> the court did not broadly confront the analytical distortion created by omitting difficult-to-quantify benefits from RIAs. Rather, it found NHTSA’s omission to be arbitrary and capricious because multiple lines of evidence demonstrated the availability of valuation methods.<sup>273</sup> Because the court found monetization to be possible, its decision does not provide guidance on how to incorporate qualitatively assessed benefits into RIA. In fact, the decision emphasized quantification as OMB’s preferred practice: “[G]uidance from the Office of Management and Budget [Circular A-4] provides that agencies are to monetize costs and benefits whenever possible.”<sup>274</sup>

Notably, NHTSA failed to comprehend the broader implications of excluding difficult to quantify benefits; in an approach rejected by the court, the agency framed the refusal to consider “uncertain” benefits as distinct from valuing them at zero:

NHTSA insisted at argument that it placed no value on carbon emissions reduction rather than zero value. We fail to see the difference. The value of carbon emissions reduction is nowhere accounted for in the agency’s analysis, whether quantitatively or qualitatively. This position also contradicts NHTSA’s own explanation in the Final Rule that “the agency determined the stringency of [the] standard *on the basis of monetized net benefits.*” . . . .

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271. *Id.* at 1201 (“NHTSA argues that the problem was not simply ‘the ultimate value to be assigned, but the wide variation in published estimates of the three major underlying costs of carbon dioxide emissions—the cost of damages caused by such emissions, the costs of avoiding or controlling such emissions, and the costs of sequestering resulting emissions.’ But NHTSA fails to explain why those three ‘underlying costs’ are relevant to the question of how carbon emissions should be valued. We are convinced by Petitioners’ response: ‘To monetize the benefits of reducing CO2 emissions from automobiles, NHTSA did not need to calculate the “costs of sequestering emissions.” Carbon capture and sequestration, though a feasible means of reducing emissions from large stationary sources such as coal-fired power plants, was not within the range of actions at issue in this automobile fuel economy rulemaking. Nor were “costs for controlling or avoiding [CO2] emissions” a genuine methodological barrier here: NHTSA already performed an elaborate analysis of the costs of mandating increases in fuel economy. For purposes of this rulemaking, that was the relevant category of control costs.’” (alteration in original) (citation omitted) (first quoting Brief for Respondents at 49, *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172 (9th Cir. 2008) (Nos. 06–71891, 06–72317, 06–72641, 06–72694, 06–73807, 06–73826); and then quoting Brief for Petitioner at 10–11, *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172 (9th Cir. 2008) (Nos. 06–71891, 06–72317, 06–72641, 06–72694, 06–73807, 06–73826))).

272. *Id.* at 1200.

273. *See id.* at 1200–02. The availability of valuation methods was demonstrated by numerous comments on the proposed rule, the sizeable academic literature on valuation, guidance for the National Academy of Sciences, and NHTSA’s acknowledgement of these methods. *Id.* As the court explained, “NHTSA conceded [that climate benefits were greater than zero] during oral argument when, in response to questioning, counsel for NHTSA admitted that the range of values begins at \$3 per ton carbon.” *Id.* at 1200.

274. *Id.* at 1200 n.48.

. . . [T]here is no evidence to support NHTSA's conclusion that the appropriate course was not to monetize or quantify the value of carbon emissions reduction at all.<sup>275</sup>

Although neither successful nor logical, NHTSA's attempt to distinguish zero valuation from nonvaluation reflects an implicit assumption in formalized CBA. Although its proponents could not (and would not) justify replacing a known positive benefit value with zero, the practice of formalized CBA effectively does the equivalent; it replaces positive values with zeros simply because the values are unknown or extremely difficult to quantify.<sup>276</sup>

Using a zero equivalent (either through omission or through underappreciation of qualitatively discussed benefits) to represent uncertain benefits creates the same decision-making distortion that would occur if an analysis replaced a known positive value with a zero. The irrationality of the ultimate decision is the same; only the ability to perform the precedent calculation differs. Particularly when combined with a presumption against regulation, the failure to capture uncertain benefits undermines effective policymaking.

With climate change policymaking, complex ecosystem interactions and difficult-to-quantify benefits heighten the potential for this omission to adversely affect decisionmaking. Climate change regulation renders valuation particularly challenging due to incomplete information, long time horizons, and global causes and effects.<sup>277</sup>

### III. STANDARDIZING THE FEDERAL SOCIAL COST OF CARBON

This Section first describes the process of developing the federal SCC in response to the Ninth Circuit's decision in *Center for Biological Diversity v. NHTSA*. It then argues that, despite substantially improving over analyses such as NHTSA's that omitted climate benefits, incorporation of the federal SCC into CBA nonetheless ultimately undermines long-term climate change policy for several reasons. First, despite the acknowledged limitations and caveats, by providing a specific range of numbers, the federal SCC creates a false sense of precision and predictability about climate change impacts. Second, by treating current resource distributions as baseline conditions, it ignores policies that gave fossil fuels substantial market advantages while entrenching their place in the U.S. energy system. Third, as part of a formalized analytical methodology that favors status quo arrangements, the process perpetuates broader dysfunction in administration that presumes against regulation. This presumption perpetuates systemic inertia. Finally, by quantifying market impacts far into the future, the analysis implies that markets will continue to function despite substantial disruption to natural systems. This implication obscures the dependence of modern economies on relatively stable climatic and environmental conditions.

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275. *Id.* at 1200–01.

276. See *supra* Part II.B for a discussion of this problem.

277. See Farber, *Coping with Uncertainty*, *supra* note 132, at 1690–96.



The presentation of this analysis in numeric form also creates an illusion that humans can understand and control the effects of climate change.

A. *The Interagency Working Group's Methodology*

The OMB convened an interagency working group (IWG) in 2009 to develop the federal SCC to represent numerically the value of avoiding the harms from climate change.<sup>278</sup> The group aimed to create a common metric for the federal SCC, representing the “net effects (comprising both positive and negative effects) of CO<sub>2</sub> emissions.”<sup>279</sup> The IWG developed the federal SCC in part to respond to the Ninth Circuit’s *Center for Biological Diversity* decision by providing NHTSA and other agencies with numeric representations of climate benefits to apply in regulatory CBAs so that these benefits would not be overlooked.<sup>280</sup> The federal SCC also aimed to coordinate efforts of those agencies that had already attempted to calculate a social cost of carbon for rulemaking by bringing consistency to what had been a divergent set of values used in different agencies.<sup>281</sup>

Before the IWG convened, a number of researchers had already proposed various methods for monetizing climate change impacts, making available a substantial literature discussing various approaches and offering a range of values to represent the social cost of carbon.<sup>282</sup> The IWG selected the average of estimates from three well-known integrated assessment models (IAMs) created by outside researchers.<sup>283</sup> These IAMs attempt to calculate a social cost of carbon by synthesizing wide-ranging scientific and economic information to predict how changes in CO<sub>2</sub> emissions will interact with the economy.<sup>284</sup> The resulting monetary figures purport to represent the value of avoided climate

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278. IWG, RESPONSE TO COMMENTS, *supra* note 5, at 3.

279. *Id.*

280. *Id.*

281. *See id.*

282. For authors debating the merits of specific integrated assessment models, see, for example, NORDHAUS, A QUESTION OF BALANCE, *supra* note 88 (describing his general price-based approach to determining optimal climate change policy and the DICE integrated assessment model); NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW (2007) (discussing an integrated assessment model that favors early, ambitious climate reductions); William D. Nordhaus, *A Review of the Stern Review on the Economics of Climate Change*, 45 J. ECON. LITERATURE 686 (2007) [hereinafter Nordhaus, *A Review of the Stern Review*] (book review) (critiquing Stern); Richard S.J. Tol, *The Marginal Damage Costs of Carbon Dioxide Emissions: An Assessment of the Uncertainties*, 33 ENERGY POL'Y 2064 (2005) (discussing the FUND integrated assessment model originally developed by Tol); Richard S.J. Tol & Gary W. Yohe, *A Review of the Stern Review*, WORLD ECON., Oct.–Dec. 2006, at 233 (critiquing Stern). Some of this literature discusses the broader policy issue of whether or not the United States should seek to mitigate climate change at all; that is, whether the benefits exceeded the costs sufficiently to make GHG reductions in the national interest. *See, e.g.*, Jody Freeman & Andrew Guzman, *Climate Change and U.S. Interests*, 41 ENVTL. L. REP. NEWS & ANALYSIS 10695, 10695 (2011) (rejecting the “climate change winner” argument).

283. IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 35, at 5.

284. *Id.* at 6–8.

harm by monetizing the present and future damage caused by an additional ton of carbon dioxide emissions emitted now.<sup>285</sup>

The IWG released initial interim estimates in 2009, which included a range of values from \$5 to \$55 per ton of carbon dioxide.<sup>286</sup> This was followed by a revised version in February 2010 that incorporated public comment and new technical information to produce a range of four values from \$5 to \$65 (in 2007 dollars).<sup>287</sup> Updated federal SCC estimates came out in 2013 and 2015 that showed slightly higher values based on updates to the underlying IAMs.<sup>288</sup> The IWG's federal SCC provided a range of values, rather than a single figure, as a way to express two things numerically: (1) ethical controversy over discounting future benefits and (2) unsettled scientific debate over the extent of future impacts.<sup>289</sup> To determine the specific values, the IWG engaged in a multi-step process. It first averaged social cost of carbon values produced by the selected IAMs and then applied three alternative discount rates to the average to produce the three lower values in the federal SCC's four number range.<sup>290</sup> The IWG designed the highest of the four numbers to reflect the possibility that harm may be worse than predicted: a potential monetized by a value representing the ninety-fifth percentile of the three IAMs with a three percent discount rate.<sup>291</sup>

Although most recognized the enormity of the IWG's task, critics challenged the methodology used to develop the federal SCC, including the validity of the underlying IAMs.<sup>292</sup> Daniel Farber, for example, identified substantial areas of uncertainty in the IAMs' analysis.<sup>293</sup> While recognizing that the models reflect a great deal of effort and expertise as the modelers' "best professional judgment," he highlighted the "disconnect" between their

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285. See Nordhaus, *A Review of the Stern Review*, *supra* note 282, at 698.

286. IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 35, at 4.

287. See IWG, RESPONSE TO COMMENTS, *supra* note 5, at 3–4 (“In February 2010, after considering public comments on the interim values and conducting additional technical work, the IWG released improved SCC estimates.”); IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 5, at 3–4.

288. INTERAGENCY WORKING GRP. ON SOC. COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866, at 2–3 (2015) [hereinafter IWG, 2015 TECHNICAL SUPPORT DOCUMENT]. From the beginning of its work the IWG presumed that periodic updates would be necessary to incorporate evolving science. IWG, RESPONSE TO COMMENTS, *supra* note 5, at 41.

289. IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 35, at 23–28.

290. *Id.* at 25–26.

291. *Id.* at 25. The IWG analyses showed each of these four values increasing over time “because future emissions are expected to produce larger incremental damages as physical and economic systems become more stressed.” IWG, 2015 TECHNICAL SUPPORT DOCUMENT, *supra* note 288, at 16.

292. See, e.g., Jonathan S. Masur & Eric A. Posner, *Climate Regulation and the Limits of Cost-Benefit Analysis*, 99 CALIF. L. REV. 1557, 1581 (2011) [hereinafter Masur & Posner, *The Limits of Cost-Benefit Analysis*] (citing fundamental technical inadequacies in the IAMs relied upon by the IWG including “weakly defended” initial parameters regarding projected growth and technological development and unjustified assumptions that humans can adapt at low cost).

293. See Farber, *Coping with Uncertainty*, *supra* note 132, at 1701–03.

acknowledged reservations about the analyses and their confidence in conclusions.<sup>294</sup> He argued that the IAMs' outputs would be best understood as "tentative estimates."<sup>295</sup> Some commentators highlighted the overly optimistic baseline assumptions used in the IAMs that presumed aggressive climate change mitigation policies would be enacted and thus understated future impacts.<sup>296</sup>

Scholars emphasized the methodological difficulties of monetizing both costs and benefits given uncertain science and the potential for catastrophic harms.<sup>297</sup> Jonathan Masur and Eric Posner raised concerns over flaws in the underlying IAMs used to calculate the federal SCC, particularly the IAMs' limited or nonexistent consideration of catastrophic harms.<sup>298</sup> The IWG compounded these problems by assuming "a linear relationship between benefits and reductions in emissions" when, in fact, "[t]he relationship between the amount of carbon emitted into the atmosphere and the warming it causes could well be quadratic, cubic, or even exponential."<sup>299</sup> Given this potential, the impact of warming on the economy could also be nonlinear.<sup>300</sup>

Selection of the discount rate received criticism from both ends; conservative critics challenged the selection of discount rates lower than those provided by Circular A-4,<sup>301</sup> while other commentators either argued that the rate was too high or categorically objected to intergenerational discounting as unethical.<sup>302</sup>

These are not idle concerns. Despite being raised from initial levels, the numbers still likely understate benefits (presuming they are even calculable) because of knowledge gaps, difficult calculation problems, and the models' inability to incorporate tipping points.<sup>303</sup> The initial technical support document

294. *Id.* at 1705–06.

295. *Id.* at 1707.

296. *See* Luttrell, *supra* note 121, at 178–80; *see also* Kysar, *Politics By Other Meanings*, *supra* note 37, at 60.

297. *See, e.g.*, Driesen, *Cost-Benefit Analysis and Precaution*, *supra* note 233, at 806 ("Even worse are the 'known unknowns'—crucial issues such as climate sensitivity . . . for which scientific research has not resolved the fundamental uncertainty and may not be able to do so (at least until it is too late to act on this information and prevent worst-case outcomes)."); *see also* Revesz, *supra* note 237, at 1440 ("[The federal SCC] does not sufficiently capture the risk of catastrophic impacts and important but difficult-to-quantify effects such as ocean acidification. As a result, the current SCC estimates are likely too low, but these shortcomings should diminish as modeling technologies improve." (footnotes omitted)).

298. *See* Masur & Posner, *The Limits of Cost-Benefit Analysis*, *supra* note 292, at 1581.

299. *Id.* at 1585 (discussing IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 35, and noting that the IWG's methodology presumes a linear relationship between benefits and reductions in carbon emissions).

300. *Id.*

301. *See* Luttrell, *supra* note 121, at 143–44, 165–68 (noting these criticisms of the federal SCC and challenging the privileged status of Circular A-4, guidance that she characterizes as "incoherent" and "illegitimate").

302. *See, e.g.*, Driesen, *supra* note 233, at 825–26; Crespi, *supra* note 130, at 229–31.

303. *See* Masur & Posner, *The Limits of Cost-Benefit Analysis*, *supra* note 292, at 1580–81. While a few right-wing think tanks have argued that the federal SCC overstates impacts, most scientists believe the numbers to be significantly understated. *See id.* at 1581 n.102.

from 2010 acknowledged many areas in which lack of critical information limited the valuation effort.<sup>304</sup> These included such essential factors as climate sensitivity (the precise relationship between GHG levels and warming), country-specific impacts, uncertainty about the extent of potential noncatastrophic damages, and uncertainty about the risk of catastrophic impacts, “such as the collapse of the . . . West Antarctic Ice Sheet.”<sup>305</sup>

While analysts better understood some of these factors by 2015, huge gaps nonetheless remained. Addressing public comments that challenged the models’ failure to fully capture adverse impacts in 2015, the IWG responded:

[W]e agree that the models’ functional forms may not adequately capture potentially discontinuous “tipping point” behavior in Earth systems. In fact, large-scale earth system feedback effects (e.g., Arctic sea ice loss, melting permafrost, large scale forest dieback, changing ocean circulation patterns) are not modeled at all in one IAM, and are imperfectly captured in the others.<sup>306</sup>

The IWG suggested that the higher (ninety-fifth percentile) figure was included “partly to address this concern” and stated that it would “seek external expert advice on the technical merits and challenges of potential approaches to improve the representation of these components of the modeling in future revisions.”<sup>307</sup>

Concerns about methodology are not trivial. The federal SCC played a real role in decisionmaking about regulations with the potential to substantially affect U.S. GHG emissions. For example, between 2009 and July 2015, federal agencies used the federal SCC in thirty-four proposed federal rulemakings governing large industries that produce a substantial portion of U.S. GHG emissions, including auto manufacturers, cement manufacturers, industries using large boilers, petroleum refineries, and appliance and machinery manufacturers.<sup>308</sup> The Obama EPA used the federal SCC to analyze the benefits of its Clean Power Plan,<sup>309</sup> a rule limiting emissions from the fossil fuel-fired power plants, which are “by far [the] largest emitters of GHG emissions . . . among stationary sources in the U.S.”<sup>310</sup>

While certainly better than ignoring climate impacts, applying the federal SCC to set these standards could create a false impression of precision. Yet even the highest number in the federal SCC (set at the ninety-fifth percentile) will not

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304. See, e.g., IWG, 2010 TECHNICAL SUPPORT DOCUMENT, *supra* note 35, at 11 (“As an empirical matter, the development of a domestic SCC is greatly complicated by the relatively few region- or country-specific estimates of the SCC in the literature.”); *id.* at 12–13 (describing the scientific uncertainties in determining the “equilibrium climate sensitivity,” a measure of the relationship between increases in atmospheric GHGs and temperature change).

305. *Id.* at 29.

306. IWG, RESPONSE TO COMMENTS, *supra* note 5, at 15.

307. *Id.* at 15.

308. *Id.* at 4; *The Social Cost of Carbon: Estimating the Benefits of Reducing Greenhouse Gas Emissions*, EPA, [http://19january2017snapshot.epa.gov/climatechange/social-cost-carbon\\_.html](http://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html) [<http://perma.cc/734R-J9U5>] (archived Jan. 19, 2017).

309. See EPA, REGULATORY IMPACT ANALYSIS FOR THE CLEAN POWER PLAN FINAL RULE, at 4-3 (2015).

310. *Id.* at ES-1.

be sufficiently high because it cannot capture the breakdown of current social systems, including markets, that may occur with extreme impacts.<sup>311</sup> Such a level of breakdown would render these numbers meaningless.

As Michael P. Vandenbergh and Jonathan A. Gilligan aptly argued, climate change exemplifies the analytical challenges presented by a “macro-risk,” a type of risk for which CBA is poorly suited.<sup>312</sup> As they explained, the leading IAMs fail to include potentially catastrophic “fat tailed” risks; that is, they ignore “disturbingly high likelihoods of temperature increases and sea level rises that could cause the kinds of systemic failures that almost brought down the financial system in 2008.”<sup>313</sup> The damage from the incompletely captured system effects, such as large-scale forest dieback, extensive saltwater intrusion into drinking water supplies, dramatic sea level rise, or fishery destruction from ocean acidification, would dramatically harm the economy in unprecedented, and hence unpredictable, ways.<sup>314</sup> The models’ omission of catastrophic risks means that the federal SCC fails to reflect the most important consequences of climate change.

Significantly, the IWG’s comment about tipping points also demonstrates that the IWG failed to understand the full significance of the term. The concept of a tipping point not only describes a catastrophic impact but also encompasses two important concerns. First, warming could trigger *irreversible* changes to critical environmental systems.<sup>315</sup> Second, some of these could trigger vicious feedback cycles,<sup>316</sup> potentially rendering it impossible to reverse global warming through human policies and actions.<sup>317</sup> For example, melting of the Arctic permafrost—which the IPCC described as “virtually certain” with continued warming—would release both carbon dioxide and methane that is currently stored in the frozen tundra.<sup>318</sup> At some undetermined point, atmospheric GHG concentrations could trigger runaway global warming.<sup>319</sup> Such effects would

311. See Steffen et al., *supra* note 75, at 8252–59 (hypothesizing a temperature threshold after which earth temperatures may never stabilize and which would cause “serious disruptions to ecosystems, society, and economies”).

312. See generally Michael P. Vandenbergh & Jonathan A. Gilligan, *Macro-Risks: The Challenge for Rational Risk Regulation*, 21 DUKE ENVTL. L. & POL’Y F. 401 (2010).

313. *Id.* at 402.

314. *Id.* at 404.

315. Steffen et al., *supra* note 75, at 8254–55; see Vandenbergh & Gilligan, *supra* note 312, at 403.

316. See IPCC, SYNTHESIS REPORT, *supra* note 39, at 73–74 (“Examples that could substantially amplify climate change are the boreal-tundra Arctic system (*medium confidence*) and the Amazon forest (*low confidence*). A reduction in permafrost extent is *virtually certain* with continued rise in global temperatures. Current permafrost areas are projected to become a net emitter of carbon (CO<sub>2</sub> and CH<sub>4</sub>) with a loss of 180 to 920 GtCO<sub>2</sub> (50 to 250 GtC) under RCP8.5 over the 21st century (*low confidence*).”).

317. See Steffen et al., *supra* note 75, at 8257.

318. IPCC, SYNTHESIS REPORT, *supra* note 39, at 74.

319. See Steffen et al., *supra* note 75, at 8255 (“[I]f the rate of climate change is too large or too fast, a tipping point can be crossed, and a rapid biome shift may occur via extensive disturbances . . .”).

render meaningless the presumption of future wealth that justifies discounting and the broader market projections used to analyze regulatory costs and benefits.

Surely avoiding such an outcome should be paramount. As Vandenberg and Gilligan sensibly remarked: “We believe that reducing the likelihood of truly catastrophic outcomes should be a central goal of any system designed to achieve rational risk management. That may appear to be an obvious proposition, but . . . the risk-assessment and risk-management communities are not functioning as if that is the central goal.”<sup>320</sup>

The system of regulatory impact assessment under OIRA demands that regulators monetize climate change benefits or risk ignoring them.<sup>321</sup> In describing “[r]igorous evaluation of benefits and costs” as a “core tenet” of federal rulemaking, the IWG recognized the likelihood that unquantified benefits would be overlooked: “Estimates of the SCC allow the effects of CO<sub>2</sub> emission changes on society to be counted in benefit cost analysis. Without estimates of the SCC, the effect of a change in CO<sub>2</sub> emissions would be considered qualitatively but could not be quantified in the bottom-line benefit cost estimates.”<sup>322</sup>

Given this potential to entirely overlook climate change, monetizing the benefits of climate change mitigation through the federal SCC provided a short-term win for the environment. Even the Trump administration’s reanalysis and reduction of the values given to avoided harm in its proposed repeal and replacement of the Clean Power Plan<sup>323</sup> demonstrates a partial (if very incomplete) victory compared to his administration’s rhetoric because it implicitly concedes that humans cause climate change that harms society. At the same time, it also demonstrates the malleability of the RIA tool and the risk of excessive presidential control over agency analysis.

#### B. Fossil Fuel Industries and Baseline Market Distortion

Even assuming away methodological and ethical concerns, the federal SCC is part of a formalized system of CBA that favors status quo resource distributions and therefore impedes regulatory progress. Moreover, by treating existing conditions as a baseline, this system ignores the historical subsidization of fossil fuel industries that has distorted U.S. markets and infrastructure.<sup>324</sup>

To effectively address climate change risks, policymakers must dramatically shift behavioral patterns and realign infrastructure in large-scale social and

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320. Vandenberg and Gilligan, *supra* note 312, at 404.

321. See *supra* Section II for a discussion of how OIRA regulators often give no value to certain benefits and how these missing benefits skew their CBAs.

322. IWG, RESPONSE TO COMMENTS, *supra* note 5, at 2–3.

323. Exec. Order No. 13,783 § 5(vi), 82 Fed. Reg. 16,093, 16,096 (Mar. 28, 2017).

324. See SALVATORE LAZZARI, CONG. RESEARCH SERV., RL33578, ENERGY TAX POLICY: HISTORY AND CURRENT ISSUES, at CRS-2 to CRS-3 (2008); Melissa Powers, *Sustainable Energy Subsidies*, 43 ENVTL. L. 211, 219–20 (2013).

economic systems.<sup>325</sup> In addition to changes in other sectors, effective mitigation depends upon thoroughgoing reconfiguration of the power and transportation systems that have deeply entrenched physical and legal infrastructure.<sup>326</sup> For example, to sufficiently reduce GHG emissions the United States will need to quickly decarbonize its electricity supply.<sup>327</sup> This necessitates shifting away from fossil fuel-based generation (which accounted for roughly 63% of the supply in 2017) and in particular replacing carbon-intensive coal-fired power plants (which produced approximately 30% of the grid's electricity in 2017)<sup>328</sup> with low-carbon alternatives.<sup>329</sup> CBA layers legal barriers onto an already substantial challenge of transforming this sector.<sup>330</sup>

Instead of giving regulators a neutral tool to advance these needed changes, the approach to CBA enshrined in OMB guidance and OIRA practice perpetuates an antiregulatory vision based upon a presumption of market neutrality that does not exist. By assuming that interference with existing markets undermines more effective private ordering, formal CBA ignores the role that past policies have played in promoting development of fossil fuel-based industries and advancing their ability to garner market share. To imagine that regulating their impacts interferes with an otherwise free market and private ordering is absurd in light of the United States' history of massive subsidization of fossil fuel industries that has warped production, consumption, infrastructure development, and energy supplies in the United States.<sup>331</sup>

As one congressional analyst explained, for nearly five decades, U.S. tax policy pushed development of fossil fuels, distorted markets, and artificially

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325. See IPCC, SYNTHESIS REPORT, *supra* note 39, at 94 (suggesting that new governance structures may be necessary to overcome systemic and behavioral inertia that impede climate change mitigation and adaptation).

326. See *id.* at 98–102 (suggesting “well-designed systemic and cross-sectoral mitigation strategies” to reduce energy use and emissions).

327. *Id.* at 99 (“Decarbonizing (i.e., reducing the carbon intensity of) electricity generation is a key component of cost-effective mitigation strategies in achieving low stabilization levels . . .”).

328. *What Is U.S. Electricity Generation by Energy Source?*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/tools/faqs/faq.php?id=427&t=3> [<http://perma.cc/HT4U-ECGV>] (last visited Feb. 15, 2019).

329. See IPCC, SYNTHESIS REPORT, *supra* note 39, at 100 (“Decarbonization of the energy supply sector (i.e., reducing the carbon intensity) requires upscaling of low- and zero-carbon electricity generation technologies (*high confidence*).” (emphasis omitted)).

330. It also pits regulators against politically and economically powerful owners who have strong incentives to perpetuate these industries.

331. See LAZZARI, *supra* note 324, at CRS-2 to CRS-3 (“Historically, federal energy tax policy was focused on increasing domestic oil and gas reserves and production; there were no tax incentives for energy conservation or for alternative fuels. Two oil/gas tax code preferences embodied this policy: (1) expensing of intangible drilling costs (IDCs) and dry hole [80% of all wells drilled] costs, which was introduced in 1916, and (2) the percentage depletion allowance, first enacted in 1926 (coal was added in 1932). . . . These and other tax subsidies . . . (e.g., capital gains treatment of the sale of successful properties, the special exemption from the passive loss limitation rules, and special tax credits) reduced marginal effective tax rates in the oil and gas industries, reduced production costs, and increased investments in locating reserves (increased exploration). They also led to more profitable production and some acceleration of oil and gas production (increased rate of extraction), and more rapid depletion of energy resources than would otherwise occur.” (footnote omitted)).

lowered prices, thereby increasing dependence on fossil fuels and diverting investment that would have otherwise gone elsewhere:

Such subsidies tend to channel resources into these activities that otherwise would be used for oil and gas activities abroad or for other economic activities in the United States. Relatively low oil prices encouraged petroleum consumption (as opposed to conservation) and inhibited the development of alternatives to fossil fuels, such as unconventional fuels and renewable forms of energy. Oil and gas production increased from 16% of total U.S. energy production in 1920 to 71.1% of total energy production in 1970 . . . .<sup>332</sup>

In addition to decades of tax subsidies,<sup>333</sup> fossil fuel-based utilities have benefitted from monopolies, preemption of local buying preferences,<sup>334</sup> and a grant of eminent domain powers that reduces property acquisition costs.<sup>335</sup> These subsidies prompted development of entire industries with supportive private and public infrastructure, such as roads, pipelines, and transmission lines that connect existing fossil fuel-dependent electricity generation sources to consumers.<sup>336</sup> Although federal subsidies for renewable energy have become available over the last decade, unpredictable and intermittent funding has limited their effect on infrastructure investment compared to long-term fossil fuel subsidies.<sup>337</sup>

Moreover, by limiting new market entrants, public utility law constrains electricity users' ability to benefit from alternatives, such as efficient and renewable microgrids.<sup>338</sup> Fossil fuels have been further subsidized by lax

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332. *Id.* at CRS-3.

333. ENERGY INFO. ADMIN., DIRECT FEDERAL FINANCIAL INTERVENTIONS AND SUBSIDIES IN ENERGY IN FISCAL YEAR 2010, at 5 (2011).

334. *See* Powers, *supra* note 324, at 221; *see also* Amy L. Stein, *Breaking Energy Path Dependencies*, 82 BROOK. L. REV. 559, 569 (2017) ("The legal regime governing the electricity industry has remained relatively unchanged since the 1900s. Based on principles of public utility law, electric utilities enjoyed monopolies with near guaranteed rates of return in exchange for service. This so-called 'regulatory compact' was premised on the mutual benefits provided between the state or regulator and the investor-owned utility (IOU). Eventually, federal law began to encourage competition among electricity generators. Even though the world had changed in a way that resulted in many more generation options, the law remained entrenched." (footnotes omitted)).

335. *See* Alexandra B. Klass, *Takings and Transmission*, 91 N.C. L. REV. 1079, 1105 (2013) ("[E]arly on, state legislatures granted the power of eminent domain to utility companies and others to generate electricity and build the means of transporting it.")

336. *See* Stein, *supra* note 334, at 564–68 (discussing four characteristics of increasing returns path dependence reflected in energy infrastructure).

337. *See* Powers, *supra* note 324, at 214.

338. *See* Sara C. Bronin, *Curbing Energy Sprawl with Microgrids*, 43 CONN. L. REV. 547, 551 (2010) ("Although current state laws prohibit or severely limit alternative energy microgrids, such arrangements are attractive from a public policy perspective. They decentralize energy production, reducing the need for nationwide transmission lines and large-scale centralized plants. They allow property owners to achieve economies of scale by spreading the costs and the risk of renewable energy installation and maintenance among many parties. They provide cleaner alternatives to conventional energy methods of production. And they improve system efficiencies by reducing the amount of energy lost during transmission across long distances to end-users.").



environmental laws that allow fossil fuel companies to externalize the cost of pollution.<sup>339</sup>

This set of background circumstances makes less carbon-intensive options appear to be more expensive than fossil fuels. Amy Stein has aptly described how this comparative advantage influences investors' choices:

The most overwhelming “logic” is that developers will invest in the infrastructure with the greatest financial returns (e.g., lowest cost investment for the highest financial returns). Applying this existing logic, energy actors will continue to invest in fossil fuel infrastructure (e.g., fossil-fueled power plants and oil and gas pipelines). . . .

. . . [And] renewable energy will often lose. Even though renewable energy has zero fuel costs compared to natural gas, coal, and oil, these cost-benefits are offset by high sunk costs associated with renewable infrastructure investments compared to the amount of electricity produced. On paper, the fossil fuel option will almost always be the “least cost” option under the current energy policies.<sup>340</sup>

Similarly, the long history of fossil fuel subsidization distorts formal CBA. Using existing practices as an analytical baseline for comparing the costs and benefits of new regulations—as formal CBA pursuant to Circular A-4 directs—embeds these distortions into an agency's analysis, making fossil fuel-based power production appear artificially cheap in comparison to cleaner fuels.

But this is not just a question of numerical accuracy or even fairness to alternative power producers and consumers. Rather this history undermines one of the core premises relied upon to support CBA's widespread applicability: the presumption that regulation should defer to private ordering because markets more effectively distribute resources. Whether or not one agrees with this assumption, it is clear that existing energy markets are *highly distorted*, and they certainly could not be described fairly as developed through or currently acting as a free market.<sup>341</sup>

### C. Cognitive Bias and the Limits of Imagination

Effective climate change policy not only depends upon coming to terms with the past subsidization of fossil fuels but also upon rethinking our approach to the future. The efficacy of CBA for agency decisionmaking depends upon regulators' ability to perform an imaginative act—projecting into the future and predicting how the world would look both with and without the proposed

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339. See Powers, *supra* note 324, at 220.

340. Stein, *supra* note 334, at 576–77.

341. One might characterize these distortions as market failures supporting regulation under executive orders or Circular A-4. Although Circular A-4 directs analysts to assess market failures, this direction applies to present conditions and does not evaluate the cumulative and systemic effects of past market distortions. See OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 8, at 4. The difficulty of characterizing the systemic distortion in energy markets as a specific market failure in the context of CBA for a single proposed regulation impedes such an approach. Moreover, the apparent presumption among agencies and commentators that energy sector regulations should be cost justified suggests that policymakers have not recognized these alterations as undermining the free market presumption.

regulation. The analyst must imagine what resources would be affected positively and negatively and translate these projections into monetary figures. Advocates for broad application of CBA overestimate regulators' predictive capacity, assuming that all or most benefits and costs can be assessed *ex ante*.<sup>342</sup>

The CBA exercise is based on economic theories gleaned from only the most recent part of human history. Modern economies have existed for only a fraction of time compared with the thousands of years it took for the climate to evolve into sufficiently stable environmental conditions to support markets. This seems like a particularly limited theoretical basis for projecting across time spans of centuries during which presently emitted GHGs will continue to alter the earth's climate. The methodology currently in vogue for applying this set of theories to policy problems—formal CBA under OIRA oversight—risks framing decisions in terms that render invisible their most important aspect: the potential for catastrophic changes to Earth's habitability. By representing decision options numerically and employing summary charts, RIA creates the illusion the impacts and risks are well understood and presumably modifiable by human intervention.<sup>343</sup> As such, the federal SCC can create a false sense of control, obscuring the urgent and unpredictable nature of the problem. As Gregory Mandel and James Thuo Gathii explained, "The quantitative appearance of cost-benefit analysis lures unsuspecting (and even suspecting) decision makers to believe that it offers far more than it can actually provide."<sup>344</sup> Even among those knowledgeable about the explicit limitations of the analysis, "once cost-benefit analysis spits out a number, people attach to it."<sup>345</sup>

As Sunstein's discussion of availability cascades<sup>346</sup> illustrates, risk perception is affected by the limits of imagination.<sup>347</sup> Although policymakers and the public have likely seen more news about climate change in recent years, the issue nonetheless greatly challenges the imagination. Because climate change's impacts accrete over time, they lack the drama of sudden, single event harms, such as terrorist attacks, that evoke vivid images. Most importantly, the familiarity of present conditions makes it difficult (if not impossible) to imagine a world lacking the ecological systems that we take for granted. Indeed, their apparent constancy may have lulled us into complacency because we fail to notice our dependence on their stability.

The relative stability of the earth's climate over the last ten thousand years enabled the development of modern social structures, including the transition to

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342. See KYSAR, REGULATING FROM NOWHERE, *supra* note 21, at 72 (describing how the natural systems that are the subject of environmental law resist overly simplistic assumptions that they are "well behaved . . . [.] follow linear operating rules, map onto known probability distributions, and exhibit stable equilibrium outcomes").

343. See Mandel & Gathii, *supra* note 21, at 1052.

344. See *id.*

345. *Id.*

346. See *supra* Part I.B.

347. See SUNSTEIN, RISK AND REASON, *supra* note 21, at 78–79. See also *supra* notes 104–10 and accompanying text for a discussion of the effects of cognitive distortion and bias on individual risk perception.

agricultural societies<sup>348</sup> and settlement along coastlines.<sup>349</sup> The globally interdependent market economy operating within a modern nation-state system emerged only within the most recent part of this atmospherically stable period. Modern institutions around which humanity currently organizes a way of life depend upon systems that are highly vulnerable to climate change impacts, including the goods movements sector, power production and distribution, agriculture, and communication and transportation infrastructure.<sup>350</sup>

Despite our dependence upon the stability of background environmental conditions to support social systems, economic activity, and infrastructure, thus far we have fallen far short in our efforts to prevent self-inflicted climate destabilization. In fact, we have come nowhere near to either sufficiently reducing emissions or adequately planning to adapt to even modest impacts.

Well-recognized cognitive biases likely play an overdetermined role in climate change policy, making these changes harder. Researchers recognize a cognitive bias toward preserving the status quo.<sup>351</sup> In addition, the omission bias causes us to “weigh the harms of omissions as less severe than the harms of actions.”<sup>352</sup> Loss aversion and the effect of sunk costs further the tendency to continue with business as usual.<sup>353</sup> Unfortunately, formalized review under OIRA exacerbates these tendencies by putting the burden on regulators to justify changes, protecting sunk costs by characterizing a requirement to upgrade polluting technology as a cost that must be justified and treating omission (failure to regulate) as less damaging than actions (regulations).<sup>354</sup>

Modeling provides comfort and may create a false sense of control when in fact the complexity of the earth systems and the potential devastation warrant an entirely different kind of analysis and policy response than might be appropriate for more comprehensible and controllable risks. Although in the short run the incorporating a social cost of carbon estimate into formalized CBA is preferable to omitting climate benefits from consideration in rulemaking, the broader

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348. Joan Feynman & Alexander Ruzmaikin, *Climate Stability and the Development of Agricultural Societies*, 84 CLIMATIC CHANGE 295, 309 (2007) (“We conclude that there is considerable evidence that climate variability inhibited the development of agriculture until ~ 11,000 [years before present] when relative climate stability was established and many independent agricultural systems were developed.”).

349. See GARY B. GRIGGS, COASTS IN CRISIS: A GLOBAL CHALLENGE 4–5 (2017) (explaining that, after millennia of volatility, sea level became relatively stable about seven thousand years ago, creating sufficient constancy for humans to settle in fertile coastal areas).

350. See IPCC, SYNTHESIS REPORT, *supra* note 39, at 67–73 (describing climate change impacts to “water, food and urban systems, human health, security and livelihoods”).

351. See Jacob M. Nebel, *Status Quo Bias, Rationality, and Conservatism About Value*, 125 ETHICS 449, 450 (2015); see also Kahneman et al., *supra* note 120, at 197–99 (defining status quo bias).

352. Nebel, *supra* note 351, at 455.

353. See *id.*

354. See *supra* Part II.A for a discussion of the high burden OIRA puts on agencies seeking to justify new regulations. See also Kysar, *Politics by Other Meanings*, *supra* note 37, at 50 (explaining that climate change policies developed through CBA will be limited because “economic cost-benefit analyses . . . are ‘tuned’ only to recommend marginal, incremental changes to an otherwise unquestioned status quo”).

administrative process of which the federal SCC is part subverts effective policymaking and should be reformed.<sup>355</sup> Given the difficulty of imagining a counterfactual world in which social systems and markets have broken down, the calculations in the federal SCC risk implying to policymakers that climate change is subject to human control. In fact, limited understanding of future impacts and uncertainty about the emissions threshold for crossing tipping points create a real danger that we could inadvertently trigger irreversible, runaway warming.<sup>356</sup>

Although one could approach climate change as an issue uniquely unsuited to CBA while leaving intact the formal system of review under OIRA for nonclimate regulations,<sup>357</sup> this would be both impractical and unwise. Efforts to mitigate climate change will affect multiple economic sectors—including many that will need to reduce GHG emissions<sup>358</sup> while others may be required to limit their activities to preserve natural carbon sinks such as forests.<sup>359</sup> Regulations not targeted primarily at GHG reductions for climate change mitigation will thus easily intersect with climate change policy, making such line drawing difficult.

Moreover, while climate change presents a more extreme example of CBA's flaws, uncertainties and insufficient appreciation for the complexity of human and ecological systems undermine CBA for many regulations.<sup>360</sup> While the modeling challenges are particularly stark for climate change, this presents only extreme versions of inadequacies that affect other regulatory issues. Instead, the issue highlights the need to reform more broadly the overly formalized model of CBA that has dominated administrative law for the past several decades.

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355. See Sinden, *Formality and Informality*, *supra* note 84, at 97 (noting how “the pull toward formality in the executive branch sparks controversy in policy and academic circles and is out of step with Congress and the courts”).

356. Cf. Weitzman, *supra* note 38, at 1 (describing as “unsettling” the “deep structural uncertainty in the science coupled with an economic inability to evaluate meaningfully the catastrophic losses from disastrous temperature changes”).

357. See, e.g., Masur & Posner, *The Limits of Cost-Benefit Analysis*, *supra* note 292, at 1563. Jonathan Masur and Eric Posner, both of whom generally support application of CBA to agency decisionmaking, view climate change as a special case; they have argued that CBA analysis of this issue is too fraught with technical difficulty and inevitably political decisionmaking to be meaningful. *Id.* After evaluating several agencies' regulatory impact assessments for climate-related regulations, they found a “wide gap between the theory of cost-benefit analysis and agencies' performance.” *Id.* at 1560; see also Vandenbergh & Gilligan, *supra* note 312, at 409–12 (arguing that, unlike micro-risks, macro-risks such as climate change need a new approach instead of conventional CBA).

358. See, e.g., Trisolini, *supra* note 65, at 632–35.

359. See, e.g., David Whitehead, *Forests as Carbon Sinks—Benefits and Consequences*, 31 TREE PHYSIOLOGY 893, 899 (2011).

360. See KYSAR, REGULATING FROM NOWHERE, *supra* note 21, at 96 (drawing upon complexity theory to argue that CBA is “fundamentally mismatched” to policymaking on environmental, health, and safety issues because these decisions inevitably involve persistent uncertainties and potentially irreversible consequences).

## IV. MODIFYING CBA'S ROLE IN REGULATORY DECISIONS

Based on an idealized and optimistic vision of CBA, Sunstein and others have argued for this tool's wider application.<sup>361</sup> A better approach would restructure the process altogether by identifying unsuitable contexts for CBA and deformalizing review, as described below. Removing OIRA's role as a gatekeeper would allow for a more rational consideration of costs and benefits because a less formal approach could more effectively incorporate qualitative discussion. Such a shift would require giving up on the wild hope for a single tool for all regulatory problems. It would also require acknowledging that it is not possible to objectively resolve questions that, in fact, require subjective judgment. Overreliance on CBA obscures political realities: that government must respond to potential harm with incomplete information and that regulation unavoidably requires difficult tradeoffs with no right answer.<sup>362</sup>

A. *A Modest Step: Remembering the Role of Technology Forcing*

As a modest step, Justice Breyer's *Whitman v. American Trucking Ass'ns*<sup>363</sup> concurrence can provide an initial basis for identifying unsuitable regulatory contexts for CBA. Despite generally endorsing agencies' use of CBA (unless statutorily precluded), Justice Breyer also recognized why Congress sometimes prohibited its use.<sup>364</sup> In the Clean Air Act, Congress's decision to disallow cost stemmed not only from strong concern for public health but also from Congress's intention for the Act to be technology forcing.<sup>365</sup> Citing legislative history, Justice Breyer explained these aspirations:

Senator Edmund Muskie, the primary sponsor of the 1970 amendments to the Act, introduced them by saying that Congress' primary responsibility in drafting the Act was not "to be limited by what is or appears to be technologically or economically feasible," but "to establish what the public interest requires to protect the health of persons," even if that means that "*industries will be asked to do what seems to be impossible at the present time.*"<sup>366</sup>

CBA is not an appropriate tool for technology-forcing policy goals, in other words, when social problems demand action to overcome systemic inertia. As Justice Breyer explained, the "technology-forcing objective makes regulatory efforts to determine the costs of implementation both less important and more difficult" because "[i]t means that the relevant economic costs are

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361. See *supra* note 24 for examples of scholars making this argument.

362. See Parker, *supra* note 95, at 1420–21 (arguing that CBA "disregard[s] all unquantified costs and benefits" and "ignore[s] important non-linearities of . . . risk preferences").

363. 531 U.S. 457 (2001). In *Whitman*, the Court refused to read compliance costs into the national ambient air quality standard setting provisions CAA section because of their potential to undermine Congress's primary goal of determining health-based standards. *Whitman*, 531 U.S. at 486.

364. *Id.* at 491–93 (Breyer, J., concurring).

365. *Id.* at 491–92.

366. *Id.* at 490–91 (emphasis in original) (quoting 116 CONG. REC. 32,901–32,902 (1970) (statement of Sen. Muskie)).

speculative.”<sup>367</sup> They are speculative because “they include the cost of unknown future technologies.”<sup>368</sup> Under these circumstances, “efforts to take costs into account can breed time-consuming and potentially unresolvable arguments about the accuracy and significance of cost estimates.”<sup>369</sup> This comment captures something often overlooked by CBA’s proponents: requirements to justify new rules with in-depth modeling have costs of their own,<sup>370</sup> including harm from delayed or failed regulations.

Complex contemporary challenges, particularly those posed by climate change, require a similarly nuanced understanding of the need for technology forcing—one that does not idealize one regulatory tool.<sup>371</sup> The world in which we live will increasingly require nuanced regulatory judgments to confront unprecedented and evolving risks. In some cases, this will require that industries develop entirely new technologies and practices. These changes will meet resistance because sunk costs, inertia, path dependence, and cognitive biases (among other factors) favor existing practices.<sup>372</sup> Upfront modeling of costs and benefits impedes critical efforts to redirect industries through technology forcing.<sup>373</sup>

#### B. *Another Option: A NEPA Model of Procedural Analysis*

A less modest reform would deformalize the CBA components of regulatory impact assessment, treating it solely as a procedural mandate akin to

367. *Id.* at 492–93.

368. *Id.* at 493.

369. *Id.*

370. *See* Coates, *supra* note 134, at 888 (“Perhaps surprisingly, given that CBA has been part of administrative law for decades, CBA of CBA has itself never been adequately conducted . . .”).

371. *See Whitman*, 531 U.S. at 495 (Breyer, J., concurring). This does not mean that the alternative to the cost-benefit state is economic ruin or even regulatory irrationality. As Justice Breyer explained in his *Whitman* concurrence, statutory provisions that require agencies to set adequate standards for the protection of public health, even with the addition of a margin of safety, allow agencies to make context appropriate decisions about risk:

[T]his interpretation of § 109 does not require the EPA to eliminate every health risk, however slight, at any economic cost, however great, to the point of “hurtling” industry over “the brink of ruin,” or even forcing “deindustrialization.” The statute, by its express terms, does not compel the elimination of *all* risk; and it grants the Administrator sufficient flexibility to avoid setting ambient air quality standards ruinous to industry.

. . . [The words] “requisite to protect the public health” with “an adequate margin of safety” . . . do not describe a world that is free of all risk—an impossible and undesirable objective. Nor are the words “requisite” and “public health” to be understood independent of context. We consider football equipment “safe” even if its use entails a level of risk that would make drinking water “unsafe” for consumption. . . . The Administrator can consider such background circumstances when “decid[ing] what risks are acceptable in the world in which we live.”

*Id.* at 494–95 (final alteration in original) (citations omitted) (first quoting *Am. Trucking Ass’ns v. EPA*, 175 F.3d 1027, 1037–38 (D.C. Cir. 1999); then quoting 42 U.S.C. § 4709(b) (2018); and then quoting *Nat. Res. Def. Council, Inc. v. EPA*, 824 F.2d 1146, 1165 (D.C. Cir. 1987)).

372. *See supra* Part III.C.

373. *Whitman*, 531 U.S. at 492–93 (Breyer, J., concurring).

the environmental impact analysis requirement under the National Environmental Policy Act (NEPA).<sup>374</sup> Under this approach, agencies would still evaluate costs and benefits, but they would not be required to demonstrate net benefits before proposing regulations. Nor would executive orders, OIRA policy, or new statutory language direct them to select the regulatory option that maximizes net benefits. Costs and benefits could still play an informational role in decisionmaking, just as environmental impacts do under NEPA.

NEPA requires federal agencies to prepare a detailed environmental impact statement (EIS) for all “major Federal actions significantly affecting the quality of the human environment.”<sup>375</sup> The EIS must provide a “full and fair discussion of significant environmental impacts” and “inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.”<sup>376</sup>

The Supreme Court has held that, because NEPA is an “essentially procedural” statute,<sup>377</sup> it does not mandate “that agencies achieve particular substantive environmental results.”<sup>378</sup> Compliance with NEPA depends instead upon the adequacy of agencies’ efforts to study and disclose impacts before making decisions, and thus the courts do not review substantive policy choices.<sup>379</sup>

Nonetheless, the Supreme Court views this procedural requirement as sufficient to rationalize agencies’ decisionmaking, stating that NEPA review will “inject environmental considerations”<sup>380</sup> into their ultimate judgments and “integrate[]” environmental issues with other factors.<sup>381</sup> The Supreme Court has characterized NEPA as a statute that “ensures that the agency . . . will have available, and will *carefully consider*, detailed information concerning significant environmental impacts.”<sup>382</sup> Thus, the Court presumes that the process of analyzing environmental impacts will influence policymaking decisions even absent a substantive requirement that agencies select the least harmful alternative.

A parallel presumption could be applied to CBA. Under this approach, agencies could review and consider costs and benefits but would neither need to demonstrate a favorable cost-benefit ratio before proposing new regulations nor select the regulatory option that maximizes net benefits. Without these gatekeeping rules, qualitative discussion of unmonetizable costs and benefits could be more meaningfully included in agency decisionmaking. Agencies’

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374. See 42 U.S.C. § 4332(2)(A).

375. *Id.* § 4332(2)(C).

376. 40 C.F.R. § 1502.1 (2018).

377. *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 558 (1978). The Court further explained that the statute’s purpose was “to insure . . . fully informed and well-considered decision[s]” by federal agencies. *Id.*

378. See *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 371 (1989) (explaining that instead, NEPA “ensures that the agency will not act on incomplete information”).

379. See *id.*; *Vt. Yankee*, 435 U.S. at 558.

380. *Weinberger v. Catholic Action of Haw.*, 454 U.S. 139, 143 (1981).

381. See *Andrus v. Sierra Club*, 442 U.S. 347, 350 (1979).

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

explanation for their choice among regulatory options could discuss how limited data, uncertainty, and nonmonetizable and qualitative factors affected the decision without the threat that the rule would be blocked because it “failed” CBA. This approach would also allow for a more realistic representation of the limits of human knowledge.

Reliving agencies from this substantive mandate would allow OIRA to function as an advisor rather than a gatekeeper. As Revesz and Livermore have argued, centralized review holds the potential for harmonization of diverse agencies’ efforts.<sup>383</sup> Thus, OIRA could serve as a regulatory coordinator while also using its overarching position to identify gaps in regulatory coverage.<sup>384</sup>

C. *Avoiding Foolish Consistency: Going Full-Bore on Climate Change*

With climate change regulation, the most reasonable response will not be the timid one. Legal and economic training instill a notion that professionals respond with cool analysis and rational-sounding discussion of options, regardless of the issue’s scale. Despite the merits of this professionalism for many situations, this style of policy discussion risks extreme understatement with climate change.<sup>385</sup> Indeed, such a concern likely motivated Harvard economist Martin Weitzman to comment,

Perhaps in the end the climate-change economist can help most by *not* presenting a cost-benefit estimate for what is inherently a fat-tailed situation with potentially unlimited downside exposure as if it is accurate and objective—and perhaps not even presenting the analysis as if it is an approximation to something that is accurate and objective . . . . Even just acknowledging more openly the incredible magnitude of the deep structural uncertainties that are involved in climate-change analysis—and explaining better to policymakers that the artificial crispness conveyed by conventional IAM-based CBAs here is especially and unusually misleading . . . —might go a long way toward elevating the level of public discourse concerning what to do about [climate change].<sup>386</sup>

Climate change presents an existential threat to humanity at large, one that is self-imposed.<sup>387</sup> Instead of frittering away energy trying to escape the hobgoblin of agency overregulation, policymakers should throw everything possible at the climate juggernaut.

It is not hard to imagine a parallel scenario that would prompt full-out effort. Suppose, for example, that a large ship carrying many passengers begins taking on water after a severe storm. The ship cannot make it back to land

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383. REVESZ & LIVERMORE, *supra* note 141, at 190.

384. See COPELAND, *supra* note 172, at 19; REVESZ & LIVERMORE, *supra* note 141, at 190.

385. See Vandenbergh & Gilligan, *supra* note 312, at 401–06 (arguing that the current integrated assessment models do not account for fat-tailed risks).

386. Weitzman, *supra* note 38, at 18.

387. See, e.g., IPCC, SYNTHESIS REPORT, *supra* note 39, at v; Farber, *Coping with Uncertainty*, *supra* note 132, at 1665 (arguing that the future of climate change is uncertain “because it is not clear how much carbon humankind will continue to pump into the atmosphere, or at what rate”).



before sinking because it is too far out in the middle of the ocean and cannot call for help because the storm destroyed the ship's communication systems. Some investigation reveals that the damage lies close to the water line. Although the water is flowing slowly enough that repairs remain possible, the crew is not sure how long it will be before the water pressure causes the bulkhead wall around the small crack to collapse. In this event, the ship would sink quickly. The engineers have determined that passengers can do something very important to help the crew: throw heavy items overboard to raise the cracked area of the hull above the water line, thereby reducing water pressure. Many passengers and crew members will need to discard items to reduce the ship's weight sufficiently to raise its level above the water line. Even bringing the crack closer to the surface would reduce the water pressure somewhat.

The captain explains the situation over the intercom and announces her request that all passengers and crew throw items overboard as quickly as possible. I suspect that the vast majority of passengers and crew would take the most reasonable course of action; they would begin grabbing things and throwing them overboard. Either by the captain's order or spontaneously, many would work together to help get the heavier items off the boat. While it might initially appear "rational" to carefully calculate each item's monetary value and weigh the benefit of throwing it overboard against the cost of ship damage and the estimated likelihood of sinking, no sane person would take this course of action because monetary value would become irrelevant if the ship were to sink.

Instead of designing climate change policy according to some elusive vision of efficiency, we need to start with the end goal: preserving the relative stability of the earth's atmosphere upon which we depend.<sup>388</sup>

#### CONCLUSION

Earth appears to be uniquely suited to our existence, having provided us for millennia with a habitat containing oceans that rise and fall within a predictable range, sufficient rain to support forests and agriculture, precipitation distributed in time and space to rarely inundate or cause extreme draught, ambient temperatures to which we can adapt with clothing and shelter, and an array of other species with whom we interact. Climate change threatens to undermine this uniquely habitable environment for humanity. The greatest challenge may be in simply getting our minds around the enormity of a problem that threatens something seemingly unimaginable—the potential disappearance of background conditions that seem immutable.

Like other exercises in planning and forecasting, CBA requires regulators to evaluate the impact of not yet adopted regulations in not yet occurring circumstances. This exercise proves particularly challenging with global warming due to scientific uncertainty, geographic variation in global effects, and impacts

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388. Cf., David M. Driesen, *Climate Disruption: An Economic Dynamic Approach*, 42 ENVTL. L. REP. 10639, 10644–45 (2012) (arguing that the United States should adopt an economic dynamic approach that aims to avoid systemic risk).

that occur over a long time horizon.<sup>389</sup> Beyond these forecasting complexities lies a more profound conceptual challenge. While analysts generally rely on past experience for planning, forecasting, and calculating costs and benefits, climate change threatens to alter background ecological conditions in ways with which humans lack experience.<sup>390</sup> Thus, planners must evaluate the impact of proposed regulations in an ahistorical world that lacks preconditions for the current form of human society.<sup>391</sup> The demand for such analysis is more akin to a Zen koan than to a rational decision-making process.

In the short run, the entrenchment of formal CBA in federal agency practice and oversight makes the federal SCC necessary for recognition of climate harms in regulatory impact analysis. Prior agency incorporation of the SCC into analyses for adopted regulations might also provide some protection when courts review the Trump administration's regulatory rollbacks. General recognition that climate change imposes substantial economic costs could prompt otherwise reluctant policymakers to act. Even incomplete efforts to monetize climate change impacts, such as those encompassed in the federal SCC, could contribute to policy formation if used informally as an educational tool to focus attention on climate risks and to show how environmental harm causes economic harm. Concern for economic harm could mobilize political action and monetized figures might make impacts more comprehensible to some policymakers and private citizens.

But the theoretical underpinnings, antiregulatory structure of OIRA review, practical difficulties, and institutional history of formal CBA make it an unlikely tool to deliver the reorganization of social systems necessary to prevent catastrophic anthropogenic warming. Indeed, this Article argues there is much reason to suspect that it will impede these needed changes. Therefore, taking a longer view counsels for a different approach.

Constitutional rules guarantee that the Trump administration and its climate-ignorant stance will be replaced within no more than six years. The culture of administrative review has a potentially much longer life. Recognizing the imperative for a transformational governmental response to impending climatic changes, all branches of government should pull back from the emphasis on formal CBA. Courts should interpret statutes to maximize agencies' ability to base decisions on factors not well captured in current regulatory review

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389. See Vandenberg & Gilligan, *supra* note 312, at 412 ("Even strong proponents of cost-benefit analysis acknowledge the difficulty of applying it to this sort of macro-risk. Richard Posner writes that 'global warming seems like the poster child for the limitations of cost-benefit analysis.'" (quoting RICHARD POSNER, *CATASTROPHE: RISK AND RESPONSE* 155 (2007))); *cf. id.* at 426 ("For catastrophic climate change, the uncertainty about outcomes and tipping points, the mismatch between near-term costs and long-term benefits, and the uneven distribution of costs and benefits among countries and economic sectors all complicate risk management.").

390. See Steffen et al., *supra* note 75, at 8254–55 (identifying environmental "changes [that] are largely irreversible on timeframes that matter to contemporary societies" that will result from climate change).

391. See *id.* at 8256 ("Hothouse Earth is likely to be uncontrollable and dangerous to many, particularly if we transition into it in only a century or two, and it poses severe risks for health, economies, political stability . . . , and ultimately, the habitability of the planet for humans.").

practices. The executive should either eliminate review altogether or substantially revise it to downplay formal balancing and consider how OIRA can serve to coordinate efforts and facilitate (rather than block) needed regulatory changes. Congress should resist academic suggestions to more broadly require formal CBA through statutory directives to agencies. Finally, law and economics scholars should recognize the limits of this analytical tool to avoid letting “the perfect be the enemy of the good.”<sup>392</sup>

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392. A phrase attributed to Voltaire.