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CONTENTS

ARTICLES

NOTES

Information for Environmental Governance: The Value of State of the Environment Reports in a Polarized Era

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The increasingly dysfunctional federal democratic process poses challenges to effective, consistent responses to the most important environmental risks. Information about the state of the environment and the performance of environmental protection measures can play a surprisingly important role by providing the information necessary for the public and decision-makers to resist disinformation efforts and prioritize the responses to these threats. Until 1997, the White House Council on Environmental Quality (CEQ) produced annual State of the Environment (SOE) reports as required by Section 201 of the National Environmental Policy Act of 1969. In response to paperwork reduction legislation adopted in 1995, though, the CEQ interpreted the paperwork legislation to require termination of the SOE reports, and no comprehensive alternative has filled the gap. In the absence of these reports, federal agencies, members of Congress, and the public lack a national assessment of the greatest environmental risks and data on progress toward addressing them. Congress and the White House are unlikely to require development of SOE reports in the near term, but this Article outlines a viable alternative: regional, state, and local SOE initiatives. The Article draws on a state-specific case study that included development of an SOE report via a collaborative, multi-scalar, and data-driven approach. The case study demonstrates how an open-source, iterative process can serve as an example for other states and local governments and can improve environmental governance in the United States even in this polarized era.

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Table of Contents

Introduction

Comparable, consistent, and reliable information is central to rational risk regulation. An extensive literature in the 1980s and 1990s identified the value of processes that generate meaningful indicators of environmental quality for environmental governance and stakeholder engagement.[1] At the time, the focus of this scholarship was on using information to reduce the "democracy deficit" that arose from the public's inability to penetrate the complexities of regulatory processes and the "iron triangle" of agency experts, advocacy groups, and Congressional committees.[2] Leading scholars identified the ends-versus-means problem, in which environmental laws lost popular support and became subject to capture by special interests because the then-dominant

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1 *See* Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 Stan. L. Rev. 1333 (1985); Michael P. Vandenbergh, *An Alternative to Ready, Fire, Aim: A New Framework to Link Environmental Targets in Environmental Law*, 85 Ky. L.J. 803 (1997); Richard B. Stewart, *A New Generation of Environmental Regulation*, 29 Cap. U. L. Rev. 21, 27–38 (2001); Daniel C. Esty, *Next Generation Environmental Law: A Response to Richard Stewart*, 29 Cap. U. L. Rev. 183 (2001).

2 *See* Richard B. Stewart, *Antidotes for the "American Disease,"* 20 Ecology L. Q. 85 (1993). *See* Ackerman & Stewart, *supra* note 1, at 1334–35. The proposed remedy for the democracy deficit, cap-and-trade systems, became a central focus the acid rain program in Title IV of the 1990 Clean Air Act Amendments, but it is not clear that it had the intended effects on democratic discourse. *See* Lisa Heinzerling, *Selling Pollution, Forcing Democracy*, 14 Stan. Env't L.J. 300, 325–27 (1995) (noting that only one floor statement during the debate over the Title IV provisions addressed the national goal for reducing acid rain precursor emissions and that members of Congress instead focused on allocating emissions reductions to the utilities in their districts).

command and control regulatory instruments focused on complex, opaque regulatory tools rather than the more publicly understandable pollution reduction goals that at least in theory could be the focus of cap-and-trade and other alternatives to the command and control regulatory system.[3] Other scholars then used the concept of informational regulation to propose effective new environmental protection measures.[4]

The democracy deficit debates of the 1980s and 1990s seem almost quaint in the modern era. Despite roughly two-thirds of the American population supporting action on climate change,[5] the White House has signaled that the United States ("U.S.") will scale back or eliminate participation in international and domestic efforts to address climate change.[6] For three decades, Congress has balked at carbon taxes or other polluter pays legislation. Meanwhile, the Supreme Court has substantially narrowed agency decisional space and regulatory enforcement tools. Additionally, roughly half the states have resisted climate and environmental measures, including banning the use of terms such as "climate change" or mention of the United Nations sustainable development goals ("SDGs").[7]

This Article argues that the core insight, first emphasized by leading scholars in the 1980s and 1990s, that information can reduce the democracy deficit in environmental policymaking, is more important than ever. In addition to a basic lack of information, misinformation efforts and polarization have increased the barriers to rational risk regulation.[8] Simply put, in the absence of accessible, accurate information

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3 *See* Stewart, *supra* note 2, at 89–92.

4 *See* Esty, *supra* note 1, at 183, 184–86; Robert J. Klee, *Enabling Environmental Sustainability in the United States: The Case for a Comprehensive Material Flow Inventory*, 23 Stan. Env't L.J. 131 (2004).

5 *See* Peter Andre, Teodora Boneva, Felix Chopra & Armin Falk, *Misperceived Social Norms and Willingness to Act Against Climate Change* 2 (Sustainable Architecture for Fin. in Eur., Working Paper No. 414, 2024), https://ssrn.com/abstract=4740469 [https://perma.cc/WBC8-Q7HV] (concluding that 79% of Americans think the U.S. should fight climate change); *contra* Anthony Leiserowitz et al., Climate Change in the American Mind: Beliefs & Attitudes, Fall 2024 3, https://climatecommunication.yale.edu/publications/climate-change-in-the-american-mind-beliefs-attitudes-fall-2024/ [https://perma.cc/8RPY-R87U] (finding 64% of Americans are at least "somewhat worried" about climate change).

6 *See* Exec. Order No. 14,162, 90 Fed. Reg. 8455 (Jan. 20, 2025) (removing the U.S. from the Paris Agreement); Exec. Order No. 14,154, 90 Fed. Reg. 8353 (Jan. 20, 2025) ("[pausing] disbursement of funds appropriated through the Inflation Reduction Act of 2022 or the Infrastructure Investment and Jobs Act").

7 *See* discussion *infra* Parts II and III.

8 *See, e.g.*, Sander van der Linden, Foolproof: Why Misinformation Infects Our Minds and How to Build Immunity (2023) (demonstrating the extent of misinformation at the global level and ways to counteract it); Michael P. Vandenbergh, *Environmental Law in a Polarized Era*, 38 J. of Land Use & Env't L. 1, 10–14 (2023) (examining the implications of misinformation, polarization, sorting, and gridlock for environmental law).

about the goals of environmental protection and the level of progress toward achieving those goals, it is unrealistic to assume that the public and environmental decision-makers will have the information and incentives necessary to align environmental law and policy with the public's long-term interests. Information alone is not a panacea, but the Article demonstrates how information about environmental risks and the processes used to develop the information can build public support for environmental protection, improve rational environmental decisionmaking, and reduce the harms arising from the new, more virulent form of democracy deficit.

The need for feasible instruments to bypass polarization and gridlock has never been greater. Environmental policy in the U.S. has been slow to respond to the urgent need for substantial, prompt action as new problems have arisen ranging from new forms of toxic chemicals to the threat of greenhouse gases.[9] For instance, based on the current and projected volume of carbon emissions, the globe is likely to surpass the global carbon budget before 2030.[10] Even if every nation adheres to its current conditional and non-conditional Paris Agreement targets, CO_2 emissions by 2030 will still exceed a 2.7°F (1.5°C) warming trajectory by 19 Gigatons (Gt).[11] This is equivalent to the annual emissions of nine of the top ten emitting countries.[12] Reconnecting with the 2.7° pathway

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9 *See* Joshua A. Basseches et al., *Climate Policy Conflict in the U.S. States: A Critical Review and Way Forward*, 170 Climatic Change 32 (2022), https://link.springer.com/10.1007/s10584-022-03319-w [https://perma.cc/2BUT-PUDV]; Michael P. Vandenbergh, *Private Environmental Governance*, 99 Cornell L. Rev. 129 (2013); Matthew G. Burgess et al., *Supply, Demand and Polarization Challenges Facing U.S. Climate Policies*, 14 Nature Climate Change 134 (2024), https://www.nature.com/articles/s41558-023-01906-y [https://perma.cc/XUH6-4AYD], all of which detail the lack of actionable environmental policy in the U.S. over the three decades.

10 Robin D. Lamboll et al., *Assessing the Size and Uncertainty of Remaining Carbon Budgets*, 13 Nature Climate Change 1360 (2023), https://www.nature.com/articles/s41558-023-01848-5 [https://perma.cc/QK89-G73V].

11 U.N. Env't Programme, Emissions Gap Report 2023: Broken Record – Temperatures Hit New Highs, yet World Fails to Cut Emissions (Again) (2023), https://wedocs.unep.org/20.500.11822/43922 [https://perma.cc/P5JE-94TA]. This is corroborated by U.N. Framework Convention on Climate Change, First Global Stocktake 4 (2023), https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf [https://perma.cc/69QT-3S5X], which finds that, assuming all contributions are fully realized by 2030, emissions are set to decrease by 5.3% relative to 2019 levels, compared to the 43% reduction needed to maintain <50% chance of exceeding 1.5° warming. According to U.N. Framework Convention on Climate Change Secretariat, Nationally Determined Contributions under the Paris Agreement 13 (2021), https://unfccc.int/documents/306848 [https://perma.cc/7WU7-XW35], 2019 emissions were 52.4 GT CO_2e, leaving a 19.75 GT gap between projected and needed reductions.

12 M. Crippa et al., *GHG Emissions of All World Countries – 2024* (2024), https://edgar.jrc.ec.europa.eu/report_2024 [https://perma.cc/HVY2-AFHD]. These countries include the United States, India, Russia, Brazil, Indonesia, Japan, Iran, Saudi Arabia, and Canada.

would require countries to cut annual emissions by over 10% through 2030 and 6.6% between 2030 and 2035.[13]

During the Biden administration, Congress responded to the climate threat by adopting beneficiary pays legislation such as the Inflation Reduction Act ("IRA")[14] and the Infrastructure Investment and Jobs Act ("IIJA"),[15] but it was unable to adopt major polluter pays legislation such as a carbon tax or new statutory language authorizing major new regulatory measures.[16] Following the 2024 election, Congress may scale back the IRA and IIJA incentives,[17] and the pendulum of White House political support for executive branch action on climate change and other issues will swing back toward the promotion of fossil fuels.[18] Even if White House control shifts in four years, recent Supreme Court decisions will handcuff federal agencies' attempts to interpret their existing statutory authorities to address new and existing threats. For instance, the *Sackett v. Environmental Protection Agency* decision removed federal protection for roughly half of the wetlands in the United States, while the *Loper Bright*, *Jarkesy*, *Federal Reserve*, and *Ohio v. EPA* cases have constrained agencies' ability to use their rulemaking and administrative enforcement tools for environmental protection.[19]

Importantly, the social science literature suggests that multi-scalar informational efforts could address some of the challenges associated with U.S. climate and environmental governance. These include

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13 U.N. Framework Convention on Climate Change, First Global Stocktake, *supra* note 11, at 5 finds that a 43% reduction by 2030, and a 60% reduction by 2035, of global emissions relative to 2019 levels is necessary to maintain <50% chance of exceeding 1.5° warming. If reductions do not begin until 2025, countries will need to emit 10.64% less each year between 2025-2030. This is based on the average rate of change needed to see a 43% decrease over a five-year period from 2025 to 2030.

14 H.R. 5376, 117th Cong. (2022).

15 Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021).

16 S. 5054, 118th Cong. (2024). The Polluters Pay Climate Fund Act of 2024 would have established a carbon tax levied against fossil fuel companies.

17 House Budget Comm., Reverse the Curse: U.S. House Budget Resolution (FY25-FY34) 21 (2025).

18 *See, e.g.*, Exec. Order No. 14,154, 90 Fed. Reg. 8353 (Jan. 20, 2025) ("unleashing" U.S. oil and gas production); Exec. Order No. 14,156, 90 Fed. Reg. 8433, 8436 (declaring a national energy emergency and defining energy as "crude oil, natural gas, lease condensates, natural gas liquids, refined petroleum products, uranium, coal, biofuels, geothermal heat, the kinetic movement of flowing water, and critical minerals.").

19 *See* Sackett v. EPA, 598 U.S. 651 (2023); Loper Bright Enters. v. Raimondo, 603 U.S. 369 (2024); SEC v. Jarkesy, 603 U.S. 109 (2024); Corner Post, Inc. v. Bd. of Governors, 603 U.S. 799 (2024); Ohio v. EPA, 603 U.S. 279 (2024).

regional,[20] state,[21] local,[22] and public-private initiatives[23] that assess environmental risks and responses–efforts that have been particularly influential regarding climate change.[24] In addition to filling gaps in federal environmental governance, research suggests that climate mitigation and adaptation processes are growing increasingly collaborative and multi-networked, using bottom-up processes in which public and private actors from various sectors collaborate to implement cross-cutting solutions.[25] These processes involve not only pollution control initiatives, but also information-driven efforts, and these informational efforts can fill gaps in the federal government's ability to build public support and provide the data necessary to drive rational allocation of environmental resources. The Article argues that these regional, state, and local processes can benefit from a process called embedded upscaling, by which communities learn from other communities and develop the capacity to catch up to their leading counterparts.[26]

For decades, the federal government mandated reports of data-driven indicators of environmental problems and policymaking progress. More specifically, between 1970 and 1997, the White House Council on Environmental Quality ("CEQ") implemented Section 201 of the National Environmental Policy Act of 1969 by submitting annual reports (often called "State of the Environment", or "SOE" reports) to the President and Congress. The SOE reports assessed environmental risks, projected trends, and provided recommendations for federal environmental policy.[27]

This Article examines whether regional, state, and local annual SOE reports that are developed through collaborative processes can

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20 *See Welcome to WESTCARB!*, W. Coast Reg'l Carbon Sequestration P'ship, https://www.westcarb.org/ [https://perma.cc/Q3P5-TQ2R]; *Welcome*, Reg'l Greenhouse Gas Initative, https://www.rggi.org/ [https://perma.cc/MK5G-96QF].

21 *See State Adaptation Progress Tracker*, Geo. Climate Ctr., https://www.georgetownclimate.org/adaptation/plans.html [https://perma.cc/GDT2-GG2J].

22 *See Our Member Cities*, Resilient Cities Network, https://resilientcitiesnetwork.org/member-cities/ [https://perma.cc/WVS4-UFYJ].

23 *See* Hamid Samandari et al., The Role of Public–Private– Philanthropic Partnerships in Driving Climate and Nature Transitions (2023), https://www.mckinsey.com/capabilities/sustainability/our-insights/the-role-of-public-private-philanthropic-partnerships-in-driving-climate-and-nature-transitions#/ [https://perma.cc/6PR4-9HMN] (for case studies of and a framework for public-private climate partnerships).

24 Carter B. Casady et al., *Public-Private Partnerships for Low-Carbon, Climate-Resilient Infrastructure: Insights from the Literature*, 470 J. Cleaner Prod. 1 (2024).

25 Alexander Aylett, *Institutionalizing the Urban Governance of Climate Change Adaptation: Results of an International Survey*, 14(1) Urb. Climate 4 (2015).

26 Harald Fuhr, Thomas Hickmann & Kristine Kern, *The role of cities in multi-level climate governance: Local climate policies and the 1.5 °C target*, 30 Current Op. Env't Sustainability 1 (2018).

27 *Annual Environmental Quality Reports*, Nat'l Env't Pol'y Act, https://ceq.doe.gov/ceq-reports/annual_environmental_quality_reports.html [https://perma.cc/R9NB-7EMX].

reduce the harms arising from the modern democracy deficit at the federal level. It explores whether SOE reports can do so by providing transparent, region-specific information on the most critical environmental risks and on progress indicators, as well as through the robust environmental stakeholder engagement processes that can be used to develop these reports. In Parts II and III, we outline the history of SOE reports in the US, and we explore the value of providing timely and specific environmental information to regional, state, and local stakeholders. In Part IV, we present a new case study demonstrating how a collaborative process produced an annual SOE report that identifies environmental risks and progress indicators for one region. We conclude by illustrating how these reports and the processes for developing them can be replicated in other regions, states, and localities, and how this effort can contribute to addressing the environmental democracy deficits of the modern era.

I. The Role and History of State of the Environment Reports

Pursuant to Section 201 of the National Environmental Policy Act ("NEPA"), for many years the federal government prepared and distributed assessments of national environmental quality to U.S. stakeholders through annual SOE reports prepared by the CEQ.[28] The reports were used by Congress, agencies, NGOs, and private sector actors to assess environmental quality trends and allocate resources for environmental protection and natural resources management.[29] The inaugural CEQ SOE report included a statement from President Richard M. Nixon noting that the CEQ had assembled "in one comprehensive document a wealth of facts, analyses, and recommendations . . . of our most pressing environmental challenges," and concluding that the report would help to clarify "for a broad public what those challenges are and where the principal dangers lie."[30] In short, the SOE report would help establish "the directions in which we must move as rapidly as circumstances permit."[31]

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28 National Environmental Policy Act of 1969, Pub. L. No. 91-190, § 201, 83 Stat. 852 (1970) (amended by Fiscal Responsibility Act of 2023, Pub. L. No. 118-5, §§ 102, 106–11, 321, 137 Stat. 10 (2023)) requires the President to submit to Congress an annual Environmental Quality Report. The CEQ interpreted enactment of the Federal Reports Elimination and Sunset Act, Pub. L. No. 104-66 to require discontinuation of the annual Environmental Quality Report.

29 Healy, *infra* note 67.

30 Council on Env't Quality, The First Annual Report of the Council on Environmental Quality vi (1970), https://www.slideshare.net/whitehouse/august-1970-environmental-quality-the-first-annual-report-of [https://perma.cc/Y5G6-KBCZ].

31 *Id.* at xiv.

The reports were widely read by many government officials, industry members, and NGOs. A leading 1981 assessment of the report's efficacy concluded it was a "timely, readable, informative, and accurate" review to inform environmental decision-making.[32] Similarly, readers interviewed for the 1981 review considered its continuation "of national importance for many years to come."[33] The CEQ publicly released these reports annually between 1970 and 1997.[34]

In an era of skepticism about federal agencies following Rep. Newt Gingrich's elevation to Speaker of the House of Representatives in 1995, however, the new Republican majority implemented the "Contract with America," which included paperwork reduction provisions.[35] Facing pressure from Congress to reduce the number of government reports, the CEQ concluded that the annual SOE reports were subject to the Federal Reports Elimination and Sunset Act of 1995 (S. 790) and halted production of the reports after 1997.[36] In his floor statement on the bill, Sen. John McCain noted his and his co-sponsors' concern about the cost and volume of mandatory reports to Congress that they believed to be "reaching truly epic proportions of unnecessary and wasteful paper shuffling."[37] The authors sought to "reduce the paperwork burdens placed on Federal agencies, streamline the information that flows from these agencies to the Congress, and save millions of taxpayers' dollars."[38] The relevant language in the Act states that "any annual, semiannual, or other regular periodic report specified … shall cease to be effective … 4 years after the date of the enactment of this Act."[39] This placed the onus upon the House and President to compile a list of "wasteful" periodic reports.[40]

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32 Gen. Acct. Off., *The Council on Environmental Quality: A Tool In Shaping National Policy* 14 (1981), https://www.gao.gov/assets/ced-81-66.pdf [https://perma.cc/WY3L-SYPT].

33 *Id.* at 17.

34 Federal Reports Elimination and Sunset Act of 1995, S. 790, 104th Cong. (1995), https://www.congress.gov/bill/104th-congress/senate-bill/790 [https://perma.cc/8F7P-FJ9M].

35 Job Creation and Wage Enactment Act of 1995, H.R. 9, 104th Cong. (1995); *see also* Newt Gingrich & Dick Armey, The Republican "Contract with America" (1994), https://global.oup.com/us/companion.websites/9780195385168/resources/chapter6/contract/america.pdf [https://perma.cc/Z4W5-H49X].

36 *Information & Resources*, White House, https://www.whitehouse.gov/ceq/information-resources/#:~:text=CEQ%20published%20these%20%E2%80%9Creports%E2%80%9D%20from,103%2D7; *see also* Federal Reports Elimination and Sunset Act of 1995, S. 790, 104th Cong. (1995).

37 141 Cong. Rec. S6513 (1995), https://www.congress.gov/104/crec/1995/05/11/141/78/CREC-1995-05-11-pt1-PgS6513-2.pdf [https://perma.cc/PSL3-LCXP].

38 *Id.* at S6515.

39 *See* Federal Reports Elimination and Sunset Act of 1995, S. 790, 104th Cong. § 3003(a)(1) (1995).

40 *See id.* at § 3003(b)–(c). *See also* H.R. Doc. No. 103-7 (1993), https://budgetcounsel.com/wp-content/uploads/2016/10/house-document-no-103e280937-31usc1113.pdf [https://perma.cc/94TH-7XVB].

But was it "wasteful" to prepare an annual report on trends in environmental conditions if that report could reduce federal environmental costs by ensuring more efficient targeting of federal resources? The CEQ SOE reports arguably fall under the statutory language of the Federal Reports Elimination and Sunset Act.[41] Even so, terminating the reports eliminated a source of information that could have reduced waste by informing the public, the media, and other decision-makers about the principal national environmental risks and progress toward addressing them.[42] In the absence of the annual SOE report, no single source provides an overview of the national status and trends.[43] Although decentralized environmental reporting within government agencies has filled the gap, its results are likely less accessible to the public, less efficient, and more siloed in their presentation of information.

Although the argument could be made that not terminating the SOE reports under the Federal Reports Elimination and Sunset Act would waste less federal resources, Congress and the White House are unlikely to revisit the value of the SOE reports anytime soon. Similar environmental reports continue to be released in other countries,[44] and several U.S. government agencies and NGOs have continued, at least until recently, to generate important periodic reports for specific environmental challenges,[45] including the climate reports of the U.S. Global

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41 *See* Michael P. Vandenbergh & Jonathan A. Gilligan, *Macro-Risks: The Challenge for Rational Risk Regulation*, 21 Duke Env't L. & Pol. F. 401, 429 (2011).

42 *Id.*

43 *Id.* (the United States eliminated the SOE report in 1996).

44 *See id.*; *Environmental Statement 2022*, Eur. Env't Agency (2023), https://www.eea.europa.eu/en/analysis/publications/environmental-statement-report-2022 [https://perma.cc/V9Y5-ZELD]; *Annual Report on the Environment in Japan 2023*, Ministry of the Env't (2023), https://www.env.go.jp/content/000175165.pdf [https://perma.cc/ZNT6-H8UB]; *Environmental Accounts Statistics 2023*, Nat'l Stats. Bureau of the Royal Gov't of Bhutan (2023), https://www.nsb.gov.bt/publications/annual-environmental-accounts-statistics/ [https://perma.cc/TB6V-R8CX]; *Annual Report to Parliament for April 2021 - March 2022*, Ministry of Env't & Climate Change Canada (2023), https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/annual-report-2021-2022.html [https://perma.cc/PKP2-HN6A]; *Annual Report 2022/2023*, Dep't of Forestry, Fisheries, & the Env't of the Republic of S. Afr. (2023), https://www.dffe.gov.za/sites/default/files/reports/annualreport202223.pdf [https://perma.cc/7BUX-26DU].

45 *See generally Annual Site Environmental Reports (ASER) Links*, U.S. DOE Off. of Env't, Health, Safety, and Sec., https://www.energy.gov/ehss/annual-site-environmental-reports-aser-links [https://perma.cc/2SME-CZ3B] for links to all available annual environmental reports from DOE sites; *State of Our State*, ThinkTennessee (2023), https://www.thinktennessee.org/state-of-our-state/ [https://perma.cc/W22N-XTVN] for a repository of annual reports on several key policy areas at the state level; or *WWF and Bolton Foods: Partnership Progress Report 2023*, World Wildlife Found. (2024), https://wwfint.awsassets.panda.org/downloads/def_bolton_wwf_report_2023_final-2-maggio.pdf https://perma.cc/X96W-EJ5D] for an annual environmental report published by Bolton Foods, one of the world's largest seafood companies, with support from WWF.

Climate Research Program ("U.S. GCRP"),[46] but the CEQ no longer produces an equivalent to the federal annual SOE report. The specialized reports provide value by identifying risks and measuring progress on specific environmental topics, but many are being eliminated by the new administration and their limited topical scope often reduces their ability to provide the public and decision-makers with comprehensive information across multiple environmental issues.

The national response to environmental threats is thus proceeding now without a comprehensive, accurate basis for rational resource allocation and coordinated policy responses across all major environmental topics and regions. In light of the public's consistent demand for environmental quality, which has continued despite inconsistent federal support for environmental protection, this Article suggests that it is time to revisit whether preparation of regional, state, and local SOE reports could fill this gap in the federal environmental protection system.

II. The Role of Public Information in Environmental Governance

A substantial literature examines the roles that information plays in steering environmental protection at a global, national, agency, company, facility, project, and product level.[47] For many years, the CEQ SOE reports provided global- and national-level information on environmental conditions and trends designed to facilitate public understanding of environmental issues and rational environmental decision-making by government, private, and community-level stakeholders. Part II describes the multiple stakeholders who might benefit from annual regional, state, and local SOE reports.

A. Public Stakeholders

The CEQ's principal target audiences for its SOE reports were federal government agencies, Congress, the media, and the public. The SOE reports addressed the most important environmental issue areas and were designed to promote interagency cooperation and collaboration.[48] In the first decade of their publication, the SOE reports helped

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46 *See, e.g.*, U.S. Global Change Rsch. Program, Our Changing Planet: The U.S. Global Change Research Program for Fiscal Year 2024 (2024), https://doi.org/10.7930/ocpfy2024 [https://perma.cc/8QKR-D76X].

47 *See* Esty, *supra* note 1; Wesley A. Magat & W. Kip Viscusi, Informational Approaches to Regulation (1992); Michael P. Vandenbergh & Jonathan M. Gilligan, Beyond Politics: The Private Governance Response to Climate Change 177–244 (2017).

48 Richard Nixon, Message to the Congress Transmitting the First Annual Report of the Council on Environmental Quality (Aug. 10, 1970) ("We need new knowledge, new perceptions, new attitudes – and these must extend to all levels of government and throughout the private sector as well: to industry; to the professions; to each individual citizen in his job and in his home").

to lay the groundwork for the Toxic Substances Control Act of 1976 ("TSCA") and the federal rules regarding invasive species.[49] Furthermore, given the location of the CEQ within the White House, the SOE reports had substantial soft power with federal agencies, which enabled the information in the reports to "cut across agency lines."[50] Although the importance of this soft power is easily dismissed, interagency collaboration is surprisingly important for environmental protection at the federal, state, and local levels, and it is a priority for effective policymaking in areas ranging from public health to national security.[51]

The U.S. federal system also relies on state and local governments at all levels for environmental regulation and oversight. The absence of information about the most important environmental risks and indicators of progress toward addressing them remains a significant gap in climate and other environmental governance,[52] and the value of national and subnational participation in data gathering has been identified in international law and by scholars worldwide.[53] State and local governments can augment federal disclosures using SOE reports that identify the specific threats and opportunities within their jurisdictions.[54] Regional, state, and local coordination regarding data gathering and

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49 *See* Exec. Order No. 11,987, 42 Fed. Reg. 26949 (1977). The Global 2000 Report to the President (1980) included two volumes; the first was a "study of the probable changes … to the end of the century," and the second the "foundation of [the Federal Government's] longer term planning." *See* Gerald O. Barney, The Global 2000 Report to the President of the U.S.: Entering the 21st Century, Volume I: The Summary Report 273 (1980), https://archive.org/details/global-2000report0001coun/page/n7/mode/2up [https://perma.cc/5J4N-2ET5].

50 Gen. Acct. Off., *supra* note 32, at 12.

51 *National Security, Interagency Collaboration, and Lessons from SOUTHCOM and AFRICOM*: *Hearing Before the H. Comm. on Oversight and Gov. Reform*, 111th Cong. (2010) (statement of Thomas Countryman), https://www.govinfo.gov/content/pkg/CHRG-111hhrg64927/html/CHRG-111hhrg64927.htm [https://perma.cc/7JBW-D48X]; Ijeoma Nwabuzor Ogbonnaya & Annie J. Keeney, *A Systematic Review of the Effectiveness of Interagency and Cross-System Collaborations in the United States to Improve Child Welfare Outcomes*, 94 Child. & Youth Servs. Rev. 225 (2018), https://www.sciencedirect.com/science/article/pii/S0190740918304997 [https://perma.cc/74CA-4GJL].

52 Clifford Rechtschaffen & David L. Markell, *Improving State Environmental Enforcement Performance through Enhanced Government Accountability and Other Strategies*, 33 Env't L. Rep. News & Analysis 10559 (Aug. 2003).

53 *See* U.N. Conference on Environment and Development, *Agenda 21*, U.N. Doc. A/CONF. 151/26 (Vol. III), (June 3–14, 1992); *see also*, Liberty Kudzai Masekesa, *A Human Rights-Based Approach to Implementing Target 11.6 of Sustainable Development Goal 11 in Zimbabwe*, 22 Afr. Hum. Rts. L.J. 241 (2022); Frances Irwin & Carl Bruch, *Information, Public Participation, and Justice*, 32 Env't L. Rep. News & Analysis 10784 (July 2002); Ian Clyde, *Ignorance is Not Bliss: The Importance of Environmental Information*, 2 Asia Pac. J. Env't L. 253 (1997); Douglas A. Kysar & James Salzman, *Making Sense of Information for Environmental Protection*, 86 Tex. L. Rev. 1347 (June 2008).

54 Christine Gregoire, *A Washington Innovation: Environment 2010*, 22 Env't L. 301, 303–04 (1992).

publication may also better enable government agencies at all levels to prioritize and manage their monitoring and enforcement efforts.

B. Private Stakeholders

Reports identifying trends in environmental conditions and emissions can also affect private sector actors' environmental decision-making, much of which is increasingly occurring absent government control or coordination. For instance, despite congressional gridlock preventing federal requirements for climate mitigation, carbon taxing, or cap-and-trade legislation, two-thirds of global Fortune 500 companies have made "net zero" or other climate mitigation commitments.[55] Because private actors are subject to pressure from customers, employees, investors and others but are not subject to the hurdles facing new federal legislation, they can in some cases respond to environmental threats more rapidly than their public counterparts.[56] These kinds of climate and other environmental commitments are subject to greenwashing risks and are not complete solutions, but they are filling some gaps in public governance.[57] If greenwashing can be minimized, these private environmental governance ("PEG") actions can be particularly valuable for climate change and other environmental threats that require prompt, major actions. PEG actions are also significant when the Supreme Court, Congress, and the White House have handcuffed federal agencies' environmental protection options, such as those that occurred with wetlands after *Sackett v. EPA*.[58]

Multi-scalar, well-tailored information also has the potential to drive PEG initiatives that can have cascading effects, such as improving supply chain sustainability to mitigate Scope 1, 2, and 3 emissions. For instance, Walmart's Project Gigaton reduced, avoided, or sequestered one billion metric tons of CO_2e from its supply chain between

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55 Climate Impact Partners, *Commitment Issues: Markers of Real Climate Action in the Fortune Global 500* (Sept. 2023), https://info.climateimpact.com/hubfs/ClimateImpactPartners_FortuneGlobal500_2023_FINAL.pdf [https://perma.cc/H6XJ-GJAU].

56 *See* Michael P. Vandenbergh & Jonathan M. Gilligan, *Beyond Gridlock*, 40 Colum. Env't L.J. 217, 301–03 (2015).

57 *See* Amanda Shanor & Sarah E. Light, *Greenwashing & the First Amendment,* 122 Colum. L. Rev. 2033 (2022); Shelley Welton, *Neutralizing the Atmosphere*, 132 Yale L.J. 171 (2022); Oren Perez & Michael P. Vandenbergh, *Making Climate Pledges Stick: A Private Ordering Mechanism for Climate Commitments*, 50 Ecology L. Q. 683 (2023).

58 *See, e.g.*, Michael P. Vandenbergh et al., *Filling the* Sackett *Gap: The Private Governance Option* (Vand. Univ. L. Sch., Working Paper No. 24-20, 2024) (noting the role that supply chain contract, investor, and lender pressure can protect wetlands after *Sackett*); Michael P. Vandenbergh, *Private Environmental Governance*, 99 Cornell L. Rev. (2013) (noting the gap-filling role of private environmental governance); Maria C. Lemos & Arun Agrawal, *Environmental Governance*, 31 Ann. Rev. Env't Res. 297 (2006), https://www.annualreviews.org/doi/10.1146/annurev.energy.31.042605.135621 [https://perma.cc/MDU7-EQUX].

2017-2023 – equivalent to eliminating all of the CO_2e emissions from France, the Philippines, and the United Kingdom in 2023.[59] These efforts were conducted with the involvement of major environmental advocacy groups, so the risks of greenwashing were reduced. Although many types of incentives may drive corporate behavior, many private entities have demonstrated motivation to adopt environmental policies. This would reduce their risk of future losses from the physical and economic risks posed by climate change and address the increasing number of consumers, employees, investors, lenders, and community stakeholders who support environmental protection.[60]

Publicly available reports that disclose environmental information can boost awareness of a firm's inefficiencies, challenges, and opportunities, allowing them to improve internal standards.[61] Moreover, information sharing can help overcome information siloes that limit organizational sustainability.[62] Finally, localized reporting can improve a firm's community outreach by highlighting the specific problems facing the areas in which they operate.[63]

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59 Kathleen McLaughlin, *Walmart Suppliers Lead the Charge, Help Deliver Project Gigaton Goal More Than Six Years Early*, Walmart (Feb. 21, 2024), https://corporate.walmart.com/news/2024/02/21/walmart-suppliers-lead-the-charge-help-deliver-project-gigaton-goal-more-than-six-years-early [https://perma.cc/43QF-C2EG]. Crippa et al., *supra* note 12.

60 Kavita Sharma, Chandni Aswal & Justin Paul, *Factors Affecting Green Purchase Behavior: A Systematic Literature Review*, 32 Bus. Strategy Env't 2078 (2023), https://onlinelibrary.wiley.com/doi/10.1002/bse.3237 [https://perma.cc/FA8R-2LY7] provides a literature review of the variety of factors that impact Green Purchase Intention, Green Purchase Behavior, and the Intention-Behavior Gap. They found that, while price was an important factor for minimizing the Gap, there still appeared to be some relationship between a product's perceived sustainability and consumer willingness to pay a premium.

61 Mark Stephan, *Environmental Information Disclosure Programs: They Work, but Why?*, 83 Social Sci. Q. 190 (2002), https://www.jstor.org/stable/42956281 [https://perma.cc/X989-G27R] explains several ways in which public environmental information campaigns encourage firm-level changes. *See also* Daqian Shi et al., *Deterrence Effects of Disclosure: The Impact of Environmental Information Disclosure on Emission Reduction of Firms*, 104 Energy Econ. 105680 (2021), https://linkinghub.elsevier.com/retrieve/pii/S0140988321005363 [https://perma.cc/9BBR-75CJ]; Nan Li et al., *Information Disclosure, Coal Withdrawal and Carbon Emissions Reductions: A Policy Test Based on China's Environmental Information Disclosure*, 13 Sustainability 9758 (2021), https://www.mdpi.com/2071-1050/13/17/9758 [https://perma.cc/EE7B-LEPT]; Rongbing Huang & Danping Chen, *Does Environmental Information Disclosure Benefit Waste Discharge Reduction? Evidence from China*, 129 J. Bus. Ethics 535 (2015), http://link.springer.com/10.1007/s10551-014-2173-0 [https://perma.cc/Q89V-4EKP], all of which found significant reductiosn in firm-level emissions following the annual release of China's Pollution Information Transparency Index – a measure intended to assess and publicize major sources of emissions in the country.

62 André de Waal et al., *Silo-Busting: Overcoming the Greatest Threat to Organizational Performance*, 11 Sustainability 6860 (2019), https://www.mdpi.com/2071-1050/11/23/6860 [https://perma.cc/V7F4-4GBP].

63 Ivan Nechaev & Daniel S. Hain, *Social impacts reflected in CSR reports: Method of extraction and link to firms innovation capacity*, 429 J. of Cleaner Prod. 139256 (2023), https://www.sciencedirect.com/science/article/pii/S0959652623034145 [https://perma.cc/6Y6N-LAAQ].

C. Community-level Stakeholders

U.S. communities have used environmental indicators to organize, generate conversation, and demand change to address a wide range of environmental threats. For instance, a 1983 study by the U.S. General Accounting Office affirmed the experiences of low-income families disproportionately exposed to landfills in Warren County, North Carolina.[64] The report, which identified the inequitable siting of landfills in low-income, predominantly Black communities, prompted a more extensive national study on hazardous waste siting patterns and is often credited with launching the environmental justice movement.[65] These environmental and social indicators were also integrated into the CEQ SOE reports.[66] Assessing environmental quality and its disproportionate effects on communities proved critical to affirming lived experiences, catalyzing local change, and affecting inter- and intra-agency practices.

III. Case Study: A Regional, State, and Local State of the Environment Report and Event

Part III uses a recent case study to examine how a regional, state, or local SOE report and process can provide valuable information to assist public and private environmental decision-makers and increase public participation and information in ways that can reduce the democracy deficit facing environmental protection. Given the wide range of stakeholders involved in regional environmental governance, we created a collaborative process for generating and maintaining an annual SOE report for Tennessee, with an eye toward regional, state, and local environmental governance. Our approach demonstrated that it is possible to develop data-driven indicators for decision-making, and open-source, publicly available data sources can provide invaluable insights at several geographic scales. The approach also demonstrated that information about local governance issues could encourage community participation in regulatory processes and that meaningful engagement with

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64 Gen. Acct. Off., Siting of Hazardous Waste Landfills and Their Correlation with Racial and Economic Status of Surrounding Communities (1983), https://www.gao.gov/products/rced-83-168 [https://perma.cc/4HZY-F5T5].

65 United Church of Christ Comm'n for Racial Just., Toxic Wastes and Race in the United States: A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites (1987), https://www.ucc.org/wp-content/uploads/2020/12/ToxicWastesRace.pdf [https://perma.cc/5G8V-6UQJ].

66 Julian Agyeman et al., *Trends and Directions in Environmental Justice: From Inequity to Everyday Life, Community, and Just Sustainabilities*, 41 Ann. Rev. Env't Res. 321 (2016), https://www.annualreviews.org/doi/10.1146/annurev-environ-110615-090052 [https://perma.cc/W3BN-PG6Z]; Council on Env't Quality, The Second Annual Report of the Council on Environmental Quality (1971), https://www.slideshare.net/whitehouse/august-1971-the-first-annual-report-of-the-council-on-environmental-quality [https://perma.cc/M39T-DRPJ].

stakeholders across the political spectrum has the potential to decrease polarization on environmental challenges.

Part III details the data-driven approach we used to generate critical information and to prompt regional environmental policy conversations among public and private stakeholders, students, and professors. In addition to describing the process for creating the annual SOE report, we discuss an annual conference that provided the public and decision-makers with information about the results of the report and an opportunity to help shape it.

A. Report Content: Data-Driven Priorities

The CEQ annual reports were designed to be an "authoritative and comprehensive analysis, usually statistically based, of environmental conditions and trends within a specified geographic territory,"[67] and the Tennessee SOE report shared these goals. The initial Tennessee SOE report is included as Appendix A, and it provides a replicable, updatable, and open-source analysis on environmental issues. The report provides data and analysis on the current status of issues that environmental experts in the region identified as the most important, such as land use trends, changes in emissions, projected per-capita emissions, energy costs and burdens, transportation emissions, drinking water violations, impaired waterways, and flood risks. To enhance accountability and build credibility, the Tennessee SOE report relies on transparent sources and processes. For instance, the report includes only public data sources for statements about the status of key issues and identifies the sources for those statements (e.g., Table 1, Appendix A).

The Tennessee SOE report also includes a discussion of the challenges and opportunities for each environmental topic, and the report's creation provided an opportunity to involve students from across the campus to contribute data analyses and supporting code for the report.[68] Because the report used publicly available national datasets and open-source software, other academic institutions, non-profit groups, and government agencies can replicate this experiential learning approach to improve stakeholder engagement on environmental governance challenges at the regional, state, and local levels.[69]

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67 Robert G. Healy, *"State of the Environment" Reports*, 2 J. of Plan. Literature 262, 263 (1987).

68 Mariah D. Caballero et al., Tennessee State of the Environment Report (2024), https://cdn.vanderbilt.edu/vu-sub/wp-content/uploads/sites/281/2025/02/06104357/2024-State-of-the-Environment-Report.pdf [https://perma.cc/P78P-QR6V].

69 Data purges from government sources have presented an unforeseen challenge to this type of reporting. Private data rescue efforts have saved many of the now-deleted sources, but discontinuing important research will have its own implications. The tendency to restrict public access to data has grave consequences for rational governance, especially when combined with

Table 1. Section, Environmental Assessment, and Publicly Available Data Sources Used to Compile the Tennessee State of the Environment Report.[70]

Section	Environmental Assessment	Data Source
Conservation	Change in land use type, 2001–2021	National Land Cover Database
Climate	Percent change in gross emissions relative to 1990 levels, 1991–2021	USEPA Greenhouse Gas Inventory
	Emissions by sector, 1990–2021	US Energy Information Agency (EIA) State Energy Data System
Energy	Percent of electricity production from non-carbon sources, 1990–2022	U.S. Energy Information Agency (EIA) State Energy Data System
	Projected per capita emissions (tons CO2), 2022–2050	U.S. Energy Information Agency (EIA) Regional Energy Outlook
	Change in total energy production and energy production as a proportion of total energy production by source, 1960–2021	U.S. Energy Information Agency (EIA) State Energy Data System
	Average Annual Household Energy Costs and Energy Burden	U.S. DOE Low-Income Energy Affordability (LEAD) Tool
Air	Average PM 2.5 levels by population density	USEPA EJScreen tool
	Transportation emissions, measured as the tons of Carbon Dioxide (CO2) per resident emitted on-road in 2017	ORNL DARTEv2 (Database of Road Transportation Emissions), FHWA HPMS, American Census Bureau
	Average air pollution emissions from transportation in tons per capita by state stratified by state electric vehicle (EV) uptake	U.S. DOE, USEPA, U.S. Census Bureau

funding cuts for publicly and privately conducted research that might be able to fill some of the gaps. *See e.g.*, Data Rescue Project (2025), https://www.datarescueproject.org/ [https://perma.cc/UCM5-WXHK].

70 Caballero et al., *supra* note 68.

Section	Environmental Assessment	Data Source
Water	Percentage of Community Water Systems (CWS) with one or more health-based violations, 2018–2022	EPA Enforcement and Compliance History Online (ECHO) Tool
	Number of rivers, streams, and lakes that exceeded at least one benchmark for concentration of toxic materials or received at least one "Poor" grade	National Aquatic Resources Surveys
	Percentile-ranked share of properties at risk of flood in 30 years and low-income tracts at disproportionate risk.	Climate and Economic Justice Screening (CEJST) Tool
Waste	Total waste	Tennessee Division of Solid Waste Management
		Environmental Protection Agency Greenhouse Gas Inventory Data
	Toxic releases by state, 2022	Toxic Releases Inventory Basic Data Files
	Concentration of harmful chemicals in drinking water samples, 2023–2024	EPA Fifth Unregulated Contaminant Monitoring Rule Data Finder

B. Stakeholder Information

The Tennessee SOE report summarizes environmental indicators at four geographic scales using entirely publicly available data. We used a multi-scalar approach to create environmental indicators that enable the public and policymakers to compare information at the national, regional, state, and local levels. This context is critical because many environmental indicators are made more meaningful when compared against additional context, such as national, regional, or state averages or medians. Doing so was difficult, however, because it often required aggregating data from the local (when applicable), state, U.S. Environmental Protection Agency ("EPA") region, and national level (see Appendix A). Our approach allowed us to make statements such as, "Davidson county residents emit 62.82% more [per-capita transportation emissions] than the national average, whereas the state of Tennessee and the Southestern region emit 16.17% and 7.43% more than the national average" (Table 2). These statements provided a transparent, comparable assessment of several indicators, providing foundational information for the public and environmental decision-makers. In the absence of this type of comparative information, it is very difficult for the public or decision-makers to know whether the region is over- or under-performing on environmental emissions and environmental quality issues.

Table 2. Example Excerpt from Tennessee State of the Environment Report. "Transportation Emissions, Measured as the Tons of CO_2 Per Resident Emitted On-Road in 2017, in the United States, the Southeastern Region, Tennessee, and Davidson County. Davidson County Residents Emit 62.82% More Than the National Average, Whereas the State of Tennessee and the Southeastern Region Emit 16.17% and 7.43% More Than the National Average."[71]

Geography	Total Emissions per year, tons	Average by area, tons/mi2/ year	Average by population, tons/per/ resident	% difference from national average
United States	1,747,657,704	460	5.38	--
Southeastern Region	378,679,522	959	5.76	7.43%
Tennessee	41,989,164	996	6.25	16.17%
Davidson County	6,026,327	11,566	8.76	62.82%

C. Democratic Engagement

The Tennessee SOE report is also drafted to reach a wide audience. It includes language designed to be as unbiased and nonpartisan as possible in its findings and suggestions. This approach is important because research suggests language and framing can generate ideological divisions on environmental issues, particularly climate change mitigation, and doing so can effectively restrict the readership to subsets of the population.[72]

The report also integrates consideration of equity and justice throughout all of its sections, such as disproportionate energy burdens, flood risks, air quality, and drinking water in historically underinvested communities (i.e., rural communities, low-income communities, and communities with greater proportions of people of color). The decision to integrate equity and justice discussions throughout the report ensured that readers could examine these issues not just in a single equity-focused section but in the context of a wide range of environmental indicators.

In addition to integrating environmental equity and justice indicators into the text, the report avoids passing judgment on past policy decisions and infrastructure choices. Instead, in an effort to avoid the polarization and gridlock that are common across a wide range of

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71 Caballero et al., *supra* note 68, at 15.

72 Lauren Feldman & P. Sol Hart, *Climate Change as a Polarizing Cue: Framing Effects on Public Support for Low-Carbon Energy Policies*, 51 Glob. Env't Change 54 (2018); Adrian Rinscheid et al., *What Shapes Public Support for Climate Change Mitigation Policies? The Role of Descriptive Social Norms and Elite Cues*, 5 Behav. Pub. Pol'y 503 (2020); Jennifer C. Cole et al., *Social Psychological Perspectives on Political Polarization: Insights and Implications for Climate Change*, 20 Persps. on Psych. Sci. 115 (2023).

climate and other environmental issues, the report frames current environmental indicators as a means to achieve an array of widely shared goals, such as shared land and wildlife conservation principles, sustainable development, and the importance of healthy environments for future generations.

D. Event Preparation

The 2024 Tennessee SOE report included in Appendix A is the product of extensive expert and public input and served as the basis for discussion and comment at a conference designed to be an annual event hosted by the Vanderbilt University Law School in Nashville, Tennessee. The State of the Environment Conference provided a day-long forum for discussion about the local, state, and regional environment among panelists and an audience that included policymakers, academics, practitioners, and students. It also provided a forum for intersectoral engagement as experts and lay audience members exchanged ideas about new local, state, and regional public and private environmental governance initiatives.

The report not only used publicly available data to visualize and discuss information on conservation, climate, energy, air, water, and waste at the county, state, U.S. EPA region, and U.S. geographic levels (Table 1), but also involved extensive participation by the local community as well as undergraduate and graduate students.[73] The students gathered the data, framed the report and received contributions from others across the Vanderbilt campus during a "Coding for Climate" Hackathon, which included students interested in data science, local policy, and climate mitigation to contribute to the report. In addition, two weeks before the conference, over twenty academic and non-academic experts conducted an initial review of the report and provided comments.

After receiving feedback, we presented and shared the draft at the Tennessee State of the Environment Conference and invited stakeholders to provide feedback. Public, private, and academic stakeholders across the region and state provided input and discussed environmental risks and policy priorities. The one-day event included panels and discussions on the State of Conservation and Land use, the State of Water, the State of Energy, and the State of Scholarship and Innovation. After integrating additional comments, we published the final draft and panel recordings on the Vanderbilt Law School website.[74] The report

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73 Caballero et al., *supra* note 68.

74 *See* Nate Luce, *Vanderbilt Law School Hosts Second Annual State of the Environment Conference*, Vand. Univ. L. Sch. (Apr. 17, 2024, 12:35 PM), https://law.vanderbilt.edu/vanderbilt-law-school-hosts-second-annual-state-of-the-environment-conference/ [https://perma.cc/5CHH-M7Z4].

and public processes were designed to be models that can be replicated in other regions, states, and localities, and ultimately, multiple reports of this type can be scaled up to fill the gap left by the lack of federal leadership on this topic.

Conclusion

This Article highlights the feasibility and value of developing data-driven, multi-scalar environmental reports at the local, state, regional, and national levels to fill the gap left by the termination of the federal CEQ SOE reports. In the Article, we use the Tennessee SOE report to illustrate the value of a report addressing meaningful regional, state and local indicators of environmental quality. We also demonstrate the feasibility and value of involving community stakeholders and students in a collaborative, real-world educational process, and providing relevant, foundational information for an annual event dedicated to local environmental governance.

The CEQ and Tennessee SOE reports demonstrate how environmental data can be presented in ways that improve public and expert understanding about the state of the environment and enhance decision-making about environmental priorities at the regional, state, and local levels. We suggest that in the long run these reports enhance federal environmental protection efforts by making the case for CEQ to re-visit its interpretation of the statutory language that induced it to stop producing annual reports after 1997. A report that enhances the ability of Congress, the White House, agency managers, and the public to focus on the most important environmental issues is an ideal instrument to meet the goal of limiting government waste.

The report and process discussed in this Article are just the first of what will likely be a long series of SOE reports. Enhancements are underway to create an even more transparent process by sharing the data and code used to generate the report before it is presented at the next conference. This process demonstrates that it is possible to develop a replicable approach for other regions, states, and local governments to create their own SOE reports. We encourage law schools and law students to take the lead in initiating meaningful conversations about regional, state, and local environmental priorities, and to engage private, public, and academic stakeholders in the process of generating analyses that can drive actionable change at the each level. The modern democracy deficit for environmental policymaking will not be addressed by any one response, but information on the most important risks and the status of solutions is an essential step in the right direction.

Carbon Credits: Potential Design of U.S. Federal Carbon Market Based on Lessons Learned from Paris Agreement and EU Emissions Trading System

*Paulina Korfanty-Pisana**

Abstract

This paper explores how the mechanisms of Article 6 of the Paris Agreement and the European Union Emissions Trading System ("EU ETS") can contribute to the development of a federal carbon market in the United States. As climate change mitigation is an urgent matter, a well-structured federal carbon market could be critical for the United States. Article 6 of the Paris Agreement, which provides a framework for cooperative approaches between countries as well as international carbon trading, offers insights on how cross-border cooperation can complement domestic climate policies. The EU ETS is the world's largest carbon market and provides valuable lessons in terms of design, implementation and governance, including cap-and-trade principles, auctioning mechanisms, stability mechanisms, carbon leakage measures and penalty system. This paper examines key elements of both Article 6 of the Paris Agreement and the EU ETS and analyzes how these solutions could be adopted to the U.S. context.

Table of Contents

* Master of Laws graduate with a concentration in Environmental Law at The George Washington University Law School. Polish judge at the District Court in Warsaw-Mokotow, adjudicating in civil cases. The author thanks Professor Peter Malyshev for his comments and directions in the writing process of this article, Associate Dean Randall Abate for his advice on publication of this article and the Editors of the George Washington Journal of Energy and Environmental Law for their diligent edits and constructive feedback.

I. Existing Legal Framework for Carbon Markets

The Paris Agreement and the European Union Emissions Trading System Directive ("EU ETS Directive")[1] are two prominent legal frameworks designed to address global climate change through market-based mechanisms. Both systems rely on carbon pricing and market-based approaches. The Paris Agreement provides the global framework for climate action while the EU ETS Directive implements climate action at a regional level. These frameworks and their key provisions will be discussed in the paragraphs below.

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[1] Council Directive 2003/87/EC, 2003 O.J. (L. 275) (EC)., https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02003L0087-20240301 [https://perma.cc/YYQ8-P3E8].

A. Paris Agreement

The Paris Agreement, adopted in 2015 as an amendment to the United Nations Framework Convention on Climate Change ("UNFCCC"), is heralded as a landmark moment in the evolution of the international climate regime.[2] The Paris Agreement shifted from the top-down approach with clear commitments and enforcement mechanisms adopted under Kyoto Protocol, to a bottom-up approach. The Paris Agreement sets out a framework for a global response to climate change. The ultimate long-term goals of the Paris Agreement are stabilizing average global temperature increase at 2 degrees Celsius above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels.[3] The bottom-up approach of Paris Agreement created a mechanism of "Nationally Determined Contributions" ("NDCs"),[4] which are voluntary commitments by each participating Party to reduce emissions and adapt to climate change. The Parties' pledges are not legally binding and not enforced. However, they are harmonized to some extent by substantive guidelines and strengthened by common rules of transparency, monitoring, review, and verification.[5] An important mechanism that aims at achieving the long-term goal and NDCs is carbon trading established under Article 6.2., 6.4, and 6.8 of the Paris Agreement.

1. Cooperative approaches under Article 6.2 of the Paris Agreement

The Paris Agreement allows Parties to enter into agreements that involve the use of internationally transferred mitigation outcomes ("ITMOs") which are emissions reductions or removals that one participating Party can transfer to another to assist in meeting its NDC targets.[6] In transferring ITMOs, Parties should ensure environmental

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2 David Hunter et al., International Environmental Law & Policy 591–724 (6th ed. 2022).

3 Paris Agreement to the United Nations Framework Convention on Climate Change art. 2(1), Dec. 12, 2015, T.I.A.S. No. 16-1104, https://unfccc.int/sites/default/files/english_paris_agreement.pdf [https://perma.cc/XSK3-734K] [hereinafter Paris Agreement].

4 *Id.* at art. 4(2).

5 Hunter et al., *supra* note 2, at 666.

6 Pursuant to Article 6.2 of the Paris Agreement:

> Parties shall, where engaging on a voluntary basis in cooperative approaches that involve the use of internationally transferred mitigation outcomes towards nationally determined contributions, promote sustainable development and ensure environmental integrity and transparency, including in governance, and shall apply robust accounting to ensure, inter alia, the avoidance of double counting, consistent with guidance adopted by the Conference of the Parties serving as the meeting of the Parties to this Agreement.

integrity and transparency, as well as robust accounting in order to avoid double counting.[7]

Under the Paris Agreement, a "mitigation outcome" ("MO") is one ton of CO2 reduction or removal—if the reduction is quantified, based on an agreed methodology, and independently verified. MOs are emission reduction credits ("carbon credits")[8] that can be produced from any mechanism procedure or protocol that is recognized or approved by the Parties to be eligible under Article 6.2.[9] Under Article 6.2, the transfer of emissions reductions has to be authorized by the selling country's government.[10] When authorized and transferred internationally to another country, an MO becomes an ITMO.[11] A carbon credit can be converted to an ITMO after authorization by the participating Parties.[12] The Paris Agreement established a Corresponding Adjustment ("CA"), an accounting mechanism under Articles 6.2 and 6.4 that ensures MOs are not "double counted".

So far only two countries–Thailand and Switzerland–have entered into a bilateral agreement under Article 6.2.[13] These carbon credits were generated under the "Bangkok E-Bus Programme" by the program owner, Energy Absolute Public Company Limited.[14] Credits were created by launching a fleet of up to 4,000 electric buses in Bangkok instead of petrol-fueled vehicles.[15] In January 2024, the Swiss Foundation for Climate Protection and Carbon Offset ("KliK") purchased the first 1,916 ITMOs and credited them to the Foundation's account in the Swiss Emissions Trading Registry.[16] The ITMOs will be used by the

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7 Double counting happens when a traded emissions reduction is counted once by the country of origin when reporting its emissions inventory, and again by the receiving country (or other entity) when justifying emissions above its pledged climate effort. *See* Env't Def. Fund, Meeting the Climate Change Goals of the Paris Agreement: How to Avoid Double Counting of Emissions Reductions, https://www.edf.org/sites/default/files/documents/double-counting-handbook.pdf [https://perma.cc/6E6M-UN73].

8 An emission reduction credit ("ERC") represents a standard unit to measure an emission reduction equivalent to one metric ton of carbon dioxide (tCO2e). A generic term for ERCs is a "carbon credit." When issued by a particular standard, an ERC becomes a named unit, e.g. an ERC issued under the Verified Carbon Standard is called a "Verified Carbon Unit" and an ERC issued by Gold Standard is called a "Gold Standard carbon credit." *See* World Bank Grp., Defining Results-Based Climate Finance, Voluntary Carbon Markets and Compliance Carbon Markets (2022), https://openknowledge.worldbank.org/server/api/core/bitstreams/0d-55d00c-cb34-5b6c-97aa-c9c237fdba9b/content [https://perma.cc/9F8S-DPWD].

9 *Id.*

10 *Id.*

11 *Id.*

12 Paris Agreement, *supra* note 3 at art. 6(3).

13 *First Ever ITMOs for NDC Use*, KliK Found. (Jan. 8, 2024), https://www.klik.ch/en/news/news-article/first-ever-itmos-for-ndc-use [https://perma.cc/Z2LB-DL4D].

14 *Id.*

15 *Id.*

16 *Id.*

KliK Foundation to fulfill its compensation obligation under the Swiss CO2 Act.[17] Switzerland intends to use these internationally transferred mitigation outcomes towards its NDCs.[18]

During the Conference of Parties ("CoP") that took place in November 2024 in Baku, Azerbaijan ("CoP29"), the CoP served as the meeting of the Parties to the Paris Agreement ("CMA"); Parties adopted the decision ("Article 6.2 decision") that includes guidance for the bilateral carbon credit trading mechanism under Article 6.2.[19] The Article 6.2 decision covers such issues as: authorization of the use of ITMOs, registries, sequencing and timing of reporting as well as processes of identifying, notifying, and correcting inconsistencies.[20] It clarifies the authorization process of ITMOs and its components, stating that authorization arranged by the participating Party should identify relevant registries that: (1) contain information on MOs or calculation of MOs made by the participating Party, and (2) transparently track the status of underlying mitigation activities and outcomes.[21] The Article 6.2 decision clarified that there will be a centralized accounting and reporting platform serving as a public repository for each participating statements of authorization.[22]

The Article 6.2 decision reaffirmed that the Article 6.2 database "shall enable the Secretariat to perform automated consistency checks of submitted information" to ensure the accuracy and completeness of the information.[23] The results of these consistency checks performed by the Secretariat are to "be made publicly available on the centralized accounting and reporting platform and show whether reported information submitted by the participating Party is consistent."[24] The Secretariat then communicates the outcomes of consistency checks to technical expert review teams and prepares a summary of consistency checks outcomes.[25] The technical expert review teams review the consistency of information reported by the participating Parties.[26]

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17 *Id.*

18 *Id.*

19 *See* Conference of Parties serving as the meeting to the Paris Agreement, Decision -/CMA.6, *Matters relating to cooperative approaches referred in Article 6, paragraph 2 of the Paris Agreement*, https://unfccc.int/sites/default/files/resource/CMA6_agenda%20item_15a_AUV.pdf [https://perma.cc/KB88-FFPJ] [hereinafter Decision -/CMA.6].

20 *Id.* at ¶ ¶ 2–5, 26–44.

21 *Id.* at ¶ 5(j).

22 *Id.* at ¶¶ 9–10.

23 *Id.* at ¶ 28.

24 *Id.* at ¶ 29.

25 *See* U.N. Framework Convention on Climate Change, Article 6.2: Reference manual for the accounting, reporting and review of cooperative approaches 49 (2024), https://unfccc.int/sites/default/files/resource/Article_6.2_Reference_Manual.pdf [https://perma.cc/W5DE-K3PV] [hereinafter UNFCCC Article 6.2 Reference Manual].

26 *See* Decision -/CMA.6, *supra* note 19, at ¶¶ 33–35.

The expert reviews will also contain consideration of results of the aforementioned consistency checks performed by the Secretariat.[27] These reviews shall recommend actions and "may indicate capacity-building needs and areas for improvement in consultation with the participating Party."[28] Technical expert reviews should be published by the Secretariat on the centralized accounting and reporting platform for each relevant cooperative approach or ITMO, indicating status of the review.[29] The Article 6.2 decision aims at ensuring environmental integrity of carbon credits. As the United Nations does not oversee the quality of environmental outcomes, the Paris Agreement needs provisions for transparency to ensure environmental integrity.

2. Crediting mechanism under Article 6.4 of the Paris Agreement

The Paris Agreement established an international carbon crediting mechanism known as the Paris Agreement Crediting Mechanism ("PACM"), under the authority and guidance of the CoP.[30] The Supervisory Body was created during CoP26 that took place in Glasgow in October 2021.[31] The primary task of the Supervisory Body is to supervise the Article 6.4 mechanism, particularly to establish requirements and processes necessary to operate the mechanism, relating to, *inter alia*, accreditation of operational entities, development and approval of methodologies as standardized baselines for Article 6.4 activities, registration of activities as Article 6.4 activities, registry of the mechanism, accreditation of third-party verification bodies, and managing the Article 6.4 Registry.[32]

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27 *See id.* at ¶ 35(d).

28 UNFCCC Article 6.2 Reference Manual, *supra* note 25, at 60.

29 Decision -/CMA.6, *supra* note 19, at ¶ 37.

30 Pursuant to Article 6.4 of the Paris Agreement:

> A mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development is hereby established under the authority and guidance of the Conference of the Parties serving as the meeting of the Parties to this Agreement for use by Parties on a voluntary basis. It shall be supervised by a body designated by the Conference of the Parties serving as the meeting of the Parties to this Agreement, and shall aim: a. To promote the mitigation of greenhouse gas emissions while fostering sustainable development; b. To incentivize and facilitate participation in the mitigation of greenhouse gas emissions by public and private entities authorized by a Party; c. To contribute to the reduction of emission levels in the host Party, which will benefit from mitigation activities resulting in emission reductions that can also be used by another Party to fulfil its nationally determined contribution; and d. To deliver an overall mitigation in global emissions.

31 *See* Conference of Parties serving as the meeting to the Paris Agreement, Decision 3/CMA.3, *Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement* ¶ 2 (2022), https://unfccc.int/sites/default/files/resource/cma2021_10a01E.pdf [https://perma.cc/483N-H82Y] [hereinafter Decision 3/CMA.3].

32 *Id.* at ¶ 24.

In October 2024, the Supervisory Body adopted two standards: (1) the standard on methodology requirements for developing and evaluating projects under PACM; and (2) the standard on requirements of activities involving removals of greenhouse gases ("GHG") from the atmosphere.[33] The CoP29 parties approved these standards and agreed that the Supervisory Body will implement them.[34]

Both standards cover application of requirements of the Article 6.4 mechanism methodologies.[35] According to these standards, the Article 6.4 mechanism methodology should encourage ambition over time, be below "business as usual" levels, and align with the long-term temperature goal of the Paris Agreement.[36] The first standard (on methodology requirements) provides regulations on setting the baseline – *i.e.*, an emission level that occurs without a project or an activity.[37] Emissions reductions and removals under PACM are calculated as a difference between baseline emissions and actual emissions (or removals) achieved by the project.[38] As previously mentioned, the baseline should be determined below 'business as usual' levels.

Moreover, participating Parties, when determining the baseline, may consider performance-based approaches, taking into account: (1) "best available technologies that represent an economically feasible and environmentally sound course of action;" (2) "an ambitious benchmark approach where the baseline is set at least at the average emission level of the best performing comparable activities;" and (3) "an approach based on existing actual or historical emissions, adjusted

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33 *Key Standards for UN Carbon Market Finalized Ahead of COP29,* U.N. Climate Change (Oct. 10, 2024), https://unfccc.int/news/key-standards-for-un-carbon-market-finalized-ahead-of-cop29 [https://perma.cc/HFS3-ZPWX].

34 *See* Conference of Parties serving as the meeting to the Paris Agreement, Decision -/CMA.6, *Guidance on the mechanism established by Article 6, paragraph 4, of the Paris Agreement* ¶ 3, https://unfccc.int/sites/default/files/resource/CMA_6_agenda%20item15b_AUV_1.pdf [https://perma.cc/N2MB-EUG4].

35 The mechanism methodologies in this standard should satisfy the requirements stated in the Decision 3/CMA.3 on Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement adopted by the CMA during CoP26 in Glasgow. *See* Decision 3/CMA.3, *supra* note 31, at ¶¶ 33–36.

36 *Id.* at ¶ 33.

37 Vintura Silva, *Options and methodologies for developing baselines*, U.N. Framework Convention on Climate Change (Oct. 2014), https://unfccc.int/files/focus/mitigation/application/pdf/options_and_methodologies_for_developing_baselines_.pdf#:~:text=Steps%20for%20Baselines%20Approaches%20to%20%EE%80%80Baseline%EE%80%81 [https://perma.cc/RNH6-LWZZ].

38 Michael Gillenwater, *What is a baseline?*, Greenhouse Gas Mgmt. Inst. (Mar. 14, 2022), https://ghginstitute.org/2022/03/14/what-is-a-baseline [https://perma.cc/6SQH-4VYT].

downwards."[39] The Supervisory Body must make sure that the baseline is not too lenient, as this could lead to an overestimation of emissions reductions and the generation of carbon credits for emissions reductions that would have occurred even without the project. According to the standard, to prevent over-crediting when the baseline is overestimated, a downward adjustment has to be applied.[40] Activities under the PACM should be additional (*e.g.*, by reducing emissions, increasing removals, and not leading to an increase of global emissions). The second standard (on activities involving removals) contains definitions of key terms such as: removals, reversals, calculations of removals, as well as provisions on monitoring and reporting, including post crediting monitoring and reporting.[41]

Apart from accepting the standards, the CMA made several important decisions that concern PACM. Firstly, the CMA urged the Supervisory Body and the Secretariat to expedite establishment of the mechanism registry and relevant procedures therefor.[42] The CoP29 decided that participating Parties will be entitled to voluntarily connect to the mechanism registry and this connection will enable a transfer of authorized Article 6.4 emissions reductions, while ensuring avoidance of double counting.[43] The Secretariat was tasked with implementing the mechanism registry in a manner that will make the registry available by all Parties participating in the mechanism.[44] Secondly, the CMA decided that afforestation and reforestation projects may transition from the Clean Development Mechanism[45] to PACM, provided that the

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39 *Standard: Application of the Requirements of Chapter V.B (Methodologies) for the Development and Assessment of Article 6.4 Mechanism Methodologies*, U.N. Framework Convention on Climate Change ¶ 37 (Oct. 9, 2024), https://unfccc.int/sites/default/files/resource/A6.4-SBM014-A05.pdf [https://perma.cc/YM4V-4Q7R].

40 *Id.* at ¶ 43.

41 *Standard: Requirements for Activities Involving Removals under the Article 6.4 Mechanism*, U.N. Framework Convention on Climate Change (Oct. 9, 2024), https://unfccc.int/sites/default/files/resource/A6.4-SBM014-A06.pdf [https://perma.cc/6JDV-K4E3].

42 Conference of Parties serving as the meeting to the Paris Agreement, Decision -/CMA.6, *Further Guidance on the Mechanism Established by Article 6, Paragraph 4* ¶ 5, https://unfccc.int/sites/default/files/resource/CMA_6_agenda%20item15b_AUV_2.pdf [https://perma.cc/C2YX-4GBY].

43 Decision -/CMA.6, *supra* note 19, at ¶ ¶ 16–17.

44 *Id.* at ¶ 18.

45 The Clean Development Mechanism (CDM) was established by Article 12 of the Kyoto Protocol. It allowed countries with emission-reduction targets (primarily industrialized, developed) under the Kyoto Protocol to implement an emission-reduction project in developing countries. These projects earned certified emission reduction credits that could be sold. By purchasing these credits, countries with emission-reduction targets count these credits towards meeting Kyoto targets. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 2303 U.N.T.S. 162, 224. With the adoption of the Paris Agreement, the CDM was replaced by Article 6 of the Paris Agreement. *See* Decision 3/CMA.3, *supra* note 31.

designated national authority approves a request for transition sent to the Secretariat no later than 31 December 2025.[46]

3. Non-market approaches under Article 6.8 of the Paris Agreement

The Paris Agreement intends to establish a framework for countries to cooperate through non-market approaches which are not based on the exchange of carbon credits.[47] Article 6.8 of the Paris Agreement emphasizes cooperative approaches to assist in the implementation of NDCs with a focus on sustainability, adaptation, capacity-building, and technology transfer.[48] The non-market approaches framework is developing gradually. The first phase of implementation took place in 2023-2024, while the second phase is anticipated to take place in 2025-2026.[49] The CMA at CoP29 issued the following recommendations for the second phase: continuing work on non-market approaches in the context of all relevant elements of the work programme activities,[50] linking climate change with biodiversity conservation and sustainable development under the non-market approaches,[51] broadening spin-off group participation by engaging public and private stakeholders, focusing on knowledge sharing,[52] and inviting representatives of Indigenous Peoples and local communities to in-session workshops.[53]

B. European Union Trading System

The European Union Emissions Trading System (EU ETS) was launched on January 1, 2005 by adopting the EU ETS Directive.[54] Since then, the EU ETS Directive was revised several times to better achieve the EU's climate goals. It operates in all EU countries in addition to

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46 Decision -/CMA.6, *supra* note 19, at ¶ 21.

47 *See* Conference of Parties serving as the meeting to the Paris Agreement, *Decision -/CMA.6*, *Work programme under the framework for non-market approaches referred to in Article 6, paragraph 8, of the Paris Agreement and in decision 4/CMA.3* ¶ 9, https://unfccc.int/sites/default/files/resource/Art6.8_CMA_15c.pdf [https://perma.cc/ZMU3-4MSD].

48 *Id.* at ¶ 22.

49 *Id.* at ¶ 4.

50 *Id.* at ¶ 9.

51 *Id.* at ¶ 13.

52 *Id.* at ¶ 14(a), (b).

53 *Id.* at ¶ 17.

54 Article 288 of the Treaty on the Functioning of the European Union states that a directive is binding as to the result to be achieved and in Member States to whom it is addressed. Member States national authorities have the power to choose the form and methods to achieve the result. They have to transpose the directive into national law before it is applicable in the Member State. *See* Consolidated Version of the Treaty on the Functioning of the European Union art. 288 (Oct. 26, 2012), https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12012E/TXT:en:PDF [https://perma.cc/6SRX-62RU].

Iceland, Liechtenstein, and Norway. Since 2020, the EU ETS has been linked to the Swiss ETS.[55] The EU ETS Directive covers emissions from electricity and heat generation, industrial manufacturing, and aviation sectors, which account for around 40% of total GHGs emissions in the EU.[56] Additionally, it started covering emissions from maritime transport in 2024.[57] The main principles of the EU ETS will be discussed below.

1. Cap and Trade System and allocation of allowances

In the EU, all Member States shall ensure that from January 1, 2005, no installation[58] can carry out any activity listed in Annex I of the EU ETS Directive, resulting in GHG emissions specified in relation to that activity, unless its operator holds a permit issued by a competent authority.[59] The EU ETS Directive sets an EU-wide cap on emissions from all sectors covered. Each year, the EU issues an EU-wide quantity of allowances.[60] The EU ETS Directive specifies a linear factor by which the quantity of allowances will decrease in a given period of time, in order to meet the EU's emissions reduction targets.[61] The EU ETS Directive does not set a "hard cap" on each of the four sectors covered by the Directive, rather distribution of allowances is a result of auctioning and free allocation of allowances.[62] Until 2013, allowances were allocated to Member States for free.[63] Member States oversaw developing national allocation plans which included information on the total quantity of allowances to be allocated as well as how the Member

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55 Council of the E.U. Press Release 793/19, Linking of Switzerland to the EU emissions trading system - entry into force on 1 January 2020 (Dec. 9, 2019, 7:00 PM), https://www.consilium.europa.eu/en/press/press-releases/2019/12/09/linking-of-switzerland-to-the-eu-emissions-trading-system-entry-into-force-on-1-january-2020/ [https://perma.cc/8PQR-GCQ3].

56 *About the EU ETS*, Eur. Comm'n, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/what-eu-ets_en [https://perma.cc/4Z9Q-5F3N].

57 *Id.*

58 Council Directive 2003/87/EC, art. 3, 2003 O.J. (L 275) 1, 5 (EC). An "installation" is defined under Article 3 of the ETS Directive as a stationary technical unit where one or more activities listed in Annex I are carried out and could have effect on emissions and pollution. Annex I activities include for example: combustion of fuels, refining of oil, production of iron and steel, production of aluminum and others.

59 *Id.* at art. 4.

60 *Id.* at art. 9.

61 *Id*.

62 *EU ETS emissions cap,* Eur. Comm'n, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/eu-ets-emissions-cap_en [https://perma.cc/C7HK-ZHS6].

63 Council Directive 2003/87/EC, art. 10, 2003 O.J. (L. 275) 1, 24 (EC), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02003L0087-20090625 [https://perma.cc/F8FL-9N2K].

State proposes to allocate them.[64] The EU ETS Directive contained provisions for the phase-down of free allowances and an increase in the share of allowances allocated through auctioning over time.[65] From 2019 onwards, the default rule is that Member States auction all allowances that are not allocated for free and are not placed in the market stability reserve.[66] Allocation of free allowances is very limited. Free allowances are allocated to sectors that are exposed to significant risk of carbon leakage. These sectors or subsectors shall have allocated allowances for the period until 2030 at the quantity determined by the Directive.[67] Such sectors are subject to carbon constraints. They are at risk of losing market share as they are less competitive in comparison to sectors in third countries with no comparable carbon constraints.[68] These sectors are typically energy-intensive and trade-exposed. Allocation of free allowances is based on a benchmarking system; the EU determines EU-wide transitional ex-ante benchmarks to ensure that allocation of free allowances provides incentives for reductions in GHG emissions and energy efficient techniques.[69] Free allowances should not provide incentives to increase emissions.[70] Moreover, no free allocation shall be made in respect of any electricity production, except for the modernization, diversification, and sustainable transformation of the energy sector.[71] Free allowances are also allocated to new market entrants, *i.e.*, installations carrying out activities covered by Annex I which have obtained a GHG emission permit for the first time.[72] Similarly, no free allocations will be made for any electricity production by new entrants.[73]

2. Market stability reserve

The Market Stability Reserve ("MSR") was established in the EU Decision ("MSR Decision")[74] in 2015 and began operation on January 1, 2019.[75] The main goal of the market stability reserve is to prevent

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64 Council Directive 2003/87/EC, art. 9, 2003 O.J. (L. 275) 1, 8 (EC), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02003L0087-20041113 [https://perma.cc/UH76-GN38].

65 Council Directive 2003/87/EC, *supra* note 63, at art. 10(a).

66 Council Directive 2003/87/EC, *supra* note 1, at art. 10.

67 *Id.* at art. 10(b).

68 Council Directive 2018/410, recital ¶ 10, 2018 O.J. (L. 76) 1, 3 (EC), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L0410 [https://perma.cc/TA8M-SQCQ].

69 *Carbon leakage*, Eur. Comm'n, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/free-allocation/carbon-leakage_en [https://perma.cc/9PPS-CA53].

70 *Id.*

71 Council Directive 2003/87/EC, *supra* note 1, at art. 10(a)(1).

72 *Id.* at art. 10(a)(7).

73 *Id.* at art. 10(a)(7).

74 Council Decision 2015/1814, art. 1, 2015 O.J. (L. 264) 1, 1 (EC), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015D1814 [https://perma.cc/3932-5EN3].

75 *Id.* at art. 1(1).

excessive price volatility of allowances as well as to manage the surplus of allowances.[76] As mentioned, not all issued allowances can be auctioned. A certain number of allowances are placed in the MSR.[77] The MSR Decision requires the Commission to publish an information on a total number of allowances in circulation ("TNAC") each year.[78] The MSR is used to manage the number of allowances by releasing allowances from the MSR or placing the allowances in the MSR.[79] The MSR Decision was subject to a few amendments. Currently, the thresholds for MSR interventions are the following:

- If in any given year, TNAC is between 833 million and 1,096 million, a number of allowances equal to the difference between TNAC and 833 million shall be deducted from the quantity of allowances to be auctioned by Member States and shall be placed in the MSR over a period of 12 months beginning on September 1 of that year;
- If TNAC is above 1,096 million allowances, the number of allowances to be deducted from the quantity of allowances to be auctioned by Member States and to be placed in the reserve over a period of 12 months beginning on September 1 of that year shall be equal to 12 % of TNAC.[80]
- If in any year, TNAC is less than 400 million, 100 million allowances shall be released from the reserve and added to the volume of allowances to be auctioned by Member States. If fewer than 100 million allowances are in the reserve, all allowances in the reserve shall be released.[81]

Moreover, in the event of excessive price fluctuations, if the average allowance price for the six preceding calendar months is more than 2.4 times the average allowance price for the preceding two-year reference period, 75 million allowances will be released from the MSR.[82] Each month, the Commission is required to publish the average allowance price for the preceding six calendar months and the average allowance price for the preceding two-year reference period.[83]

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76 *Market Stability Reserve*, Eur. Comm'n, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/market-stability-reserve_en [https://perma.cc/M5TN-843V].

77 Council Directive 2003/87/EC, *supra* note 1, at art. 10.

78 Council Decision 2015/1814, *supra* note 74, at art. 1(4).

79 *Id.* at recital ¶ 5.

80 *Id.* at art. 1(5).

81 *Id.* at art. 1(6).

82 Council Directive 2003/87/EC, *supra* note 1, at art. 29(a)(1).

83 *Id.*

3. Transfer and surrender of allowances

Under the EU ETS, Member States have to ensure that allowances can be transferred between persons (any natural or legal persons) within the EU as well as between persons within EU and persons in third countries where the allowances are recognized.[84] The EU ETS Directive allows the EU ETS to enter into linking agreements with other GHGs trading systems in third countries.[85] These agreements could be made to provide recognition of allowances between compatible mandatory GHGs trading systems, allowing persons within the EU ETS to transfer allowances to persons within other GHG trading systems.[86] On January 1, 2020, the agreement between the EU and Switzerland that linked the EU ETS and Swiss trading system entered into force.[87] Moreover, in terms of surrendering allowances, Member States have to ensure that emitters surrender a number of allowances that equals total emissions in the preceding year.[88]

4. Penalty system for non-compliance

In the EU ETS, Member States can enforce national provisions adopted pursuant to the EU ETS Directive by establishing rules on penalties for non-compliance with these provisions.[89] Under the Directive, Member States are entitled to take all necessary measures to ensure that such rules are implemented.[90] Further, Member States are required to publish the names of operators who failed to surrender sufficient allowances under the EU ETS Directive.[91] Member States shall ensure that any operator that did not surrender allowances on time will pay an excess emissions penalty.[92] The excess emissions penalty amounts to 100 EUR for each ton of CO2 emissions that was not covered by the allowances.[93] It is paid on top of the allowances that have to be surrendered.[94] If the aircraft operators or shipping companies fail to comply with the requirements of the ETS Directive and enforcement measures have failed to ensure compliance, a Member State administering an aircraft operator may request the Commission to impose an operating

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84 *Id.* at art. 12(1).
85 *Id*. at art. 25(1)–25(1a).
86 *Id.* at art. 25.
87 Council of the E.U. Press Release 793/19, *supra* note 55.
88 Council Directive 2003/87/EC, *supra* note 1, at art. 12(3).
89 *Id.* at art. 16(1).
90 *Id.*
91 *Id.* at art. 16(2).
92 *Id.* at art. 16(3).
93 *Id.* at art. 16(3).
94 *Id.* at art. 16(3).

ban on such aircraft operator.[95] Moreover, in case of shipping companies that are not compliant with the ETS Directive, Member States can refuse entry of ships operating under responsibility of the shipping companies that did not surrender allowances.[96]

5. The Carbon Border Adjustment Mechanism

In 2023, the EU introduced an initiative for a carbon border adjustment mechanism ("CBAM") in the CBAM Regulation.[97] The objective of CBAM is to prevent the risk of carbon leakage.[98] CBAM will start operating with a transitional period, but its definitive period will begin in 2026.[99] CBAM will gradually phase out allocation of free allowances which is the existing mechanism for preventing carbon leakage.[100] CBAM will address the risk of carbon leakage in a different way, namely by ensuring equivalent carbon pricing for imported and domestic products.[101] CBAM complements the EU ETS Directive as the current EU ETS Directive (*i.e.*, without regulations on free allowances) does not provide solutions for carbon leakage. CBAM addresses GHGs emissions embedded in electrical energy and goods containing cement, fertilizers, iron, steel, aluminum, and hydrogen.[102] The CBAM Regulation applies to these goods if they originate in a third party and are imported into the customs territory of the EU.[103] Goods can be imported into the customs territory of the EU only by an authorized CBAM declarant.[104] Any importer who intends to import goods to the EU has to apply for the status of an authorized CBAM declarant.[105]

A Member State, in which an applicant is established, is the competent authority to grant the status of an authorized CBAM declarant, provided that the applicant meets relevant requirements.[106] The status of an authorized CBAM declarant shall be recognized in all Member

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95 *Id.* at art. 16(5),

96 *Id.* at art. 16(10)(a).

97 Commission Regulation 2023/956, 2023 O.J. (L. 130) 1, 1 (EC), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R0956 [https://perma.cc/CXD8-LAQA]; *see also* Consolidated Version of the Treaty on the Functioning of the European Union, *supra* note 54, at art. 288 (stating a regulation is directly applicable and binding in all Member States, without any action on the part of Member States).

98 Commission Regulation 2023/956, *supra* note 97, at recital ¶ 15.

99 *Id.* at recital ¶ 57.

100 *Id*. at recitals ¶ ¶ 11, 12.

101 *Id.* at recital ¶ 12.

102 *Id.* at recitals ¶ ¶ 19, 32.

103 *Id.* at recital ¶ 16.

104 *Id*. at art. 4.

105 *Id.* at art. 5.

106 *Id.* at art. 11(1).

States.[107] For the first time in 2027 for the year 2026, each authorized CBAM declarant must submit a CBAM declaration for the preceding calendar year by May 31st of each year.[108] The CBAM declaration shall contain the following information: (1) the total quantity of each type of goods imported; (2) the total embedded emissions in the goods expressed in tons of CO2e, calculated and verified per the CBAM Regulation; and (3) the total number of CBAM certificates to be surrendered, corresponding to total embedded emissions after the reduction of carbon price paid in a country of origin.[109] The CBAM Regulation established the CBAM registry, which contains data on CBAM certificates assigned to authorized CBAM declarants.[110] A Member State shall sell CBAM certificates on a common central platform to authorized CBAM declarants in that Member State.[111] The Commission will calculate the price of CBAM certificates as the average of the closing prices of EU ETS allowances on the auction platform.[112] The Commission will publish the average price on its website.[113] Each authorized CBAM declarant will be obliged to surrender via the CBAM registry a number of CBAM certificates that correspond to the embedded emissions declared in the CBAM declaration.[114] After the declarant surrenders CBAM certificates, the Commission will remove these certificates from the CBAM registry.[115] Upon request of an authorized CBAM declarant, a Member State shall repurchase excessive certificates.[116] The repurchase will be limited to one third of the total number of CBAM certificates purchased by the authorized CBAM declarant.[117] The repurchase price will be the price paid for CBAM certificates at the time of the purchase.[118] An authorized CBAM declarant who fails to surrender CBAM certificates will pay a penalty in the amount of 100 EUR for each ton of emissions that was not covered by CBAM certificates.[119]

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107 *Id.* at art. 17.
108 *Id.* at art. 22.
109 *Id.* at art. 6.
110 *Id.* at art. 14.
111 *Id.* at art. 20.
112 *Id.* at art. 21(1).
113 *Id.* at art. 21(2).
114 *Id.* at art. 22(1).
115 *Id.*
116 *Id.* at art. 23(1).
117 *Id.* at art. 23(2).
118 *Id.* at art. 23(3).
119 *Id.* at art. 26. Council Directive 2003/87/EC, *supra* note 1, at art. 16(3).

II. Application of the Paris Agreement and EU ETS Regulations to the Future Regulation of the U.S. Federal Carbon Market

The Paris Agreement and the EU ETS Directive provide several mechanisms that, after tailoring to U.S. circumstances, could be applied to the creation of a potential federal carbon trading system. It should be emphasized that both these systems are foundationally different. Generally, carbon market systems are divided into three main categories: compliance carbon markets, international carbon markets, and voluntary carbon markets.[120]

The Paris Agreement is an international carbon market. Participating Parties make voluntary, NDCs to reduce their GHGs emissions. The Paris Agreement will allow participating Parties to achieve their targets in reducing GHGs emissions through cross-border trading of carbon credits coming from specific projects (Article 6.4) or trading of their own reductions with other parties based on bilateral agreements (Article 6.2).[121] Parties participating in this system will never be liable for not achieving their goals.[122] On the other hand, the EU ETS is a compliance carbon market. Participants of the EU ETS must be in compliance with regulations of the EU ETS Directive, otherwise, the enforcement mechanisms will be triggered.[123] Because the U.S. federal carbon market would also have to be a compliance carbon market, more mechanisms from the EU ETS Directive, rather than the Paris Agreement, would be applicable in the U.S. context.

However, when applying these mechanisms in the U.S. regulatory regime, the regional differences between states in terms of energy mix, available fuels, population size and density, and dominant industry sectors should be taken into consideration. In 2022. the following sectors contributed the most to the U.S. GHGs total emissions: industry (29.5%), transportation (28.5%), residential (15.3%), commercial (15.8%), and agriculture (10.5%).[124] The contribution of states towards

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120 Voluntary carbon markets are not regulated by legally binging acts. They are a platform for stakeholders (mostly corporations but also institutions and individuals) to purchase carbon credits from carbon offset projects, in order to offset their own carbon emissions. The carbon offset projects are verified using independent crediting standards, e.g. gold standard. *See* U.N. Climate Change, Introduction to international carbon markets (Nov. 13, 2023), https://unfccc.int/sites/default/files/resource/Session%204_Introduction%20to%20International%20VCMs_APCW.pdf [https://perma.cc/2GK9-AYSD].

121 Paris Agreement, *supra* note 3, at art. 6(2), 6(4).

122 Hunter et al., *supra* note 2, at 666.

123 Council Directive 2003/87/EC, *supra* note 1, at art. 16.

124 Env't Prot. Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2022 2–35 (Apr. 11, 2024), https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf [https://perma.cc/9DND-8LTX].

GHGs emissions varies significantly but several patterns should be underlined. Firstly, the biggest total emissions usually come from industrialized states with large industrial sectors or energy-intensive sectors such as Texas (due to oil and gas extraction and power generation from natural gas and coal), California (due to high population and power generation from natural gas and coal), and Florida (due to high population and power generation from natural gas).[125] Secondly, states present different emissions profiles in terms of power generation. States such as Texas, West Virginia, and Wyoming are dependent on fossil fuels.[126] In 2016, coal consumption accounted for 75% of energy-related CO2 emissions in West Virginia and 71% in Wyoming.[127] Typically these states have a high carbon intensity index calculated as an amount of CO2 per million dollars of state GDP.[128] On the other hand, states with more diversified or clean energy sectors, such as California and Washington, tend to have lower carbon intensity.[129] Thirdly, states with high urban populations such as California, New York, and Illinois, have high emissions from the transportation sector.[130] Even though California adopted stringent regulations under the Clean Air Act for mobile sources, the state still is a top contributor to GHG emissions from the transportation sector.[131] Lastly, states with high-intensity industries tend to have high emissions of CO2 (*e.g.*, Louisiana has high industrial emissions due to its significant petrochemical industry).[132]

A. U.S. Regulation of Carbon Markets

A federal carbon market has never been created in the U.S., but several states have implemented their own market-based programs to regulate GHG emissions. California implemented its own Cap-and-Trade Program, which is a key element of California's strategy to reduce GHG emissions.[133] The second trading system is the Regional Greenhouse Gas Initiative ("RGGI") which was developed by several Eastern States of the U.S., including Connecticut, Delaware, Maine,

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125 U.S. Energy Info. Admin., Energy-Related Carbon Dioxide Emissions by State, 2005-2016 (Feb. 2019), https://www.eia.gov/environment/emissions/state/analysis/pdf/stateanalysis.pdf [https://perma.cc/8FAS-8TPL].

126 *Id.*

127 *Id.*

128 *Id.*

129 *Id.*

130 *Id.*

131 *Id.*

132 *Id.*

133 *Cap-and-Trade Program*, Cal. Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program [https://perma.cc/L435-7ZAS].

Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.[134] It is a market-based cap-and-invest program where revenues from the sale of allowances are invested by the participating states in consumer benefit programs to improve energy efficiency and accelerate the deployment of renewable energy technologies.[135]

1. Unsuccessful attempts to regulate the federal carbon market in the U.S.

Throughout the last 20 years, there have been several attempts to regulate the federal carbon market in the U.S., but they have never succeeded. The first attempt was the McCain-Lieberman Climate Stewardship Act of 2003, sponsored by Senators John McCain and Joe Lieberman.[136] The bill proposed a cap-and-trade system based on tradeable allowances, specifically in the electric generation, industrial, and commercial sectors.[137] The bill did not pass the Senate Environment and Public Works Committee.[138] The second attempt to establish a federal cap-and-trade system was the Lieberman-Warner Climate Security Act of 2008, sponsored by Senators Joe Lieberman and John Warner.[139] The bill passed the Senate Environment and Public Works Committee, but did not get enough votes in the full Senate.[140] The third attempt was the Waxman-Markey American Clean Energy and Security Act of 2009.[141] The bill proposed establishing a cap-and-trade system for GHGs emissions and setting goals for reducing such emissions from covered sources by 83% of 2005 levels by 2050.[142] The bill passed the House of Representatives, but was not put into vote in the Senate.[143]

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134 *Elements of RGGI*, Reg'l Greenhouse Gas Initiative Inc., https://www.rggi.org/program-overview-and-design/elements [https://perma.cc/9FAD-K4W5].

135 *Id.*

136 S.139, 108th Cong. (2003), https://www.congress.gov/bill/108th-congress/senate-bill/139/all-actions?overview=closed#tabs [https://perma.cc/PA69-3ZEB].

137 *Id.*

138 *Id.*

139 S. 2191, 110th Cong. (2007), https://www.congress.gov/bill/110th-congress/senate-bill/2191 [https://perma.cc/2MF6-PMZL].

140 *Id.*

141 H.R. 2454, 111th Cong. (2009), https://www.congress.gov/bill/111th-congress/house-bill/2454 [https://perma.cc/9Z28-59LC].

142 *Id.*

143 *Id.*

2. Inflation Reduction Act of 2002

In 2022, under the Biden Administration, Congress passed the Inflation Reduction Act ("IRA").[144] The bill did not create a federal carbon market in the U.S., but offered funding to accelerate the transition to a clean energy economy.[145] The IRA introduced financial incentives for clean energy projects, carbon reduction projects, and offsetting projects.[146] For example, the bill introduced credits for carbon capture projects[147] and cost recoveries for energy storage technologies.[148]

3. Carbon credits as commodities under U.S. law

The term "commodity" is defined under the Commodity Exchange Act ("CEA").[149] Under the CEA, commodities are goods, services, rights, and interests in which there could be contracts for future delivery.[150] Carbon credits are not explicitly defined as commodities under U.S. law. as they are not explicitly listed as a commodity in this definition.[151]

The Commodity Futures Trading Commission ("CFTC") has general jurisdiction over physical transactions on commodities, such as spot transactions and forwards, which entitles CFTC to prosecute for fraud and manipulation in these transactions.[152] The CFTC has exclusive jurisdiction over derivative transactions on commodities, such as futures and swaps, which entitles CFTC to enforce provisions of the CEA and to prosecute fraud and market manipulation in futures and derivatives

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144 Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818 (2022), https://www.congress.gov/bill/117th-congress/house-bill/5376 [https://perma.cc/4V5U-NU6D] [hereinafter IRA of 2022].

145 *Summary of Inflation Reduction Act provisions related to renewable energy*, Env't Prot. Agency, https://www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy [https://perma.cc/8AM8-UPQH].

146 *Id.*

147 IRA of 2022, *supra* note 144, at § 13104.

148 *Id.* at § 13703.

149 The Commodity Exchange Act, Pub. L. No. 74-675, 49 Stat. 1491 (1936).

150 *Id.* at § 1(a)(9).

151 Under § 1(a)(9) of CEA,

> The term "commodity" means wheat, cotton, rice, corn, oats, barley, rye, flaxseed, grain sorghums, mill feeds, butter, eggs, Solanum tuberosum (Irish potatoes), wool, wool tops, fats and oils (including lard, tallow, cottonseed oil, peanut oil, soybean oil, and all other fats and oils), cottonseed meal, cottonseed, peanuts, soybeans, soybean meal, livestock, livestock products, and frozen concentrated orange juice, and all other goods and articles, except onions (as provided by section 13–1 of this title) and motion picture box office receipts (or any index, measure, value, or data related to such receipts), and all services, rights, and interests (except motion picture box office receipts, or any index, measure, value or data related to such receipts) in which contracts for future delivery are presently or in the future dealt in. *Id.*

152 7 U.S.C. § 2(a)(1)(A).

markets.[153] If carbon credits were not considered commodities, CFTC would have no jurisdiction over transactions based on carbon credits. *A contrario*, if CFTC undertakes enforcement actions regarding carbon credits, it treats them as commodities. In October 2024, CFTC, the Securities and Exchange Commission ("SEC"), and the U.S. Department of Justice initiated coordinated enforcement actions against Kenneth Newcombe, CQC Impact Investors LLC ("CQC"), and Jason Steele.[154] Kenneth Newcombe is the former CEO and majority shareholder of a carbon credit project developer. In the complaint, CFTC alleged that Newcombe participated in a scheme that involved reporting false and misleading information to a carbon credit registry and third-party reviewers. These activities were undertaken "to present a misleading impression of the quality of the project developer's emissions-reduction projects and obtain carbon credits beyond what the company was entitled to receive."[155] CFTC also issued orders filing and settling charges against CQC and Jason Steele, CQC's former COO.[156]

The CQC order refers to fraudulent reporting of false, misleading, and inaccurate information on a number of cookstoves that were allegedly installed in sub-Saharan Africa, Asia, and Central America within a carbon offset project.[157] The project resulted in issuances of millions more carbon credits than CQC was entitled to receive.[158] The order imposed a $1 million civil monetary penalty on CQC; CQC admitted the CFTC findings and acknowledged that its conduct violated the CEA and CFTC regulations.[159] CFTC also issued an order against Jason Steele who was charged for intentional participation in providing of false and misleading information.[160] These were the first CFTC actions for fraud in the voluntary carbon credit ("VCC") market. On the derivatives markets, VCCs can be traded as derivatives— voluntary carbon credits futures.[161] These enforcement actions ultimately determine that carbon credits are commodities under U.S. law because CFTC exercises its jurisdiction over them. The SEC enforcement action was targeted

153 *Id.*

154 Press Release, Commodity Futures Trading Comm'n, CFTC Charges Former CEO of Carbon Credit Project Developer with Fraud Involving Voluntary Carbon Credits (Oct. 2, 2024), https://www.cftc.gov/PressRoom/PressReleases/8994-24 [https://perma.cc/UF6Z-CETN].

155 *Id*.

156 *Id.*

157 *Id.*

158 *Id.*

159 *Id.*

160 *Id.*

161 Jennifer L., *Carbon Credit Futures (How Does It Work)*, CarbonCredits.com (Feb. 24, 2023), https://carboncredits.com/carbon-credit-futures-how-does-it-work/ [https://perma.cc/9346-K4BC].

against CQC.[162] CQC was charged for fraudulent conduct in the offer or sale of securities and in connection with the purchase or sale of securities.[163] CQC admitted to the facts in the SEC's order and acknowledged that its conduct violated the federal securities laws.[164] However, the SEC did not explicitly determine that carbon credits are securities.[165]

Moreover, in October 2024, CFTC approved Guidance Regarding the Listing of Voluntary Carbon Credit Derivative Contracts ("CFTC guidance").[166] The CFTC guidance applies to designated contract markets ("DCMs"). The CFTC guidance is not a binding rule; it outlines factors for consideration for DCMs, when addressing certain requirements under the CEA, that are relevant to the listing and trading of VCCs.[167] Firstly, DCMs should list only derivative contracts that are not readily susceptible to manipulation.[168] As a general matter, DCMs shall consider characteristics of a VCC commodity when selecting one or more crediting programs from which eligible VCCs may be delivered at the contract's settlement.[169] When addressing quality standards of a VCC derivative contract, DCMs should consider the following commodity characteristics: transparency, additionality, permanence and risk of reversal, and robust quantification.[170] Secondly, DCMs shall monitor the derivative contract's terms and conditions as they relate to the underlying commodity market and convergence between the contract price and the price of the underlying commodity.[171] DCMs should also monitor supply of the underlying commodity in the context of the contract's delivery requirements in order to identify situations when a contract may be susceptible to price manipulation.[172]

Defining carbon credits as commodities under U.S. federal law would have significant consequences for the potential regulation of the U.S. federal carbon market. Even though the Environmental Protection Agency ("EPA"), in cooperation with the Department of Energy, would hold the most authority in creating a federal carbon market, defining carbon credits as commodities gives a share in this authority to CFTC.

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162 CQC was charged for violating Section 17(a) of the Securities Act and Section 10(b) of the Exchange Act, and Rule 10b-5 thereunder. *See* CQC Impact Invs. LLC, *infra* note 165.

163 Press Release, *supra* note 154.

164 *Id.*

165 CQC Impact Invs. LLC, Exchange Act Release No. 1131 (ALJ Oct. 2, 2024), https://www.sec.gov/files/litigation/admin/2024/33-11315.pdf [https://perma.cc/47ER-D62K].

166 Commission Guidance Regarding the Listing of Voluntary Carbon Credit Derivative Contracts, 89 Fed. Reg. 83378 (Oct. 15, 2024) (to be codified at 17 C.F.R. pt. 38), https://www.govinfo.gov/content/pkg/FR-2024-10-15/pdf/2024-23105.pdf [https://perma.cc/LS23-UK83].

167 *Id.*

168 *Id.*

169 *Id.*

170 *Id.*

171 *Id.*

172 *Id.*

EPA would be most likely responsible for designing the system (for setting emissions caps, allocating allowances, deciding which sectors participate in the carbon market *etc.*), while the Department of Energy would play a role in designing a federal carbon market in a way that is consistent with existing energy policies. Additionally, CFTC would have exclusive jurisdiction over commodity futures contracts and commodity swaps contracts, ensuring that the market operates fairly and its participants are not engaged in manipulation or fraud.

III. Key Elements of the Potential U.S. Federal Carbon Market

The first issue in designing a federal carbon market would be to decide on the coverage of the carbon trading system. As previously mentioned, the sectors that contribute the most to the U.S. GHGs emissions are industry, transportation, residential, commercial, and agriculture. Meanwhile, the EU ETS covers sectors such as electricity and heat generation, industrial manufacturing, aviation, and maritime transport. The case of EU ETS shows that in the early phases, the carbon trading scheme should cover only stationary sources. The EU ETS started to cover aviation in 2012 and maritime transport in 2024.[173] The initial version of the EU ETS Directive covered only stationary sources that emitted GHGs.[174] The same approach should be exercised in the U.S. Even though GHG emissions from mobile sources account roughly for 1/3 of the total U.S. emissions, they should be excluded from the coverage of the initial version of the U.S. federal carbon market, because covering transportation-related emissions under the cap-and-trade system poses many challenges.[175] Firstly, emissions come from different types of sources such as passenger vehicles, trucks, rail, aviation, and maritime transport. They differ in terms of emissions rates and fuel efficiency, which poses a challenge in terms of setting a uniform cap on emissions. Secondly, transportation sources are widespread across the U.S. territory and can be counted in millions of individual cars, trucks, ships *etc*. A large number of emitting sources makes it more difficult to monitor GHGs emissions than in the case of stationary sources. Thirdly, transportation sources are in motion. They do not emit GHGs in a permanent location, which makes it harder to measure these emissions. For these reasons, despite a significant contribution to U.S. national emissions, transportation-related emissions should not be covered by

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173 *What is EU ETS?*, Eur. Comm'n, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/what-eu-ets_en [https://perma.cc/4Z9Q-5F3N].

174 *Id.*

175 Mari Elka Pangestu, *Time to decarbonize transport for a green, resilient and inclusive recovery*, World Bank Blogs (Apr. 21, 2021), https://blogs.worldbank.org/en/voices/time-decarbonize-transport-green-resilient-and-inclusive-recovery [https://perma.cc/DRY7-Q9Y2].

the federal carbon market, at least at an initial stage of developing a trading scheme. Moreover, Americans are mostly car-dependent and covering passenger cars' emissions by the cap-and-trade mechanism would directly impact individual citizens and might cause resistance towards the new system. Thus, the U.S. federal carbon system should cover power plants and industry stationary sources.

1. Setting the emissions cap

The emissions cap is the maximum limit of GHGs that could be emitted in the entire U.S. federal system annually. In January 2025, the U.S. formally withdrew from the Paris Agreement.[176] As a consequence, the U.S. does not need to take into consideration the NDCs declared in 2021 under the Paris Agreement when setting the cap. After leaving the Paris Agreement, the cap should be calculated in accordance with new national targets. In this case, methodologies developed by the Supervisory Body could be helpful. According to these standards, the baseline should be determined below "business as usual" levels. If the baseline follows "business as usual" scenario, the emissions will continue to increase without any action. The "business as usual'"approach reflects expected emissions if a country continues its existing policies and technologies. Additionally, U.S. policymakers should take into consideration the technology landscape in each sector. The baseline could use performance-based standards which consider best available technologies that are feasible and environmentally sound, average emission level of the best performing comparable activities, and actual or historical emissions. Performance-based standards can also take into consideration a potential for technological innovation in the future.

After establishing the maximum amount of annual GHGs emissions, policymakers should determine what the annual rate of decrease in GHGs emissions should be (*e.g.*, in the EU ETS, emissions should decrease based on a linear factor of 1.74%).[177] This decision would determine caps in the following years.

Setting a cap requires answering another question: should there be one cap for the whole trading system, or one cap for each sector? The EU ETS Directive sets one uniform cap for the whole system.[178] In case of the U.S., the cap could be roughly split into sector-specific emissions caps and a separate cap for the power generation industry. However, establishing a single uniform cap—similar to the approach

176 Ella Nilsen et al., *Trump signs actions to pull US out of Paris climate agreement, intends to promote fossil fuels and mineral mining*, CNN Climate (Jan. 20, 2025, 7:06 PM), https://www.cnn.com/2025/01/20/climate/trump-paris-agreement-energy-orders/index.html [https://perma.cc/83NW-8R5C].

177 Council Directive 2003/87/EC, *supra* note 1, at art. 9.

178 *Id*.

taken in the EU—would likely be a more effective solution.[179] Firstly, setting one uniform cap provides more flexibility than setting sectoral caps.[180] Sectors are not isolated and changes in one sector, (*e.g.*, in terms of increasing energy efficiency) can affect other sectors.[181] Secondly, setting one cap is more transparent as it is based on the international and national carbon reduction commitments and targets of gradual decrease of GHG emissions. Meanwhile, contrary to a system-wide cap, setting sectoral caps would require assigning shares of the total cap to the sectors that are within a system.[182] Such a decision could raise objections from industry representatives as to the fairness of caps in specific sectors. One system-wide emissions cap should be calculated in a transparent way that does not raise doubts as to its fairness. Thirdly, a common argument in favor of a sectoral emissions caps is that sectoral caps are better tailored and reflect the specificity of a sector. This assumption might be true in less diverse, smaller countries. In 2023, the primary sources for electricity generation in the U.S. were natural gas (43.1%), coal (16.2%), nuclear (18.6%), and renewables (21.4%).[183] The energy mix in the U.S. is diversified and the power generation sector has different characteristics depending on the region.[184] For instance, western states, such as California, Washington, and Oregon produce clean energy from hydropower, wind, solar and nuclear power.[185] On the other hand, states such as Texas, West Virginia, and Wyoming are highly fossil fuel dependent and produce energy bearing high CO2 emissions.[186] Due to significant differences in energy mix across the country, a sectoral cap would not be a better tailored solution. Lastly, setting a total emissions cap still enables allocating free allowances to chosen sectors to mitigate individual challenges the sector is facing.

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179 *Id.*

180 *See* Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 Harv. Env't L. Rev. 293, 312 (2008).

181 *See* Paul E. Brockway et al., *Energy Efficiency and Economy-wide Rebound Effects: A Review of the Evidence and its Implications*, 141 Renewable & Sustainable Energy Revs. 1, 13.

182 *See How cap and trade works*, Env't Def. Fund (Jan. 22, 2020), https://www.edf.org/climate/how-cap-and-trade-works#:~:text=It's%20a%20system%20designed%20to,a%20firm%20limit%20on%20pollution [https://perma.cc/S6QF-GFRU].

183 *Electricity explained: Electricity generation, capacity, and sales in the United States*, U.S. Energy Info. Admin. (July 16, 2024), https://www.eia.gov/energyexplained/electricity/electricity-in-the-us-generation-capacity-and-sales.php [https://perma.cc/Q8Y9-AKKT].

184 *See* U.S. Energy Info. Admin., *supra* note 125.

185 *See* Harry Stevens, *America Needs Clean Electricity. These States Show How to do it*, Wash. Post (Aug. 10, 2023, 11:40 AM), https://www.washingtonpost.com/climate-environment/interactive/2023/clean-energy-electricity-sources/ [https://perma.cc/FGR4-7FVK].

186 *See id.*

2. Allocation of allowances

After setting the cap, U.S. policymakers would have to decide how to allocate the allowances. Typically, one allowance grants the right to produce one metric ton of CO2.[187] In the first phase of the EU ETS, most allowances were allocated for free, but after 10 years, the EU ETS shifted towards auctions as a default rule for obtaining allowances.[188] Moreover, for more than 20 years, free allowances were the main mechanism for preventing carbon leakage.[189] The problem of free allowances allocation is whether sectors not exposed to carbon leakage threats should enjoy the benefit of free allowances. Assuming that the U.S. power generation sector is not exposed to eastern competitors with less stringent carbon policies, the question is: should there be free allowances for GHGs emissions?

There is an argument for both sides. On one hand, allocating free allowances for the power generation sector would be fundamentally against the principle of carbon markets–*i.e.*, the "polluter pays" principle. According to this principle, the entity that pollutes should pay for it.[190] Moreover, taking into consideration the differences in the U.S. power generation sector, a group of U.S. power plants (*e.g.*, nuclear power plants or wind farms) would not need carbon allowances for power generation. At the same time, coal power plants would obtain allowances for free, which would raise doubts as to the fairness of the system and disincentivize power plants to invest in new, cleaner, and more efficient technologies.

On the other hand, imposing carbon costs on power plants could lead to rapidly increasing electricity prices. Free allowances help to mitigate this effect and avoid negative distributional effects of such a policy. The groups most likely to suffer from high electricity prices would be middle class communities.[191] Additionally, allocating free allowances could be a temporary phase that would give the sector more time to adjust and invest in cleaner technologies. To ensure that allowances are not treated as a reward for the most poorly performing stationary sources, obtaining an allowance could be made conditional on meeting *ex-ante* performance-based standards. The EU ETS adopted a benchmarking

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187 *See* FAQ *Cap-and-Trade*, Cal. Air Res. Bd., https://ww2.arb.ca.gov/resources/documents/faq-cap-and-trade-program [https://perma.cc/F79A-N525].

188 Council Directive 2003/87/EC, *supra* note 1, at art. 10.

189 Commission Regulation 2023/956, *supra* note 97, at recital ¶ 11.

190 *The Polluter Pays Principle: Definition, Analysis, Implementation*, OECD (Feb. 26, 2008), https://www.oecd.org/en/publications/the-polluter-pays-principle_9789264044845-en.html [https://perma.cc/M8TH-QF7D].

191 Daniel Gerszon et al., *High energy prices – who is most impacted and why?*, World Bank Blogs (Jan. 4, 2023), https://blogs.worldbank.org/en/opendata/high-energy-prices-who-most-impacted-and-why [https://perma.cc/CB6Q-9C69].

system where the starting point for performance standards was the average performance of the 10% most efficient installations in a sector or subsector in the EU in a given period of time.[192] In the U.S., the Clean Air Act adopted different performance standards for criteria pollutants and hazardous pollutants for sources, depending on a program.[193] The U.S. federal carbon market could adopt similar standards, so that each market participant would have to reach a certain standard to get the free allowances. Separate performance standards could be adopted for coal power plants, natural gas power plants, etc.

In the U.S., the best scenario in the initial phase would be to make auctioning allowances the default rule while granting free allowances to certain sectors—not just those at risk of carbon leakage, like the power generation sector—with a gradual phase-out of free allocations over time. Considering industry groups' aversion to any carbon pricing mechanism, the federal carbon market regulations should give the industry additional time to adjust to the new carbon market.

3. Mechanism ensuring supply and price stability

A mechanism that regulates supply of allowances would be crucial for the U.S. federal market. In the EU ETS, the market stability reserve is of paramount importance, as it adjusts the supply of allowances based on market conditions and prevents excessive price fluctuations.[194] The EU ETS MSR mechanism is transparent. It is primarily automatic as it operates with thresholds defined in the MSR Decision. These thresholds trigger automatic actions– i.e., withdrawing or releasing a predefined number of allowances. The Commission has no discretionary authority to initiate, suspend, withdraw, or halt the withdrawal of allowances.[195] In this way, the MSR ensures the stability of the EU carbon market. Moreover, the MSR regulates placement of a predefined number of allowances in case of excessive price fluctuations.[196] The Commission publishes the total number of allowances in circulation every year as well as the information on the average price of allowances every month and is available to the public.[197] Thus, participants of the EU ETS can predict what is likely to happen in terms of supply and price of allowances.

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192 Council Directive 2003/87/EC, *supra* note 1, at art. 10a(2).

193 *See* Env't Prot. Agency, The Clean Air Act in a Nutshell: How It Works 12–14 (Mar. 22, 2013), https://www.epa.gov/sites/default/files/2015-05/documents/caa_nutshell.pdf [https://perma.cc/29ZH-4MQF].

194 *See Market Stability Reserve*, *supra* note 76.

195 Council Decision 2015/1814, *supra* note 74, at art. 1(6).

196 Council Directive 2003/87/EC, *supra* note 1, at art. 29(a).

197 Council Decision 2015/1814, *supra* note 74, at art. 1(4).

A market-stabilizing mechanism is particularly important in early stages of a carbon market's implementation when the dynamics of the market are not well-established leading to an oversupply or shortage of allowances. If the emissions cap is set too high, it will cause an oversupply of allowances on the carbon market.[198] An oversupply of allowances will in turn disincentivize emission reductions. Moreover, in the early phases, a carbon market is gaining credibility and attracting new participants. If a carbon market is perceived as unstable due price fluctuations or supply instabilities, the participants will not trust that the allowances they auctioned present any value over time. An unstable price of allowances might discourage investments in emissions reduction technologies. For these reasons, the U.S. federal carbon market should establish a transparent market stability mechanism building on the experiences of the EU ETS.

4. Transfer of allowances and linking with cap-and-trade systems

The U.S. federal carbon market must ensure that allowances can be transferred between the participants. A digital platform, on which carbon allowances are auctioned, allocated, and traded, should be established. The U.S. regulation should also allow participants to bank allowances for future use. Participants could strategize and auction allowances for more than one year. Banking allowances allows participants more flexibility in developing carbon strategies.

The U.S. federal carbon market should allow, similar to the EU ETS, entrance into linking agreements with other carbon trading systems. In the U.S., there are already existing carbon cap-and-trade systems, such as the California cap-and-trade system and RGGI. Policymakers will have to decide how these existing schemes will be incorporated into the federal carbon market. California has set more ambitious goals than the U.S. federal government (under the Paris Agreement) in combating climate change, with California making a commitment to reach net-zero carbon emissions by 2045.[199] The federal carbon market should not undermine California's targets. Similar to the Clean Air Act, the regulation of the federal carbon market could serve as a minimum standard.[200]

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198 Appendix E: Setting the Program Emissions Cap, Cal. Air Res. Bd., https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2010/capandtrade10/capv3appe.pdf [https://perma.cc/93M5-4ELF].

199 Cal. Exec. Order No. B-55-18, Edmund J. Brown Jr., (Sept. 10, 2018), https://archive.gov.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf [https://perma.cc/3NR5-MFYP].

200 Under the Clean Air Act, the U.S. Environmental Protection Agency established minimum standards for air quality and assigned primary responsibility to the states to assure compliance with the standards. States are allowed to establish more stringent standards than the standards under the Clean Air Act. The only exception are emissions from mobile sources. The Clean

California should be able to sustain the emissions cap that is more stringent than the national cap. Therefore, one way to integrate California's cap-and-trade system and the federal cap-and-trade system would be to link these two systems. For example, the EU ETS is successfully linked with the Swiss carbon trading system[201], and this agreement could provide insights for a linking agreement in the United States. Moreover, in 2014, California linked its cap-and-trade system with the Canadian province of Québec.[202] In a linked system, participants from both systems could transfer allowances between each other.[203]

An alternative option is to allow California to become a part of the federal carbon market, leaving the authority to set more stringent state-wide emissions caps. However, such an approach raises issues in terms of coordination. It would be crucial to ensure that the federal cap and the state-wide cap are coordinated so that the state-wide cap contributes to the national emissions cap and is not calculated as a separate reduction. Both scenarios bring different issues (*e.g.,* in terms of carbon leakage which will be discussed in the following paragraph). Currently, California is the leader among the U.S. states in combating climate change.[204] Such a positive achievement should not be a reason to exclude California from the federal carbon market. California should be incorporated in the federal carbon market, but also given privileges due to the State's achievements.

5. Carbon leakage

The U.S. federal carbon market needs a mechanism aimed at protecting sectors exposed to the risk of carbon leakage. The EU ETS initially protected sectors at risk of carbon leakage by allocating free allowances for these sectors.[205] After almost 20 years, the EU decided to

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Air Act generally preempts a state from adopting its own emission standards for new motor vehicles or engines, unless the state obtains a waiver. California is the only state that has obtained a waiver and can apply more stringent regulations to emissions from mobile sources. *See* Richard K. Lattanzio, Cong. Rsch. Serv., RL30853, Clean Air Act: A Summary of the Act and Its Major Requirements 1, 10 (2022), https://crsreports.congress.gov/product/pdf/RL/RL30853/31 [https://perma.cc/42C7-RZ57].

201 Council of the E.U. Press Release 793/19, *supra* note 55.

202 Cal. Env't Prot. Agency, Overview Of ARB Emissions Trading Program (Feb. 9, 2015), https://ww2.arb.ca.gov/sites/default/files/cap-and-trade/guidance/cap_trade_overview.pdf [https://perma.cc/9KBP-8QZ8].

203 Facts About the Linked Cap-and-Trade Programs, Cal. Air Res. Bd. (Dec. 1, 2017), https://ww3.arb.ca.gov/cc/capandtrade/linkage/linkage_fact_sheet.pdf [https://perma.cc/C5CR-MTDW].

204 Orkhan Huseynli, *Leading the Way: California's Trailblazing Efforts to Fight Climate Change*, Earth.org (Jan. 4, 2024), https://earth.org/leading-the-way-californias-trailblazing-efforts-in-the-fight-against-climate-change/ [https://perma.cc/EP8S-ZVPD].

205 Commission Regulation 2023/956, *supra* note 97, at recital ¶ 11.

gradually phase-out free allowances for carbon leakage exposed sectors and replace free allowances with CBAM.[206] This mechanism functions in a different way than free allowances. Carbon border adjustment mechanisms do not only subsidize participants within the system by free allowances but also put a carbon price on participants from outside of the system.[207] In this way, all carbon costs are internalized by participants in the system and by the participants operating outside of the system. CBAM covers the production of electricity and specific goods, such as goods containing cement, fertilizers, iron, steel, aluminum, and hydrogen.[208] GHG emissions are embedded in the production of electricity and these goods. Indirect emissions, *i.e.*, emissions arising from the generation of electricity used to produce the goods to which the CBAM Regulation applies, will also be covered by the CBAM Regulation.[209] Without a doubt the U.S. federal carbon market would need protection for sectors that are at risk of carbon leakage.

Firstly, U.S. policymakers would have to identify U.S. sectors that should be offered protection against carbon leakage. Most likely this list would be similar to the EU's list because sectors exposed to carbon leakage share the same characteristics. These sectors are usually energy-intensive and, consequently, carbon-intensive.[210] Moreover, they are trade exposed because the products are traded globally, and carbon costs cause an increase in total production costs.[211] Accordingly, domestic products are less competitive compared to countries where carbon regulations are less stringent.

The next step would be to choose the right strategy to mitigate the risk of carbon leakage. Based on the EU's experience, a proper policy for the U.S. to protect against carbon leakage risks is allocation of free allowances. It is not an optimal strategy because not all carbon costs are internalized, but it offers simplicity and less financial burden on participants of the carbon system. Allocation of free allowances is the right policy for carbon markets that are in early stages of development. Carbon adjustment mechanisms are more sophisticated and more feasible in cases of carbon markets that have been successfully functioning for a certain period. Carbon adjustment mechanisms require adopting additional regulations concerning obligations of actors that operate outside of the carbon market, additional procedures on issuing, pricing, and purchasing CBAM certificates, as well as additional enforcement

206 *Id.* at recital ¶ 12.

207 *Id.* at recital ¶ 12.

208 *Id.* at recital ¶ 32.

209 *Id.* at recital ¶ 19.

210 *Id.* at recital ¶ 7.

211 *See Carbon leakage*, *supra* note 69.

mechanisms.[212] A successful carbon adjustment mechanism needs comprehensive regulation similar to the carbon market regulation. In the EU, CBAM Regulation was adopted as a separate legal act.[213] For these reasons, in the U.S., the right policy would be allocation of free allowances instead of a carbon adjustment mechanism. An alternative to allocating free allowances could be to provide financial subsidies to the sectors at risk. These sectors would still have to participate in auctions, but their carbon costs would be partially mitigated by financial subsidies.

A separate problem, specific to the U.S., is that carbon leakage can occur between U.S. states within a federal carbon market. As already mentioned, states differ in terms of stringency of carbon regulations. For example, California adopted state-wide stringent regulations under its own cap-and-trade system.[214] Depending on how California's system would be incorporated into the federal cap-and-trade system, different scenarios will occur in terms of carbon leakage. If California's carbon market is linked to the federal carbon market, then California will be treated as a third party and a border adjustment mechanism would apply to California. If California's carbon market is incorporated into the federal carbon market, then carbon leakage will occur within the federal carbon market. This problem could be addressed similar to "outside-of-system" carbon leakage. In the EU ETS, CBAM is used to address carbon leakage in international trade – *i.e.*, with actors that originate outside from the EU ETS.[215] In a similar way, carbon border adjustments could be applied to goods imported into states that are part of a federal carbon market. These adjustments would impose additional costs on products imported from states with less stringent carbon policies compared to the state receiving the imports. This mechanism would ensure that industries in states with strong climate policies are not at a competitive disadvantage in comparison to states with more lax carbon pricing. The federal system could also temporarily provide free allowances or subsidies to industries at risk of carbon leakage in states with stringent climate policies.

6. Using offsets

The U.S. federal carbon system could allow offsets in the early stages of functioning. Initially the EU ETS allowed offsets, in particular reductions from the Clean Development Mechanism. However, this approach has changed and currently the EU ETS does not allow

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212 Commission Regulation 2023/956, *supra* note 97, at art. 16–17, 20–22.

213 *See* Commission Regulation 2023/956, *supra* note 97.

214 *See Cap-and-Trade Program*, *supra* note 133.

215 Commission Regulation 2023/956, *supra* note 97, at art. 1(1).

offsets.[216] Such a policy is primarily dictated by the concern about the integrity of offsets. Moreover, allowing offsets could result in a decrease in domestic reductions—reductions that originate inside the EU ETS. The U.S. federal carbon market could allow a limited use of offsets. The federal carbon market would need detailed regulations and requirements on offsets' verification. These regulations would ensure that only high-quality offsets are accepted in the federal carbon market. When adopting standards on monitoring, reporting, and verifying emissions reductions from offset projects, the U.S. federal carbon market could look into standards already developed under the Paris Agreement. During the last CoP29, the CMA adopted guidelines on authorization, verification, and correction of the ITMOs.[217] The U.S. federal market could apply similar standards for offset projects. The main principles of standards adopted by the U.S. could be: (1) information on offset projects and calculations of reductions should be published in a registry that is available to the public; (2) status of offset projects and their results should be tracked and published in this registry; (3) offset projects should be automatically checked for consistency (*e.g.,* whether there is a risk of double counting); (4) offset projects should be reviewed by an independent technical panel in case of any inconsistencies exposed during the automatic check; (5) results of consistency checks and reviews done by the technical panel should be publicly available; and (6) verification process should be designed to establish whether offset projects are additional, permanent and real.

In the U.S., the carbon market cannot rely too heavily on offsets because it could result in less domestic reductions. In order to avoid overusing offset projects, the federal carbon market could set a limit on the amount of emissions that can be offset (*e.g.*, 10% of total emissions). Such a limit would allow participants to use offsets, ensuring that the majority of reductions are achieved domestically.

7. Penalty system

The U.S. federal carbon market would need penalty provisions to ensure its effectiveness. The Paris Agreement contains no penalty provisions, as the emissions reductions targets are voluntary and non-enforceable.[218] Conversely, the EU ETS imposes penalties on participants who fail to surrender enough allowances to cover their emissions. The penalty accounts for 100 EUR per ton of CO2 emitted above surrendered allowances, in addition to the requirement to purchase and

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216 Stephanie La Hoz Theuer et al., Offset Use Across Emissions Trading Systems (2023), https://icapcarbonaction.com/en/publications/offset-use-across-emissions-trading-systems [https://perma.cc/WDB4-RFVF].

217 Decision -/CMA.6, *supra* note 19.

218 Hunter et al., *supra* note 2, at 666.

submit allowances for the excess emissions in the next period.[219] Penalties serve as a strong incentive for compliance with regulations of the carbon market. Without penalties, participants would lack motivation to actively reduce emissions what would undermine the primary goal of a carbon market: combating climate change. A penalty system is also critical in the case of carbon adjustment mechanisms. The EU CBAM imposes similar penalties on the authorized CBAM declarants.[220] Each authorized declarant who fails to surrender enough CBAM certificates will have to pay a penalty of 100 EUR for each ton of excessive emissions.[221] These penalties would ensure that third country producers who export to the U.S. pay a similar carbon price as domestic U.S. producers. Thus, the U.S. federal carbon market should contain penalty regulations for non-compliance with the cap-and-trade mechanism, as well as a carbon border adjustment mechanism.

Conclusion

The Paris Agreement and the EU ETS Directive provide several valuable lessons for the potential future federal carbon market. Firstly, the CMA during CoP29 developed under Article 6.2 details requirements for authorization, reporting and verification of ITMOs. These regulations aim to ensure integrity of carbon offset projects. They could be implemented in the federal carbon market regime if U.S. policymakers allow market participants to use offsets. Secondly, under Article 6.4, the Supervisory Body adopted rules on setting the baseline, which could be used as an inspiration for setting an emissions cap for the carbon market.

The EU ETS is an example of a compliance carbon market, and therefore EU regulations are more easily applicable to the federal carbon market. The EU ETS has been operational for nearly 20 years, offering valuable lessons for newly established carbon markets on the effectiveness of various mechanisms over time. For instance, the U.S. should analyze the shift from allocation of free allowances to auctions and choose the best option based on the experience of the EU. Similarly, U.S. policymakers should analyze the development of the EU ETS in terms of coverage and decide which sectors will participate in the federal carbon market in its early phases.

It should be emphasized that the U.S. is very unique in terms of energy mix in the states, natural resources, and stringency of environmental policies. States differ significantly and mechanisms adopted under the EU ETS should be tailored to address the specificities of the

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219 Council Directive 2003/87/EC, *supra* note 1, at art. 16(3).

220 Commission Regulation 2023/956, *supra* note 97, at art. 26.

221 *Id.*

U.S. market. In this context, the U.S. should cautiously revise the EU ETS's regulations on carbon leakage mechanisms. U.S. policymakers should carefully consider whether California should be integrated into the federal carbon market. Carbon leakage can be also tackled by free allowances. The EU ETS example demonstrates that while free allowances are easier to implement, they are not the most effective solution for preventing carbon leakage.. For this reason, the U.S. should initially address carbon leakage by allocating free allowances. Simultaneously, the U.S. should gradually phase out free allowances and replace them with a form of a border adjustment mechanism.

The analysis of the EU ETS provisions leads to a conclusion that several EU ETS mechanisms could be directly adopted in the U.S., including the market stability mechanism that ensures supply and price stability and the penalty system. Every carbon market requires stability to ensure that participants are motivated to engage in it, and every compliance carbon market needs penalties for non-compliance to fulfil its fundamental role: combating climate change.

The Methane Menace and Policy Politicking: A Case for Comprehensive Carbon Taxes

*Nancy E. Shurtz**

Abstract

In 2021 the United Nations Climate Change Conference ("COP26") produced numerous international group pledges to dramatically reduce emissions that contribute to global climate change. Amongst these was a pledge joined by the U.S., E.U. and over a hundred other nations to reduce global methane discharges by 30% for target year 2030. Most recently, a highlight of the 2023 COP28 conference in Dubai was a first-ever pledge by 50 companies (representing some 40% of global petroleum production) to attain a zero-emission goal for industrial methane processes by 2050. Methane receives less attention than carbon dioxide but is responsible for 30% of global greenhouse gas. Methane emissions are generated by human activity, through various processes such as fossil fuel extraction, industrial chemical conversions, landfill content decay, and agricultural activities. They can also be produced through "natural" (not directly human-caused) processes, such as melting permafrost in arctic and subarctic regions.

In the policy arena, the treatment of methane is representative of the undulating, inconsistent approaches applied across the entire climate-related spectrum. The Biden Administration revamped methane containment policies that had been abandoned by the Trump White House and authorized the Environmental Protection Agency to enforce restrictions attendant to oil and natural gas extraction under the Clean Air Act. Although unsuccessful in passing the Build Back Better Act, President Biden fared better in instituting a "methane fee" as part of the Inflation Reduction Act of 2022. This fee only applies to oil and gas production, is dependent upon the industry to monitor and self-report emissions figures, and earmarks all revenues raised by the fee to go back to the industry players. This is a fledgling step in addressing a very serious long-term threat, and by its meager nature, signals that much more demands to be done, beginning with remedial measures in the United States. This Article will examine the initiatives that various governments have taken in this and broader policy areas and will assess the new methane fee in terms of practicality, economic impact, equity, efficacy and political considerations. The evidence calls for some policy shifts, including establishment of a comprehensive carbon tax.

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Table of Contents

Introduction

It is generally agreed that no "serious scientist" would dispute the assertion that climate change is a real and ongoing global phenomenon.[1] Most nations of the world, particularly those with the world's largest economies, have been unsuccessful in addressing the growing threats posed by this pressing menace.[2] A few countries have achieved narrowly focused successes through market-based initiatives, but most have fallen short of anticipated goals.[3] Despite over 20 United Nations summit conferences, no global interactions have resulted in any binding treaty agreements on greenhouse gas ("GHG") reductions.[4] On the U.S. policy front, Congress has failed to adopt any major carbon

1 *See Do Scientists Agree on Climate Change?,* NASA, https://science.nasa.gov/climate-change/faq/do-scientists-agree-on-climate-change/ [https://perma.cc/2GXG-BCHG]. According to a survey of publishing climate scientists, 97% percent agree that climate change is a reality and that its principal causes are from human activity. Most scientists also believe that as part of these processes, the world environment is approaching several critical "tipping points" at which hazards to the sustainability of human habitation as we know it may become irreversible, with dire consequences all over the planet. *See Earth to reach temperature tipping point in next 20 to 30 years, new study finds*, ScienceDaily (Jan. 13, 2021), https://www.sciencedaily.com/releases/2021/01/210113144456.htm [https://perma.cc/Q2SE-VP7U]; Robert McSweeney, *Explainer: Nine 'tipping points' that could be triggered by climate change*, CarbonBrief, (Feb. 10, 2020), https://www.carbonbrief.org/explainer-nine-tipping-points-that-could-be-triggered-by-climate-change/ [https://perma.cc/7EQL-5Q4N] (stating that "permafrost loss" that releases methane into the atmosphere could accelerate climate change in a dangerous dimension).

2 *See* Alexander Jung et al., *The Warming World: Is Capitalism Destroying Our Planet?*, Spiegel Int'l (Feb. 25, 2015),https://www.spiegel.de/international/world/climage-change-failed-efforts-to-combat-global-warming-a-1020406.html [https://perma.cc/BZ5Q-6WGL]. The author suggests that it is the *type* of capitalism (largely unregulated "free market") that needs to be reshaped to contours that reflect a consciousness of a more restrained stewardship of global resources and human economic activity. *See also* Paul Brown, *World's Richest Nations 'Failing' to Address Climate Change*, Climate Cent. (Jan. 15, 2014), https://www.climatecentral.org/news/richest-countries-failing-to-combat-climate-change-16974 [https://perma.cc/6FEN-WEMS]. While many developed economies have made efficiency gains in aggregate energy use through technology and renewable energy initiatives, others that rely on heavy fossil fuel use to drive their economic engines continue to expand the overall greenhouse gas problem. *See also* Francis X. Rocca, *Pope Francis Calls Global Warming a Threat and Urges Action*, Wall St. J. (June 15, 2015), https://www.wsj.com/articles/papal-draft-faults-most-global-warming-on-human-activity-1434389790 [https://perma.cc/U3BV-QWNN].

3 *See infra* Part II.B.

4 *See* Justin Worland, *What to Know About the Historic 'Paris Agreement' on Climate Change*, Time (Dec. 12, 2015), https://time.com/4146764/paris-agreement-climate-cop-21/ [https://perma.cc/VT8T-6YA2]. A major thrust of the Conference's summary is that while certain emissions reporting requirements are binding amongst participating nations, the actual emissions targets for these same countries are not.

reduction legislation, be it a cap-and-trade system or a carbon tax.[5] However, a methane fee was passed as part of President Joe Biden's Inflation Reduction Act of 2022.[6] Although this measure follows small policy contours, it does illustrate some positive momentum in conveying the message that theoretical concerns for issues as serious as climate change *can* translate to actual legislative action.[7]

Taxation or fees can provide a price signal that might motivate people and industries to change their behaviors or can steer direct investment into new technologies.[8] Tax initiatives can exert a trio of effects on curbing the rate of climate change.[9] First, tax deductions and credits in the income tax system can incentivize desirable behavior.[10]

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5 In the absence of legislative mandates, the Obama Administration illustrated the boundaries of executive reach in this area, being limited to such actions as updating EPA standards, upping climate related research, and calling for voluntary reduction programs relating to GHG emissions. *See infra* Part II.D. On March 28, 2014, President Obama initiated a broad, interagency plan to trim methane emissions. *See* Exec. Off. of the Pres., Climate Action Plan—Strategy to Reduce Methane Emissions (Mar. 2014), https://obamawhitehouse.archives.gov/sites/default/files/strategy_to_reduce_methane_emissions_2014-03-28_final.pdf [https://perma.cc/F5S7-UB7Y].

6 Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818, https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf [https://perma.cc/8WE9-44W9].

7 The emergence of ecological concerns becoming integrated into the mainstream of public policy initiatives is a linchpin of what has come to be known as "transformative governance." This approach (which I find persuasive) characterizes environmental taxation, for instance, as redressing "regrettable consequences of economic development that can be minimized by different attitudes and concerted efforts at environmentally sensitive practices." *See* David G. Duff, *Tax Policy and Global Warming*, 51 Can. Tax J. 2063, 2070 (2003). Duff contrasts transformational approaches to environmental policy with those based on economic responsibility (internalizing external harm costs) or justice/morality orientations (e.g. "the polluter must pay"). He believes the "main purpose of environmental taxes is not to internalize costs or assign blame for environmental harms, but to encourage environmental awareness and shared responsibility for creating a better environmental future." *Id.* On a more basic strategic level, all of these schools of thought involve some level of deliberateness in search of broad-based improvements of sustainable, cleaner economies. These have come to be known as "Blueprint" approaches, since they are part of comprehensive design changes to both economic practices and public policy initiatives. *See* McKenzie Funk, Windfall: The Booming Business of Global Warming, ch. 2 (Penguin Press ed., 2014). Its philosophical contrast has been dubbed a "Scrambles" approach, in which market players react to changes in both the economic and environmental realms on-the-fly to solidify short-term positions, while policy makers are slow (or totally inert) to act on any of the underlying sources of concurrent environmental and economic distress. *Id.*

8 *See* Kenneth R. Richards, *Framing Environmental Policy Instrument Choice*, 10 Duke Env't. L. & Pol'y F. 221, 225 (2000); *see also* Jonathan Baert Wiener, *Global Environmental Regulations: Instrument Choice in Legal Context*, 108 Yale L. J. 677, 677-800 (1999).

9 *See* Stephen Sewalk, *Europe Should Dump Cap-and-Trade in Favor of Carbon Tax with Reinvestment to Reduce Global Emissions*, 5 Wash. & Lee J. Climate, Energy & Env't 355, 364 n.51 (2014).

10 *See* Janet E. Milne, *Environmental Taxation in the United States: The Long View,* 15 Lewis & Clark L. R. 417, 424 (2011); *see also* Stanley S. Surrey, *Tax Incentives as a Device for Implementing Governmental Policy: A Comparison with Direct Government Expenditures,* 83 Harv. L. Rev.

Second, environmental taxes or fees can discourage or punish undesirable practices.[11] Third, revenue generated from environmental taxes can be directed to promote environmental outcomes—such as methane emissions reductions—that combat climate change.[12] This Article explores the methane fee implemented as part of the Inflation Reduction Act of 2022. Ultimately, a properly structured methane fee can be an effective tool to internalize the external costs of excess atmospheric methane gas.[13] However, the provisions of the current fee are grossly inadequate to facilitate significant change.

Part I of this Article will discuss GHG emissions generally with a focus on the immediate methane menace. Part II will examine international, state, local, and U.S. federal methane fee initiatives and include a detailed discussion of the methane fee adopted in the Inflation Reduction Act. Part III will assess this methane fee based on criteria of economic impact, equity, and administrability. Part IV will explore possible modifications to the fee concept and will explore additional initiatives to address the acute methane threat. Lastly, the Article concludes with a call for a consortium of private business, local, national, and international organizations and governments to work in concert to drive decisive action on this issue.[14]

I. Greenhouse Gases & Climate Change

Global warming is caused by GHG emissions trapping heat in the atmosphere.[15] GHGs include carbon dioxide, methane, nitrous oxide and fluorinated gases.[16] Carbon dioxide is the most prevalent GHG, followed by methane.[17] Comparatively speaking, methane remains in the atmosphere for a much shorter period than carbon dioxide, but is capable of trapping

705, 713-38 (1970) (Surrey is of the view that direct subsidies are as good as, if not better than, tax subsidies); Charles D. Patterson, III, *Environmental Taxes and Subsidies: What is the Appropriate Fiscal Policy for Dealing with Modern Environmental Problems?*, 24 Wm & Mary Envt'l L. & Pol'y Rev. 121, 121-159 (2000).

11 *See infra* Part IV.E. *See also* Milne, *supra* note 10.

12 *See infra* Part II.

13 Arthur C. Pigou, The Economics of Welfare (1920).

14 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021, 88 Fed. Reg. 9881 (Feb. 15, 2023), https://www.federalregister.gov/documents/2023/02/15/2023-01575/inventory-of-us-greenhouse-gas-emissions-and-sinks-1990-2021 [https://perma.cc/BJ7J-LQQE].

15 *See* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66496, 66516 (Dec. 15, 2009), https://www.govinfo.gov/content/pkg/FR-2009-12-15/pdf/E9-29537.pdf [https://perma.cc/8GD7-HGQA].

16 *See Understanding Global Warming Potentials,* Env't Prot. Agency, https://www.epa.gov/ghgemissions/understanding-global-warming-potentials [https://perma.cc/N7JY-WQ7R].

17 Steven Ferrey, *The Second Element, First Priority,* 24 B.U. J. Sci. & Tech. L. 41, 42-43 (2019) (noting that methane is the second biggest GHG contributor after carbon dioxide).

more than 80 times the heat on a unit-for-unit basis.[18] Because of its immediate climate impact,[19] many scientists believe that one of the best ways to reduce global warming is to mitigate methane emissions.[20] Unlike with carbon dioxide, promising new technologies exist to reduce this toxic gas, both from the land and in the atmosphere.[21] Climate scientists agree that methane emission reductions represent "one of the fastest and cheapest ways to cool the planet," and offer a temporary window in which to "buy time" to develop effective strategies to reduce other GHG discharges.[22]

A. Methane Emissions In General

Methane is released into the atmosphere through leaks in natural gas systems, the raising of livestock, decaying matter from landfills and natural wetlands, as well as melting permafrost.[23] About 60% of methane emissions in the U.S. result from human activities.[24] Of these, more than 90% come from just three sources: fossil fuels, agriculture, and waste.[25] Globally, some 76% of GHG discharges are carbon dioxide,

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18 Methane is "carbon dioxide on steroids" as it can decay into carbon dioxide and potentially linger in the atmosphere for thousands of years. *See* Gayathri Vaidyanathan, *How Bad of a Greenhouse Gas is Methane?* Sci. Am. (Dec. 22, 2015),https://www.scientificamerican.com/article/how-bad-of-a-greenhouse-gas-is-methane/ [https://perma.cc/2DTQ-NE82]; *See also Understanding Global Warming, supra* note 16 (Carbon dioxide is the reference gas for all other GHGs and has a Global Warming Potential (GWP) rating of 'One'—regardless of time; by contrast, methane carries a GWP of 28-to-36 over a 100-year period).

19 Intergovernmental Panel on Climate Change, Climate Change 2021: The Physical Science Basis, (Methane remains in the atmosphere approximately 12 years before it decays).

20 Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review, 86 Fed. Reg. 63110 (Nov. 15, 2021), https://www.federalregister.gov/documents/2021/11/15/2021-24202/standards-of-performance-for-new-reconstructed-and-modified-sources-and-emissions-guidelines-for [https://perma.cc/46WP-Y64C](citing statement of Intergovernmental Panel on Climate Change, *supra* note 19). According to the International Energy Agency, methane has contributed 30% of GHGs since the Industrial Revolution. *Global Methane Tracker 2024*, Int'l Energy Agency, https://www.iea.org/reports/global-methane-tracker-2024 [https://perma.cc/4FLU-TJGJ].

21 *See infra* Part I.F.

22 Romany M. Webb, *The New Methane Emissions Charge: One (Limited but Important) Stick in the Inflation Reduction Act* (Aug. 23, 2022), https://blogs.law.columbia.edu/climatechange/2022/08/23/the-new-methane-emissions-charge-one-limited-but-important-stick-in-the-inflation-reduction-act/ [https://perma.cc/C4HX-NDHW]; *see also* Aaron Clark & Janet Paskin, *Exclusive Satellite Images Show Methane Cloud Near Jordan Waste Site*, Bloomberg (Nov. 14, 2022), https://www.bloomberg.com/news/features/2022-11-06/-satellite-data-methane-release-climate-change?embedded-checkout=true [https://perma.cc/4CPB-RA2G].

23 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021, *supra* note 14.

24 Nat'l Sci. Found., *Critical Thinking Activity: The Methane Cycle,* https://gml.noaa.gov/outreach/info_activities/pdfs/CTA_the_methane_cycle.pdf [https://perma.cc/8H9R-3SQ7].

25 A. R. Ravishankara et al., Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions (2021), https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions [https://perma.cc/2RFD-CAZN].

followed by methane at 16%.[26] It is estimated that global sources of methane mirror U.S. figures.[27]

In the U.S., carbon dioxide represents an even higher proportion of GHG emissions, accounting for over 79% of the total. Methane discharges amounted to about 11.5%.[28] By stark contrast, nearly half of New Zealand's GHG output comes from methane, owing to that country's large livestock industry, which produces some 85% percent of national annual methane discharge.[29] A growing concern is that nations that are positioned in the northern one-third of the Eurasian and North American continents are witnessing melting permafrost soils, with concomitant release of previously locked methane gas stores into the atmosphere.[30] Permafrost melting is also producing growing adverse human infrastructure effects in these regions.[31] In 2023, it was reported that the nation of Turkmenistan—with one of the largest reserves of natural gas in the world—is emitting gargantuan amounts of methane through leaks in its rapidly-expanding network of natural gas extraction and processing operations.[32]

Natural sources of methane are numerous as well, including wetlands,[33] rivers in the tropics and high latitude regions,[34] as well as the aforementioned permafrost zones.[35] Geological methane emissions are manifested in the Earth's "degassing" activities, which include

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26 *Everything you need to know about greenhouse gases*, Climate Trade (March 16, 2023), https://climatetrade.com/everything-you-need-to-know-about-greenhouse-gases/ [https://perma.cc/8SU7-B6LV].

27 *Id.*

28 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021, *supra* note 14.

29 *See infra* Part II.B (New Zealand's plan to tax methane).

30 Elizabeth M. Herndon, *Permafrost slowly exhales methane,* Nature Climate Change (Mar. 19, 2018), https://doi.org/10.1038/s41558-018-0129-6.

31 The effects of climate change will vary in intensity and extent depending on a particular locale's unique characteristics. When local governments consider climate related policy initiatives, they should be pondered within the contexts of the comprehensive impacts upon the natural and inhabited environments of a jurisdiction. This reveals another critical dimension of the far-reaching impacts of climate change phenomena. *See* Evan Mills, *Climate change, insurance and the buildings sector: technological synergisms between adaptation and mitigation,* 31 Bldg. Rsch. & Info. 257, 271 (2003).

32 Damian Carrington, *'Mind-boggling' methane emissions from Turkmenistan revealed*, The Guardian (May 9, 2023); *see also* Clark & Paskin, *supra* note 22.

33 Wetlands can include marshes, bogs and swamps. Ayesha Tandon, *'Exceptional' surge in methane emissions from wetlands worries scientists,* CarbonBrief (Mar. 20, 2023), https://www.carbonbrief.org/exceptional-surge-in-methane-emissions-from-wetlands-worries-scientists/ [https://perma.cc/J99G-VC22]. Changing rainfall patterns, particularly in the tropics, is expanding the expanse of soil saturation in these regions, increasing the risk of methane gas release.

34 *Mapping Methane Emissions from Rivers Around the Globe Reveals Surprising Sources,* Nat'l Sci. Found. (Sept. 19, 2023), https://www.nsf.gov/news/mapping-methane-emissions-rivers-around-globe#%3A~%3Atext%3DRivers%20and%20in%20boreal%2Cproduce%20substantial%20amounts%20of%20methane [https://perma.cc/4SWU-ALHP].

35 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021, *supra* note 14.

geothermal fields and volcanoes.[36] Lesser sources of this gas emanate from termites, wildfires, and wild animals.[37] These emissions vary across different regions of the planet, but sources not directly related to human activity constitute about 40% of the annual global total.[38]

Overall methane discharges in the U.S. decreased by approximately 17% between 1990 and 2020, marked by a reduction of some 27% from the energy sector.[39] This decrease was due largely to more stringent Environmental Protection Agency ("EPA") reporting standards that required a more thorough accounting of industry monitoring and documentation.[40] However, during this same time frame, emissions increased substantially across other fronts, such as agriculture and landfills.[41] On the world stage, numerous factors have contributed to methane levels "going up faster and faster."[42]

B. Methane Emissions from Oil and Gas

The oil and gas industry represents one of the primary collective sources of methane pollution in the United States.[43] This economic behemoth is composed of five principal segments: natural gas production, oil extraction, transmission and storage, processing, and distribution.[44]

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36 SRON Netherlands Institute for Space Research, *Natural geological methane emissions appear larger than expected*, Phys.org (Mar 10, 2021), https://phys.org/news/2021-03-natural-geological-methane-emissions-larger.html [https://perma.cc/RF4X-9AUY]. Recent research reveals that geothermal features like "mud volcanoes" (some 1100 scattered about the globe) emit more greenhouse gases than previously believed. Approximately 85% of the emission from these structures is methane.

37 *Overview of Greenhouse Gas*, Env't Prot. Agency, https://www.epa.gov/ghgemissions/overview-greenhouse-gases [https://perma.cc/RA7E-PBX5].

38 *Global Methane Tracker 2023*, Int'l Energy Agency, https://www.iea.org/reports/global-methane-tracker-2023 [https://perma.cc/ZK2F-HHC2].

39 Mark Green, *Industry's Significant Record on Reducing Methane Emissions,* Am. Petroleum Inst. (Nov. 30, 2022), https://www.api.org/news-policy-and issues/blog/2022/11/29/industrys%20significant%20record%20on%20reducing%20methane%20emissions [https://perma.cc/STB2-CRJ7].

40 *Id. See infra* note 381.

41 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021, *supra* note 14.

42 Quote is from University of Cincinnati Associate Professor Amy Townsend-Small, who is a leading field researcher in greenhouse gas propagation caused by human activity. *See* Laura Legere, *Q&A: Gassy cows, leaking wells and other adventures in measuring methane*, Phys.org. (Aug. 17, 2021), https://phys.org/news/2021-08-qa-gassy-cows-leaking-wells.html [https://perma.cc/C5LA-7EM4].

43 Jon Coifman, *New Data Show U.S. Oil & Gas Methane Emissions Over Four Times Higher than EPA Estimates, Eight Times Greater than Industry Target*, Env't Def. Fund (July 31, 2024), https://www.edf.org/media/new-data-show-us-oil-gas-methane-emissions-over-four-times-higher-epa-estimates-eight-times [https://perma.cc/YN9B-29H4].

44 *See Estimates of Methane Emissions by Segment in the United States,* Env't Prot. Agency, https://www.epa.gov/natural-gas-star-program/estimates-methane-emissions-segment-united-states [https://perma.cc/8RPL-CWZN].

In 2019, natural gas production accounted for 41% of methane emissions in the oil and gas industry, followed by oil production, transmission and storage, distribution, and processing.[45] Methane is the leading constituent component of natural gas, which is generally extracted by drilling through sedimentary rock formations such as shale or sandstone—once ancient sea beds where organic materials accumulated.[46] From the point of extraction at the wellhead to final delivery of product to consumers, methane emissions are released in the following ways: (1) intentional venting from equipment, (2) unintentional leaks, malfunctions or worker errors, (3) routine maintenance of equipment, and (4) flaring of excess natural gas at petroleum production and refining sites.[47] The EPA estimates that if the natural gas and petroleum systems were combined, they would account for the largest single source of methane emissions, amounting for some 30% of aggregate methane emissions and 3.3% of total GHG discharges in EPA's inventory.[48] The EPA also estimates that approximately 8% of U.S. methane releases emanate from coal mines, both active and abandoned.[49]

C. Methane Emissions from Agriculture

When oil and gas extraction and processing industries are considered as distinct domains, agriculture emerges as the economic sector producing the most methane emissions in the United States. Studies reveal that livestock and farming operations contribute some 37% of methane emissions nationwide, originating principally from enteric fermentation and manure.[50] Other activities contribute smaller but still

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45 *Id.*

46 *The geology of natural gas resources,* U.S. Energy Info. Admin. (Feb. 14, 2011), https://www.eia.gov/todayinenergy/detail.php?id=110 [https://perma.cc/M2BL-YGMQ].

47 Caitlin Stafford, Note, *The Great Escape: Addressing the Problem of Fugitive Methane Emissions from the Conventional Natural Gas System Under the Clean Air Act,* 26 Colo. Nat. Res. Energy & Env't L. Rev. 351, 357-59 (2015). Huge quantities of methane escape from natural gas systems when gas is separated, purified and transported through pipelines. *See*, *e.g.*, Jeffrey S. Rutherford et al., *Closing the methane gap in US oil and natural gas production emissions inventories,* Nature Commc'ns (2021) and Ramon A. Alvarez et al., *Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain,* Sci. (June 18, 2018). For more discussion, *see* Richard K. Lattanzio, Cong. Rsch. Serv., R42986, Methane and Other Air Pollution Issues in Natural Gas Systems (2020).

48 U.S. Env't Prot. Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2021 (2023), https://www.epa.gov/system/files/documents/2023-04/US-GHG-Inventory-2023-Main-Text.pdf [https://perma.cc/SPR8-RJRV].

49 *About Coal Mine Methane,* Env't Prot. Agency, https://www.epa.gov/cmop/about-coal-mine-methane [https://perma.cc/4Y64-WK5Y].

50 U.S. Env't Prot. Agency, *supra* note 48.

significant amounts, such as rice farming.[51] However, rice cultivation worldwide produces up to 12% of methane discharges[52] and is responsible for as much as 15% in some countries in Southeast Asia.[53] Because humans raise animals on an industrial scale, emissions attached to their cultivation are considered human-caused; therefore, public policy is keenly interested in limiting their adverse impacts.

1. Enteric Fermentation

Methane is a natural byproduct of animal digestive processes, generally classified as "enteric fermentation."[54] Cattle and other ruminant animals break down their food, due to its highly fibrous structure, through highly developed digestive systems that ferment foodstuffs that aid in nutritional absorption. However, these unique chemical processes also result in the production of significant quantities of methane discharges.[55]

"Ungulate" animals are four-legged hoofed animals widely distributed around the world. Family members are as diverse as camels and giraffes. Major species bred by humans for meat and dairy products are cattle, sheep, goats, and buffalo. Cattle comprise the largest category of ungulate animals, these both by numbers and by collective weight. It is estimated that there are as many as 1.5 billion domesticated bovids on the planet, collectively weighing in at an estimated 420 million tons, conservatively estimated to outweigh the combined weight of all wild land animals on Earth by a minimum of *eight* times.[56]

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51 *See* Eric Roston, *Inside the Project to Genetically Modify Rice to Emit Fewer Greenhouse Gases*, Time (Jan. 3, 2022), https://time.com/6132369/genetically-modified-rice-methane-emissions/ [https://perma.cc/74TD-KKTU].

52 Karen Mancl, *Rice: A Recipe for Greenhouse Gas Emissions in the U.S. and China?*, NewSecurityBeat (Jan. 17, 2023), https://www.newsecuritybeat.org/2023/01/rice-recipe-greenhouse-gas-emissions-u-s-china/ [https://perma.cc/88E9-WNLT].

53 Alistair Walsh, *How to stop rice fields producing so much methane,* DW (June 30, 2023), https://www.dw.com/en/how-to-stop-rice-fields-producing-so-much-methane/a-65331307 [https://perma.cc/S9YP-WR5L].

54 *Which is a bigger methane source: cow belching or cow flatulence?*, NASA, https://science.nasa.gov/climate-change/faq/which-is-a-bigger-methane-source-cow-belching-or-cow-flatulence/ [https://perma.cc/8MB6-USMG].

55 Brandi Bourg Karisch, *Understanding the Ruminant Animal Digestive System,* Miss. St. U. Extension, https://extension.msstate.edu/publications/understanding-the-ruminant-animal-digestive-system [https://perma.cc/J4LP-4K5P].

56 *See* Elizabeth Pennisi, *Who Rules Earth? Wild Mammals Far Outweighed by Humans and Domestic Animals,* Science (Feb. 27, 2023), https://www.science.org/content/article/who-rules-earth-wild-mammals-far-outweighed-humans-and-domestic-animals [https://perma.cc/7UN5-29A3]. Bovid is defined as a mammal of the cattle family.

North American cattle ranchers produce about 26 billion pounds of beef annually.[57] For the production of one kilogram of beef from a non-dairy cow, the average discharge of methane is a whopping 49 kilograms (CO_2-eq).[58] Virtually all of this methane is produced in the specific environment of the cattle range, with little additional contribution from other sources of the food process, such as transportation.[59] Dairy cattle, in contrast to beef cattle, leave a significantly lighter methane footprint.[60]

2. Manure and Cattle Management

Manure from ruminants emits both methane and nitrous oxide gases. Fecal methane is known to contribute a minimum of one-eighth of the annual global total.[61] In addition to the direct impacts of fecal-related pollutants, the raising of cattle creates additional environmental damage. First is damage to rangeland, from denuding grasses and other plant life that anchor the landscapes to the simple mass of these large animals that further loosen soils and render them vulnerable to wind and water erosion.[62] Second are direct impacts on water resources from

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57 *Cattle & Beef—Statistics & Information,* U.S. Dep't of Agric. Econ. Rsch. Serv. (Jan. 8, 2025), https://www.ers.usda.gov/topics/animal-products/cattle-beef/statistics-information [https://perma.cc/JAQ6-E6MD].

58 *See* Hannah Ritchie, *The carbon footprint of foods: are differences explained by the impacts of methane?*, Our World In Data (Mar. 10, 2020), https://ourworldindata.org/carbon-footprint-food-methane [https://perma.cc/GR23-AZ2K].

59 *See* Ashley Broocks et al., *Tough Questions About Beef Sustainability: Do Feedlots Have the Largest Greenhouse Gas Impact in the Beef Value Chain?*, Beef Rsch., https://www.beefresearch.org/resources/beef-sustainability/fact-sheets/feedlots-greenhouse-gas-impact [https://perma.cc/6NQW-KWTE] (research indicates that the lower food quality of the open range produces more methane in beef cattle than at the feed lot in the "finishing phase.").

60 Ritchie, *supra* note 58 (dairy cows produced an average of 17 kilograms of methane (CO_2-eq) per kilogram of weight—almost one-third that produced by beef cattle).

61 A study of fecal methane stores of dairy cows under relatively cool European conditions produced a minimum of 12% of the total methane produced in the sample. *See* Mohammad Ramin et al., *Enteric and Fecal Methane Emissions from Dairy Cows Fed Grass or Corn Silage Diets Supplemented with Rapeseed Oil*, Nat'l Libr. of Med. (May 5, 2021), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8148109/ [https://perma.cc/2V5W-JP4A]. It is also well-established that beef cattle produce far greater quantities of methane than their dairy counterparts. Ritchie, *supra* note 58.

62 *See* Yong Li et al., *Livestock grazing significantly accelerates soil erosion more than climate change in Qinghai-Tibet Plateau: Evidenced from ^{137}Cs and $^{210}Pbex$ measurements*, 285 Agric. Ecosystems & Env't 1 (Dec. 1, 2019), https://www.sciencedirect.com/science/article/abs/pii/S0167880919302592 [https://perma.cc/67LC-AK2U] (studies of five cattle grazing sites in China revealed soil erosion rates up to 75 times of that which occurred before cattle were introduced into these areas approximately 50 years prior).

depletion of stores through animal consumption and contamination from fecal discharge.[63]

The United Nations Food and Agriculture Organization ("FAO") reported in 2013 that global GHG emissions from cattle alone totaled a whopping 4.6 gigatons (CO_2-eq).[64] Over 60% of this sum was from cattle cultivated for beef production.[65] The specific types of feed given cattle, including its composition and process can significantly impact the final carbon footprint.[66] The FAO derives its international data from the Global Livestock Environmental Assessment Model. Utilizing a combination of direct data compilation, scientific analyses, and remote tools such as satellite imagery, the FAO can issue useful and detailed reports on the state of GHG hazards not only on a regional but also on country-specific bases. For instance, one comparison study concluded that beef production in Latin America (largely due to being mostly grass-fed) produces a carbon footprint more than double that of North American beef.[67]

For most cattle operations around the globe, the leading source of GHG is methane produced from the aforementioned enteric fermentation. In some regions, such as sub-Saharan Africa and portions of South and Southeast Asia, the relative carbon footprint associated with beef cattle is higher than elsewhere due to the low productivity of the cattle stock.[68] Smaller, less robust cattle produce less meat at slaughter, requiring more head of cattle to yield desired quantities of product. In South America, an additional environmental crisis looms, as critical rain forests in the Amazon basin are being burned and cleared for cattle grazing and associated soy cultivation for animal feed.[69]

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63 *See How Grazing Cattle Impact Water,* Ctr. for Biological Diversity, https://grazingfacts.com/water#:~:text=In%20primarily%20grazing%20systems%2C%20cattle,pollute%20groundw%20ater%20from%20chemical%20runoff [https://perma.cc/DGY3-CTGZ] (the beef cattle industry in the U.S. alone consumes over 21 *trillion* gallons of water annually; dairy cows are also big water consumers, requiring an average of five pounds of water to produce one pound of milk).

64 C. Opio et al., *Greenhouse gas emissions from ruminant supply chains: A global life cycle assessment*, Food & Agric. Org. of the U.N., Rome, https://www.fao.org/4/i3461e/i3461e.pdf [https://perma.cc/35FB-MUG6].

65 *Id.* at 21.

66 *See* Diane Nelson, *Feeding Cattle Seaweed Reduces Their Greenhouse Emissions 82 Percent,* UC-Davis Coll. of Agric. & Env't Scis. (Mar. 17, 2021), https://caes.ucdavis.edu/news/feeding-cattle-seaweed-reduces-their-greenhouse-gas-emissions-82-percent [https://perma.cc/G9LE-CK8V] (certain additions to cattle feed have been shown to act as retardants to creation of enteric methane in cows).

67 C. Opio et al., *supra* note 64, at n. 31.

68 *Id*. at n. 20.

69 *What Are the Biggest Drivers of Tropical Deforestation?*, World Wildlife Fund Mag. (Summer 2018), https://www.worldwildlife.org/magazine/issues/summer-2018/articles/what-are-the-biggest-drivers-of-tropical-deforestation [https://perma.cc/276T-8ZAP].

D. Methane Emissions from Landfills & Wastewater Treatment

The third-largest category of methane release in the world is its vast array of landfills and water treatment plants.[70] Refuse and wastewater contain significant amounts of organic compounds which, in the decaying process, emit enormous quantities of contaminants.[71] Landfills are responsible for 17% of total methane emissions generated from human activity in the U.S.[72] A modest number of about 1000 landfills produce the majority of this methane discharge, making these a prime target for new applications of containment measures.[73]

Recent improvements in detection reveal discrepancies between estimated emissions and reality. For example, NASA utilized a new airborne sensor system that revealed California landfills to be releasing methane at six times the EPA estimate.[74] Similarly, a study by Princeton University researchers showed that methane discharges from more than 60 municipal wastewater plants in the U.S. were nearly double what was previously believed.[75]

One of the main drivers of methane production in water treatment facilities is the common employment of anaerobic digesters that break down organic sludge without oxygen.[76] Methane is a major byproduct of these processes, but inefficient anaerobic systems of this type (due to leaks or excessive pressure buildup) allow methane to vent into the atmosphere.[77] Although these systems are employed in less than 10% of treatment plants in the U.S., they tend to be used in the largest capacity operations, accounting for about 55% percent of the total wastewater volume in the nation.[78]

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70 *Scientists say landfills release more planet-warming methane than previously thought*, Associated Press (Aug. 11, 2022), https://www.npr.org/2022/08/11/1116874946/scientists-say-landfills-release-more-planet-warming-methane-than-previously-tho [https://perma.cc/SE3U-73XZ].

71 Zach Winn, *Reducing methane emissions at landfills,* MIT News (Feb. 2, 2022), https://news.mit.edu/2022/loci-methane-emissions-landfills-0202 [https://perma.cc/SN57-Y2BK].

72 Nazli Yesiller et al., *Assessment of methane emissions from a California landfill using concurrent experimental, inventory, and modeling approaches*, 154 Waste Mgmt. 146, 147 (2022), https://www.sciencedirect.com/science/article/pii/S0956053X2200469X#:~:text=U.S.%20landfill%20methane%20e%20missions%20constitute,635%20MMT%20CO2%2Deq [https://perma.cc/3XNZ-NCZF].

73 Winn, *supra* note 71 (identifying a solar-powered vacuum methane capture system by Loci Controls that promises a major advance in methane reduction in these environments).

74 *Id.*

75 Colton Poore et al., *Wastewater sector emits nearly twice as much methane as previously thought,* Princeton Eng'g (Feb. 28, 2023), https://engineering.princeton.edu/news/2023/02/28/wastewater-sector-emits-nearly-twice-much-methane-previously-thought [https://perma.cc/SX7M-JJCT].

76 *Id.*

77 *Id.*

78 *Id.*

Another significant source of methane discharge takes the form of "sewer gas," created from a slurry of organic compounds which, when mixed with water from storm drain off, creates an environment from which GHGs—and methane in particular—develops and releases into the atmosphere.[79] In addition to methane, these toxic environments can produce emissions of other undesirable gases, including ammonia, sulfur dioxide, and hydrogen sulfide.[80] The U.S. has more than a million miles of sewers hosting myriad compounds, of which methane is a major constituent.[81]

E. Methane Emissions from Natural Sources

Natural sources of methane include wild animals, wetlands, non-commercial natural gas deposits, termites, undersea clathrates, wildfires, and permafrost.[82] The geographic distribution of methane stores is vast, ranging from the boreal forests of Siberia and northern Canada to the tropical wetlands of the Amazon and Congo River systems.[83] Because of the myriad sources of methane, direct regulation of emissions is a daunting task at best.[84]

Permafrost, which is composed of frozen rock and soil, covers about a quarter of the non-glaciated landforms of the Northern Hemisphere, including Scandinavia, Russia, Alaska, Canada, and the Tibetan plateau.[85] Slivers of permafrost exist in the Southern Hemisphere, mostly in Antarctica, New Zealand's Southern Alps, and the highland areas of Patagonia in South America.[86] The Intergovernmental Panel on Climate Change ("IPCC") found evidence of permafrost melt, driven by an increase in temperature globally by a minimum of over one-degree

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79 Quantification and Modelling of Fugitive Greenhouse Gas Emissions from Urban Water Systems 2-5 (Liu Ye et al. eds., 2022) [https://perma.cc/B9V7-527G]; Yiwen Liu et al., *Methane emissions from sewers*, 524 Sci. of the Total Env't 40 (Aug. 15, 2015), https://www.sciencedirect.com/science/article/abs/pii/S0048969715004659 [https://perma.cc/7446-KG4G].

80 Nick Gromicko, *Sewer Gases in the Home,* Int'l Ass'n of Certified Home Inspectors, https://www.nachi.org/sewer-gases-home.htm [https://perma.cc/DK3Y-PKZ4].

81 Poore et al., *supra* note 75.

82 Nat'l Sci. Found., *Critical Thinking Activity: The Methane Cycle*, https://gml.noaa.gov/outreach/info_activities/pdfs/CTA_the_methane_cycle.pdf [https://perma.cc/98DV-7WKW].

83 Fiona M. O'Connor, et al., Possible role of wetlands, permafrost, and methane hydrates in the methane cycle under future climate change: A review, 48 Revs. of Geophysics RG4005 (Dec. 23, 2010), https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2010RG000326 [https://perma.cc/6QCZ-JUQS].

84 This gives thrust to policy approaches that attack the greenhouse gas problem in comprehensive terms, such as through a carbon tax. *See infra* Part IV.D.

85 *Frozen Ground & Permafrost*, Nat'l Snow & Ice Data Ctr., https://nsidc.org/learn/parts-cryosphere/frozen-ground-permafrost [https://perma.cc/E4TN-4CSG].

86 McSweeney, *supra* note 1.

Celsius since 1900.[87] An accelerating melt rate is losing some 1.5 *trillion* tons of methane into the atmosphere annually.[88] Because of the vastness of the methane stores around the globe, widespread permafrost melt could constitute a particularly devastating "tipping point" for habitation on the planet.[89]

F. Technologies & Related Measures

Promising new technologies are emerging in the battle to mitigate the effects of methane inundation. On the agricultural front, for instance, manure management techniques have improved, including feed mixtures that reduce methane production in cattle.[90] Soil-based methane absorption strategies are also being aggressively explored,[91] and we have seen advances in gas capture systems in landfill sites.[92]

Research in the academia and business realms is blazing new trails in the development of technologies and strategies to combat the explosive growth in methane emissions. In the laboratory setting, a clay compound called zeolite (commonly used in kitty litter) has been discovered to possess methane-absorbing properties.[93] In the business arena, new firms offer products aimed at methane abatement, including a company that provides seaweed additives for cattle feed to reduce enteric fermentation in cows (Blue Ocean Barns), a firm that specializes in sealing leaks in natural gas and oil wells (Biosqueeze, Inc.), and

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87 *Climate change widespread, rapid, and intensifying – IPCC,* Intergovernmental Panel on Climate Change (Aug. 9, 2021), https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/ [https://perma.cc/Z7U9-ZCQP].

88 *See* Jordan Wilkerson, *How Much Worse Will Thawing Arctic Permafrost Make Climate Change?*, Sci. Am. (Aug. 11, 2021), https://www.scientificamerican.com/article/how-much-worse-will-thawing-arctic-permafrost-make-climate-change/ [https://perma.cc/L2HY-7CYA] (one of the dire messages of this article is that the scope of this threat, though significant, is still not firmly known at this time.).

89 McSweeney, *supra* note 1.

90 Nelson, *supra* note 66. Feed additives show promise in reducing enteric fermentation in cattle, but exploration is still in early stages of testing.

91 Facilitating an increased role for microbes known as *methanotrophs* is a major focus on research. These organisms consume methane naturally, but at a rate currently slower than the influx of methane into the atmosphere. *See* Katherine Bourzac, *Capturing Methane from the Air Would Slow Down Global Warming. Can It be Done?*, ScienceNews (Nov. 28, 2023), https://www.sciencenews.org/article/methane-capture-air-global-warming-climate [https://perma.cc/VUX7-2HYR].

92 Winn, *supra* note 71.

93 When the zeolite clays were heat-treated with an infusion of copper, methane gas was successfully converted to carbon dioxide, accelerating the process that methane undergoes naturally over the course of 12-to-14 years in the atmosphere. *See* David Chandler, *A Dirt Cheap Solution? Common Clay Materials May Help Curb Methane Emissions*, Civil & Env't Eng'g (Jan. 10, 2022), https://cee.mit.edu/a-dirt-cheap-solution-common-clay-materials-may-help-curb-methane-emissions/#%3A~%3Atext%3DWith%20special%20treatment%2C%20minerals%20called%2Cits%20presence%20in%20the%20atmosphere [https://perma.cc/XJ5A-9PWL].

an optics developer that designs high-resolution spectral equipment for atmospheric analysis from space (Wyvern). On the establishment side of the ledger, international dairy giant Danone recently announced an ambitious plan in partnership with the Environmental Defense Fund to develop and implement methane mitigation strategies at every stage of its production process, aiming to reduce its methane footprint by 30% by 2030.[94]

II. International & U.S. Climate Change Initiatives

Over the past several decades, an uneven mix of local, regional, national, and international efforts have focused attention on remedial efforts to combat climate change. The earliest global initiative to connect environmental concerns to comprehensive economic development strategies was the 1992 United Nations Conference on Environment and Development in Rio de Janeiro.[95] This conference's most meaningful action was the establishment of 1992's United Nations Framework Convention on Climate Change ("UNFCCC") as its principal vehicle for designing cooperative strategies to arrest anthropogenic contributions to climate change.[96] Participation in discussions to limit the release of a host of harmful agents has grown over the years, but collective agreements are regarded mostly as triumphs of diplomacy rather than meaningful advances in global environmental and development policies.[97] Leading economic players, such as the U.S., have an inconsistent record on greenhouse gas policy as well as other global concerns, such

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94 Katie Anderson, *Danone commits to cut dairy methane emissions in partnership with farmers and EDF*, Env't Def. Fund (Jan. 17, 2023), https://business.edf.org/insights/danone-commits-to-cut-dairy-methane-emissions-in-partnership-with-farmers-and-edf/ [https://perma.cc/C2PQ-A6D5] .

95 This Conference came to be known as the "Earth Summit" and addressed several other areas of concern attached to goals of sustainable global economic development. Besides its well-publicized focus on climate change, another chief action of the Conference was establishment of the Convention on Biological Diversity. *See History of the Convention*, Convention on Biological Diversity (May 1, 2025), https://www.cbd.int/history [https://perma.cc/WKX8-JP2P].

96 In turn, this spawned the process of ongoing negotiations amongst member nations, culminating in a series of action plans presented for endorsement by signatories to the Convention. in efforts for aggregate reductions in the emission of harmful greenhouse gases. *See What is the United Nations Framework Convention on Climate Change?*, U.N. Climate Change, https://unfccc.int/process-and-meetings/what-is-the-united-nations-framework-convention-on-climate-change [https://perma.cc/6VQ2-HJJR].

97 *See* Lindsay Maizland, *Global Climate Agreements: Successes and Failure,* Council on Foreign Rels. (Dec. 5, 2023). International agreements, such as those adopted in the Kyoto, Copenhagen, Paris, and Dubai accords, generally acknowledge the scientific validity behind the causes of climate change. They set appropriate targets for limiting aggregate greenhouse gas emissions, but diverge widely on methods of measurement, which parties need to adopt more aggressive limitation strategies and determine whether non-polluting players should receive economic compensation for climate-caused damage.

as the state of the oceans and the preservation of biological diversity.[98] This fickle track record may provide insight as to why America has failed to adopt far-reaching, economically-based environmental policies, such as comprehensive carbon taxes or cap-and-trade regimes.[99] It also may explain why the U.S. has only recently instituted a very limited and ineffective methane charge.[100]

In the months before *three* of the most recent COP conferences (2021-23), widely disparate portions of both Northern and Southern Hemispheres experienced record-shattering heat waves, massive wildfires, and historically destructive storms.[101] Even in advance of the year-end climate summit in Dubai, the year 2023 was already known to be the warmest on record—and by an alarming margin.[102] With the memories of a broad swath of climate-related disasters in the minds of a global audience, there was considerable anticipation about the character and content of the 2023 global climate conference ("COP28").

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98 *See* Tara Lohan, *4 Major Environmental Treaties the U.S. Never Ratified—But Should Have,* The Revelator (Aug. 2, 2021), https://therevelator.org/environmental-treaties/ [https://perma.cc/53L5-TVS6].

99 *See* Hugo Dixon, *How to crack the climate free rider problem,* Reuters (July 10, 2023), https://www.reuters.com/breakingviews/how-crack-climate-free-rider-problem-2023-07-10/ [https://perma.cc/925Z-N7FR] (big economic players are often reluctant to adopt aggressive internal environmental policies because competitors may profit from the aggregate benefits of such policies without contributing to the costs of their implementation; hence, the "free-rider" label).

100 *See infra* Part III.

101 *See* Jeff Masters, *The top 10 global weather and climate change events of 2021,* Yale Climate (Jan. 11, 2022), https://yaleclimateconnections.org/2022/01/the-top-10-global-weather-and-climate-change-events-of-2021/ [https://perma.cc/TZ3A-223L] (2021 produced historic summer temperature records in the U.S. Northwest and Western Canada, widespread record rain and flood events in China, and massive wildfires in Siberia's taiga forests. 2022 saw Florida's Gulf Coast ravaged by Hurricane Ian, deadly summer floods in Pakistan, and widespread drought conditions in East and Sub-Saharan Africa); *see also* Ctr. For Rsch. on the Epidemiology of Disasters, 2022 Disasters in Numbers: Climate in Action (2023), https://www.cred.be/sites/default/files/2022_EMDAT_report.pdf [https://perma.cc/9XRL-F737] (2023 witnessed more of the same, including deadly flooding in Pakistan, wildfires in Greece, and a rare intense Mediterranean cyclone (Storm Daniel) that killed thousands in Libya); *see also* A.L. Lee, *World experienced nature's fury in 2023 as climate crisis fueled bad weather*, UPI (Dec. 18, 2023), https://www.upi.com/Top_News/World-News/2023/12/18/2023-weather-events-climate-crisis/3241702551812/ [https://perma.cc/W6XT-VXTQ].

102 *2023 was the world's warmest year on record, by far: Antarctic sea ice coverage hit record low*, Nat'l Oceanic & Atmospheric Admin. (Jan. 12, 2024), https://www.noaa.gov/news/2023-was-worlds-warmest-year-on-record-by-far [https://perma.cc/X4F4-29VC] (these results were well-anticipated, due largely to the steady development of a warm-water El Niño pattern in the equatorial Pacific).

A. International Climate Change Conferences Have Produced Few Effective Results

From the groundbreaking consortium of the Rio United Nations convention that produced the first collective agreement on combating the causes of climate change,[103] public attention has been largely focused on affirmative responses to the growing consensus that cooperative policy strategies are required to mitigate the climatic effects of anthropogenic GHG concentrations.[104] While it can be argued that endorsement of aspirational goals by over 175 nations is itself a laudable achievement, the vague nature of the Convention's "guiding principles" for future action set a precedent for subsequent global congregations.[105] Successive global conventions have created ever more ambitious mission statements while providing virtually no concrete nor legally binding paths for achieving environmentally effective policy goals.[106]

Five years after the foundational Rio objectives were adopted, the first operational mandates of the UNFCCC were issued in Kyoto, Japan in December, 1997.[107] In short, the core of the Protocol set forth national emission reduction targets for developed nations, based on long-term evidence that these parties have been responsible for the majority of

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103 United Nations Framework Convention of Climate Change, INC/FCCC 5th Sess., 2d Part, at Art. I, U.N. Doc A/AC.237/18 (Part II) (May 9, 1992), https://unfccc.int/documents/951 [https://perma.cc/2KVR-9F3M].

104 *Id.* at art. 2. One of the Convention's stated goals is to limit "dangerous anthropogenic interference with the climate system." However, schedule agendas for assertive action are conspicuously vague. The Convention's guiding statement declares only those broad objectives "should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner."

105 Jean-Frederic Morin et al., *The survival of the weakest: the echo of the Rio Summit principles in environmental treaties*, Env'T Politics (2023), https://www.chaire-epi.ulaval.ca/sites/chaire-epi.ulaval.ca/files/publications/the_survival_of_the_weakest_the_echo_of_the_rio_summit_principles_in_environmental_treaties.pdf [https://perma.cc/6J6C-F7UC].

106 *See* Sir Geoffrey Palmer, *The Earth Summit: What Went Wrong at Rio?*, 70 Wash U. L. Q. 1005, 1007-08 (1992). Palmer, former Prime Minister of New Zealand, also served as Minister of the Environment for that country. He contends that while the Rio Convention succeeded in having "substantially raised the level of environmental consciousness around the world," it was equally deficient by not establishing the "necessary structural adjustments" for meaningful collective remedial action.

107 *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change 3 (1998), https://unfccc.int/resource/docs/convkp/kpeng.pdf [https://perma.cc/Z9CE-FHG9] [hereinafter Kyoto Protocol].

GHG increases in the atmosphere.[108] The emission reduction targets[109] were to be met over two "commitment periods," the first of which covered the period from 2008-2012.[110] Even though initially agreed upon by its signatories in 1997, protracted ratification processes of many members to the Convention delayed the Protocol from taking effect until February 2005.[111] The United States was conspicuously absent as a ratifier of the treaty, as President George W. Bush rejected American participation in the accord, claiming its provisions, including specific GHG reduction targets, would hurt the U.S. economy.[112] Similarly, Canada, which had originally ratified the Kyoto treaty in 2002, withdrew after Conservative Prime Minister Stephen Harper's government announced that the oil-rich nation could not satisfy its targeted GHG reductions and would be unwilling to be sanctioned for not meeting them.[113]

These discouraging events were reinforced in December 2012 by a follow-up to the Kyoto accords known as the Doha Amendment.[114] This accord, adopted by the Convention's three-quarter endorsement threshold, established a second commitment period to extend from 2013 through 2020.[115] Although the scale of participation of parties involved in GHG reduction efforts was formally expanded to include emerging economies, the withdrawal of major players such as Russia, Japan, and

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108 Some thirty-seven industrialized economies plus members of the European Union (the group known as 'Annex I') were earmarked for targeted GHG reductions. *See What is the Kyoto Protocol?*, U.N. Climate Change, https://unfccc.int/kyoto_protocol [https://perma.cc/BA2R-3WU6].

109 *Id.* (initial targets amounted to a five-percent average GHG reduction compared to 1990 levels).

110 *See Kyoto Protocol—Targets for the First Commitment Period*, U.N. Climate Change, https://unfccc.int/process-and-meetings/the-kyoto-protocol/what-is-the-kyoto-protocol/kyoto-protocol-targets-for-the-first-commitment-period [https://perma.cc/5D4R-U87Q] (targets were applied to the six principal greenhouse gas types: Carbon dioxide, Methane, Nitrous oxide, Hydrofluorocarbons, Perfluorocarbons, and Sulphur hexafluoride).

111 *Kyoto and Beyond: Kyoto Protocol FAQs*, CBC News (Feb.14, 2007), https://www.cbc.ca/news2/background/kyoto/ [https://perma.cc/3VUK-WN3H]. At the time of its effective implementation, 141 countries had ratified the accord.

112 *See* Julian Borger, *Bush Kills Global Warming Treaty,* The Guardian (Mar. 29, 2001), https://www.theguardian.com/environment/2001/mar/29/globalwarming.usnews [https://perma.cc/PMH3-4NMF] (if the U.S. had ratified the treaty, its provisions called for a seven-percent reduction of GHGs from 1990 levels by 2012. Bush opposed the treaty partly because he objected to exemptions from emissions reduction mandates for developing nations).

113 *Canada Pulls Out of Kyoto Protocol,* The Guardian (Dec. 12, 2011) (environment Minister Peter Kent echoed a popular objection for non-participants in the Protocol, pointing that the GHG reduction mandate "does not cover the world's largest two emitters, the United States and China, and therefore cannot work.").

114 United Nations Framework Convention of Climate Change, s*upra* note 103.

115 *Id.*

New Zealand from the second commitment period meant that less than 12% of global emissions were covered by the updated accord.[116]

In the wake of the defections from previous collective agreements with binding conditions, the UNFCCC reset its approach to emphasize consensus building, the seeds of which were planted after the COP17 conference in Durban, South Africa.[117] The Durban Platform for Enhanced Action[118] set the process by which a new climate agreement—one with firm but flexible terms—could garner universal Conference endorsement by 2015.[119] This set the stage for the much-publicized COP-21 in Paris. This Conference, held in December 2015, culminated years of negotiations designed to secure commitments to climate control goals by all the major GHG emitters.[120] The final Paris Agreement established several new standards in its terms. It set five-year cycles for implementation of individual nations' climate action plans, known as Nationally Determined Contributions ("NDC").[121] It formalized the long-term goal of keeping global average warming "well below" 2ºC above pre-industrial levels and setting a 1.5ºC limit as the collective goal.[122] It also made a priority for Conference members to emphasize climate adaptation, which involves contingency planning for such climate-related phenomena as sea level rise, prolonged droughts, storms, and floods.[123]

The process of arriving at the language of the final document as well as the content of countries' climate pledges was at times contentious.[124] India, for instance, insisted that it could not execute GHG reductions in its first five-year NDC period without excessively hurting its economy,

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116 *See* Andrew Light et al., *Doha Climate Summit Ends with the Long March to 2015,* Ctr. for Am. Progress (Dec. 11, 2012), https://www.americanprogress.org/article/doha-climate-summit-ends-with-the-long-march-to-2015/ [https://perma.cc/GS9H-FDNW] (these non-participants in the second commitment period stated familiar reasons, principally that the largest GHG emitters either declined participation (U.S.) or were exempt (China, India) from the terms of the accord).

117 A new multilateral negotiating framework was approved here, including three of the GHG emitters: The U.S., China and India. *See* Daniel Bodansky, *The Durban Platform Negotiations: Goals and Options,* Harv. Belfer Ctr. (July 2012), https://www.belfercenter.org/publication/durban-platform-negotiations-goals-and-options [https://perma.cc/J5DM-S7T3].

118 Scientific guidance for the consensus agreement would be guided by the Fifth Assessment Report of the IPCC. *Essential Background—Durban Outcomes*, U.N. Climate Change, https://unfccc.int/process/conferences/the-big-picture/milestones/outcomes-of-the-durban-conference [https://perma.cc/KKJ6-7V6A].

119 *Id.*

120 Bodansky, *supra* note 117.

121 *What Is the Paris Agreement?*, U.N. Climate Change, https://unfccc.int/process-and-meetings/the-paris-agreement [https://perma.cc/LCA7-Q8R4].

122 *Id.*

123 *Id.*

124 The United States objected to one clause in an Agreement clause that read "shall" and insisted that "should" be inserted. *See* Daniel Bodansky, *The Legal Character of the Paris Agreement,* 25 Rev. Eur. Cmty. & Int'l Env't L. 142, 149 (2016), https://onlinelibrary.wiley.com/doi/pdf/10.1111/reel.12154 [https://perma.cc/J5CP-S32A].

but pledged to lower its emissions intensity.[125] Nearly 200 countries signed the document, which took effect after ratification by countries that represented 55% of GHG emissions.[126] Because of such wrangling over language that may constitute an enforceable obligation, one international law expert labeled the Agreement "a statement of good intentions."[127] Soon to follow would be actions with bad intentions.

A mildly optimistic air followed the widespread public endorsement of the Paris Accord.[128] Then, just months after taking office in 2017, U.S. President Donald Trump announced America's withdrawal from the Agreement, stating flatly: "The Paris Accord is very unfair at the highest level to the United States."[129] Since the U.S. was already the number-two GHG producer in the world, this put a damper on the short-lived enthusiasm for climate prospects.[130] Climate statistics would again send an ominous message.

Shortly before the COP26 meetings in Glasgow, Scotland in October 2021, the IPCC issued the first part of its Sixth Assessment Report,[131] which concluded that because of the failure of big GHG emitters to meet their NDC goals, it is likely that warming will exceed 1.5ºC during the 21st century.[132] The global COVID-19 pandemic had wreaked economic havoc, and big coal users, India and China, announced that associated economic slowdowns were bringing delays in their efforts to transfer

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125 *See* Pushpa Kumar Lakshmanan et al., *The Paris Agreement on Climate Change and India,* 3 J. Climate Change 1 (2017) (India is the third-biggest GHG emitter in the world and 75% of its emissions come from its energy sector. The country's negotiators argued that India can simultaneously grow its economy and develop clean technologies, lowering its reliance on fossil fuels), https://journals.sagepub.com/doi/abs/10.3233/JCC-170001 [https://perma.cc/Q4PU-GDMY].

126 *Paris Agreement—Status of Ratification*, U.N. Climate Change, https://unfccc.int/process/the-paris-agreement/status-of-ratification [https://perma.cc/WMN8-TDXF].

127 Bodansky, *supra* note 124, at 142.

128 *See* Ross J. Salawitch et al., Paris Climate Agreement: Beacon of Hope (2017) (one of the conclusions of this scholarly analysis of data and technical capabilities is that if the major emitters of GHGs were to meet their NDC pledge targets under the Accord, there is a good chance to keep additional climate warming under the two-degree (Celsius) level).

129 Kevin Liptak & Jim Acosta, *Trump on Paris accord: "We're getting out',* CNN (June 2, 2017), https://www.cnn.com/2017/06/01/politics/trump-paris-climate-decision/index.html [https://perma.cc/2QVG-TMPH].

130 Jonathan Watts & Kate Connolly, *World leaders react after Trump rejects Paris climate deal* (June 1, 2017), https://www.theguardian.com/environment/2017/jun/01/trump-withdraw-paris-climate-deal-world-leaders-react#%3A~%3Atext%3DThe%20unyielding%20response%20of%20Italy%2Cto%20be%20outside%20the%20agreement [https://perma.cc/2SU8-MRNZ] (Japan's Minister of Environment stated widespread international sentiment: "It's as if they've [U.S.] turned their back on the wisdom of humanity. In addition to being disappointed, I'm also angry.").

131 Intergovernmental Panel on Climate Change, *supra* note 19, at ix.

132 *Id.* at v (The 6th Assessment Report stated: "In 2019, atmospheric CO_2 concentrations were higher than at any time in the last 2 million years . . ., and concentrations of CH_4 and N_2O were higher than at any time in at least 800,000 years . . .); *Id.* at 7.

energy and industrial needs to cleaner sources.[133] Aside from an urging from UNFCCC leadership that the Conference members meet their NDC goals, little of substance emerged from COP26.[134] Of the few areas that showed positive movement, two stood out. One was the "Global Methane Pledge," in which 159 committed to reduce worldwide methane emissions by 30% by 2030.[135] A second new pledge signed by over 100 countries (including big GHG emitters China, the U.S., and Russia) promised to reverse global deforestation by 2030 and backed the effort with an initial financial pledge of $19 billion.[136]

The deforestation pledge follows a largely unsuccessful initiative taken up originally in 2007 (and modified in 2013) known as Reducing Emissions from Deforestation and Forest Degradation ("REDD+").[137] The idea behind REDD+ is to save vital tropical rainforests by rewarding less-developed nations who preserve these resources with funds from developed nations, the proceeds of which can be used for forest enhancement and economic development efforts.[138] The currency of the program issued by the Forest Carbon Partnership Facility (an agency of the World Bank) is a nebulous credit called a "REDD+ Results Unit" ("RRU").[139] The RRUs can be purchased by nations to satisfy their NDC pledges, but they are *not* marketable carbon credits.[140] There is no real incentive for rich developed nations to invest significantly in the

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133 *See* Sarita Chaganti Singh, *Exclusive: India, China propose 'multiple pathways' on cutting use of fossil fuels*, Reuters (May 2, 2023, 8:07 AM), https://www.reuters.com/world/india-china-propose-multiple-pathways-cutting-use-fossil-fuels-sources-2023-05-02/ [https://perma.cc/6UXW-MKYU]. India and China would later suggest defining a pathway to weaning themselves off of coal, rather than trying to adhere to time deadlines they cannot meet. India employs coal in 75% of its electrical energy plants.

134 *COP26: Together for our planet*, U.N. Climate Action (Nov. 13, 2021), https://www.un.org/en/climatechange/cop26 [https://perma.cc/PEW8-H8DG] (137 members of the Conference signed onto the forest preservation initiative).

135 *See About the Global Methane Pledge*, Climate & Clean Air Coal., https://www.globalmethanepledge.org/ [https://perma.cc/Z4JT-QTNJ] (meeting the 2030 methane reduction goal is estimated to slow the warming gradient by 0.2ºC by 2050).

136 *See* Georgina Rannard & Francesca Gillett, *COP26: World leaders promise to end deforestation by 2030*, BBC (Nov. 2, 2021), https://www.bbc.com/news/science-environment-59088498 [https://perma.cc/MDR7-F4GN].

137 *What is REDD?*, U.N. Climate Change, https://unfccc.int/topics/land-use/workstreams/redd/what-is-redd#%3A~%3Atext%3DCountries%20established%20the%20%27REDD%2B%27%20framework%2Cforest%20degradation%20in%20developing%20countries [https://perma.cc/R82S-TDYP].

138 Sophie Bertazzo, *What on Earth is 'REDD+'?*, Conservation Int'l. (Mar. 28, 2019), https://www.conservation.org/blog/what-on-earth-isredd#%3A~%3Atext%3DAt%20the%20moment%2C%20money%20for%2Cto%20get%20in%20on%20this [https://perma.cc/2VL5-P32K].

139 *See* Rainforest Found. UK, Credis Where They Are Not Due: A Critical Analysis of the Major REDD+ Schemes (July 2023), https://www.rainforestfoundationuk.org/wp-content/uploads/2023/07/Carbon-Credits_final_ENG.pdf [https://perma.cc/EU28-G49U].

140 *Id.*

program because satisfying their NDC pledges is essentially a voluntary endeavor.[141] With no true "carbon market" in place, revenue generation for the cause has been disappointingly low.[142]

COP26 was widely viewed to have left leading priorities in limbo.[143] This included the failure of most member states to have ratcheted their five-year NDC pledges to more aggressive postures to meet 2030 GHG goals.[144] Leaders hoped that COP27 in Sharm El-Sheikh, Egypt would achieve a more ambitious agenda. Since 1991, representatives of less-developed nations have advocated for compensation from wealthy industrial nations for irreversible climate-related harms visited upon their lands and people.[145] After over thirty years, the Conference authorized creating a funding regime for "Loss and Damage" compensation.[146] However, no funding apparatus was endorsed. On other key issues, a declaration calling for an eventual phaseout of industrial-scale coal and petroleum fuels was watered down to endorse greater use of low emission energy.[147] Aside from Australia and the European Union, both of which accelerated their NDC pledge schedules, none of the biggest GHG emitters significantly increased their reduction pledges.[148]

An air of anxiety permeated the atmosphere at the outset of the COP28 Conference. Some of the tension emanated from the fact that the host country—the United Arab Emirates ("UAE")—is a wealthy petrostate. Moreover, Conference president Sultan Ahmed al-Jaber is not only the UAE's Minister of Industry and Finance, but also the head of the Abu Dhabi National Oil Company.[149] A second source of uncertainty hovered around funding for the "Loss and Damage" program for developing countries that was approved at the previous year's

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141 *See* Climate L. & Pol'y, Booklet: Understanding the safeguard requirements of REDD. Plus: a Tool for Indigenous Peoples & Local Communities, https://climatelawandpolicy.com/_userfiles/pages/files/redd_plus_booklet_final_2.pdf [https://perma.cc/C48U-3A9U].

142 Carol J. Clouse, *The U.N.'s grand plan to save forests hasn't worked, but some still believe it can*, Mongabay (July 14, 2020), https://news.mongabay.com/2020/07/u-n-s-grand-plan-to-save-forests-hasnt-worked-but-some-still-believe-it-can/ [https://perma.cc/CV6V-U73B].

143 Dominic Carver, *What were the outcomes of COP26?*, U.K. Parliament (Jan. 27, 2022), https://commonslibrary.parliament.uk/what-were-the-outcomes-of-cop26/ [https://perma.cc/Z95X-TXCY].

144 Fiona Harvey, *Ratchets, phase-downs and a fragile agreement: how Cop26 played out*, The Guardian (Nov. 15, 2021), https://www.theguardian.com/environment/2021/nov/15/ratchets-phase-downs-and-a-fragile-agreement-how-cop26-played-out [https://perma.cc/YR5Q-8TPB].

145 *See What Is Climate Loss and Damage?*, Union Concerned Scientists (Oct. 6, 2023), https://www.ucsusa.org/resources/what-climate-loss-and-damage [https://perma.cc/8FEQ-XMAG].

146 *See* Anna Åberg et al., *COP27: What was achieved, and what needs to happen now*, Chatham House (Nov. 20, 2022), https://www.chathamhouse.org/2022/11/cop27-what-was-achieved-and-what-needs-happen-now [https://perma.cc/XP4W-2VKC].

147 *See id.*

148 *See id.*

149 *Sultan al-Jaber: A quick guide to the COP28 president*, BBC (Dec. 1, 2023), https://www.bbc.com/news/science-environment-67591804?zephr-modal-register [https://perma.cc/78AE-BJZW].

Conference.[150] This brought back memories of pledges made by rich nations to developing countries at Copenhagen in 2009 for an annual $100 billion fund for carbon mitigation and climate adaptation that were never fully realized.[151] In 2021, the peak contribution year, the amount was under $90 billion.[152]

On the first day of the Conference in Dubai, delegates appeared to sense that an atmosphere of action was called for, and enacted an initial funding framework through the World Bank for the long-awaited Loss and Damage fund for developing nations.[153] The host nation and Germany immediately pledged $100 million each to the pot, with the United Kingdom kicking in $75 million.[154] France and Italy would later pledge $110 million apiece, while the U.S. pledged just $17.5 million.[155] The headline-grabbing event of the Conference was the section in the final agreement that the signatories would commence "transitioning away from fossil fuels" as energy sources, progressing to a net-zero carbon posture by 2050.[156] The language used here was a predictable compromise. Many environmentalists advocated more definitive words like "phaseout" to describe an exodus from carbon fuels, while most of the near-2500 fossil fuel lobbyists preferred terms that denote flexibility.[157]

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150 Anna Åberg, et al., *supra* note 146.

151 *See* David G. Victor, *COP28 and the ghosts of Copenhagen*, Brookings Inst. (Dec. 7, 2023), https://www.brookings.edu/articles/cop28-and-the-ghosts-of-copenhagen/ [https://perma.cc/49UF-M468].

152 *Climate Finance and the USD 100 billion goal,* UECD (2023), https://www.oecd.org/en/topics/sub-issues/climate-finance-and-the-usd-100-billion-goal.html [https://perma.cc/55BH-URBF] (actual funds have averaged just 80% of the pledge amount since the plan was launched).

153 *See* Fiona Harvey & Nina Lakhani, *Agreement on loss and damage deal reached on first day of Cop28 talks*, The Guardian (Nov. 30, 2023), https://www.theguardian.com/environment/2023/nov/30/agreement-on-loss-and-damage-deal-expected-on-first-day-of-cop28-talks#%3A~%3Atext%3DAgreement%20on%20loss%20and%20damage%20deal%20reached%20on%20first%20day%20of%20Cop28%20talks%2C-This%20article%20is%26text%3DA%20landmark%20deal%20to%20help%2Ca%20standing%20ovation%20from%20delegates [https://perma.cc/E7YT-NVVE].

154 *Id.*

155 U.S. donations to such international programs require Congressional approval. *See* Julia Haines, *What Countries Have Pledged to the 'Loss and Damage' Climate Change Fund,* U.S. News & World Rep. (Dec. 12, 2023), https://www.usnews.com/news/best-countries/articles/2023-12-12/country-pledges-to-the-loss-and-damage-climate-changefund#%3A~%3Atext%3DCountries%20contributing%20less%20to%20the%2Cand%20the%20Green%20Climate%20Fund [https://perma.cc/9CZU-USRN].

156 *See* Maxine Joselow & Vanessa Montalbano, *COP28 ended with a historic deal on fossil fuels. Here's what to know*, Wash. Post (Dec. 13, 2023), https://www.washingtonpost.com/politics/2023/12/13/cop28-ended-with-historic-deal-fossil-fuels-heres-what-know/?nid=top_pb_signin&arcId=H5B2XUX5BNFADAWX64R7BCZX2E&account_location=ONSITE_HEADER_ARTICLE [https://perma.cc/LT84-5ZE5].

157 *See* Brad Plumer & Max Bearak, *In a First, Nations at Climate Summit Agree to Move Away From Fossil Fuels*, N.Y. Times (Dec.13, 2023), https://www.nytimes.com/2023/12/13/climate/cop28-climate-agreement.html [https://perma.cc/YQ4S-2G5V].

In an unstated way, this describes the U.S. stance. While unprecedented investment is occurring in renewable energy and clean technology, U.S. oil production is at an all-time high.[158]

Related parts of the final accord feature a pledge—backed by 50 leading oil and gas companies worldwide—to reduce methane emissions through leaks to near zero by 2030.[159] This is the centerpiece of the Global Methane Pledge ("GMP"), which aims to reduce overall methane emissions by 30% by 2030.[160] While there is some level of confidence that in many developed nations with the requisite technologies available, inroads can be made in sealing the leakage problem in extraction, transport, and industrial processes, in other parts of the world, this is not a given. It is not clear that methane abatement has even been addressed in any significant fashion. To this point, such major oil and gas nations as Indonesia, Nigeria, and Iran have not produced any GHG inventory reports in over two decades.[161] In addition, any comprehensive strategy must articulate and integrate the other leading anthropogenic component to the methane equation—the role of agriculture. Although the initiation of the GMP is a necessary acknowledgement of the role methane can play in the overall climate strategy and outcome, given the multiplicity of sources and geographic spread of the problem, the jury will be receiving evidence for some time.

COP28 took another step forward when it created the Conference's first-ever Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action.[162] Specific missions were not articulated in the Declaration but there was acknowledgment that the issues must be treated as "food systems" with comprehensive strategies to be shaped,

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158 *See* David Blackmon, *The U.S. Domestic Oil Indus. Closes a Remarkably Strong 2023*, Forbes (Dec. 31, 2023), https://www.forbes.com/sites/davidblackmon/2023/12/31/the-us-domestic-oil-industry-closes-a-remarkably-strong-2023/?sh=79c520ca3213 [https://perma.cc/RG2E-M8EN] (as of December 2023 the U.S. is producing in excess of 13 million barrels of crude oil daily, which also leads all global nations).

159 Eklavya Gupte et al., *COP28: Fifty oil & gas co. sign net zero, methane pledges*, S&P Glob. (Dec. 2, 2023), https://www.spglobal.com/commodity-insights/en/news-research/latest-news/energy-transition/120223-cop28-fifty-oil-and-gas-companies-sign-net-zero-methane-pledges#%3A~%3Atext%3DOn%20methane%2C%20the%20agreement%20sees%2Cscrutinized%20using%20technology%20and%20data [https://perma.cc/JPQ2-TZ3L].

160 World Res. Inst., *STATEMENT: At COP28 Countries Announce New Efforts to Reduce Methane Pollution*, World Rsch. Inst. (Dec. 4, 2023), https://www.wri.org/news/statement-cop28-countries-announce-new-efforts-reduce-methane-pollution [https://perma.cc/5CDA-NBAD].

161 *The Global Methane Pledge,* Int'l. Energy Agency (2023), https://www.iea.org/reports/global-methane-tracker-2022/the-global-methane-pledge#abstract [https://perma.cc/8ZDH-SXNU].

162 COP28: UAE, COP28 UAE Declaration on Sustainable Agriculture, Resilient Food Systems & Climate Action (2023), https://www.tappcoalition.eu/images/COP28-UAE-Declaration-on-Sustainable-Agriculture-Resilient-Food-Systems-and-Climate-Action-1701436580.pdf [https://perma.cc/XRT4-RURD].

not only with regard to direct climate influences, but on broader issues of sustainability, economic justice and public health.[163] However, the lack of specific language addressing the significance of agricultural contributions to the GHG equation was a glaring omission, a likely sign of influence of a legion of lobbyists from the meat and dairy interests, who attended COP28 in numbers three times that of the previous year's Conference.[164]

One of the most conspicuous aspects of COP28 was the increased roles of what are known as "non-party stakeholders," which include sub-national governments, business leaders, cities, etc. in the discussion and consensus-building processes.[165] Participation rates by these players in negotiations were noticeably higher in most Conference sessions than in past years. None were as evident as the 50 oil and gas companies who helped accelerate group endorsement of the net-zero emissions and methane reduction pledges.[166] COP28 has the potential to be a turning point in the path of the cooperative climate abatement mission. The increased level of vigor of the proceedings at this Conference was palpable. Although there were no remarkable outcomes achieved there, the number and breadth of voices at the discussion table expanded measurably and contributed momentum to the proceedings. The lingering result of the 2023 meeting was: "There is still a chance."

Ultimately, the convergence of three elements working against each other have contributed to the ineffectiveness of three decades of international efforts to reduce GHG emissions. First are the policy approaches adopted by individual nations in these forums. Self-interest, often in the form of short-term political gain, has taken priority over longer-term collective welfare concerns.[167] This is especially true

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163 *See* Whitney Bauck, '*Food is finally on the table': COP28 addressed agric. in a real way*, The Guardian (Dec. 17, 2023), https://www.theguardian.com/environment/2023/dec/17/cop28-sustainable-agriculture-food-greenhouse-gases [https://perma.cc/BM86-52VH].

164 *Id.*

165 COP28: UAE, Summary of Global Climate Action at COP28 (2023), https://unfccc.int/sites/default/files/resource/Summary_GCA_COP28.pdf [https://perma.cc/MAV9-J3VH].

166 *See* John Benny, *Fifty oil & gas co. make pledges on methane and carbon dioxide at Cop28*, The Nat'l. (Dec 2, 2023), https://www.thenationalnews.com/climate/cop28/2023/12/02/fifty-oil-and-gas-companies-make-pledges-on-methane-and-carbon-dioxide-at-cop28/ [https://perma.cc/9P93-6AU5] ("If we want to accelerate progress across the climate agenda, we must bring everyone in to be accountable and responsible for climate action.").

167 Donald Trump, well in advance of his election and his subsequent actions that withdrew the U.S. from the Paris Climate Agreement, was decrying the "totalitarian tactics" of environmental protection policies. While campaigning for President in 2016, he promised to voters in the tightly contested states with fossil fuel industries that, under his leadership, "we're going to save that coal industry; believe me, we're going to save it." *See* Benjy Sarlin, *Donald Trump Pledges to Rip Up Paris Climate Agreement in Energy Speech*, NBC News (May 26, 2016), https://www.nbcnews.com/politics/2016-election/donald-trump-pledges-rip-paris-climate-agreement-energy-speech-n581236 [https://perma.cc/4KWC-H3MK].

when any material sacrifice by an individual nation is perceived to be an excessive price for achievement of collective quantitative and qualitative gains.[168] Most wealthy, economically "advanced" nations and those trying to elevate their stations produce huge quantities of consumer goods for global digestion; goods that are ultimately "use[d] up" for quick disposal.[169] However, the lasting end products are the massive and damaging releases of carbon compounds and other toxins into the planet's ecosystems.[170]

Second, despite the merits of collective discussion and agreement on the need to address human-caused climate change, the mechanisms for activating a string of international accords have proven entirely inadequate. From the initial framework agreement in Rio through successive pacts reached at Kyoto, Doha, Copenhagen, Paris, and most recently in Dubai, the key common element in all of these covenants is the "non-binding" nature of signatories' pledges.[171] The lack of teeth in the enforcement of these international agreements is an acknowledgment that conventions like the UNFCCC lack the leverage to influence powerful nations to take the definitive steps to meet the 1.5ºC maximum global temperature increase.[172] In turn, this invites major carbon

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168 Former Canadian Prime Minister Stephen Harper, whose national political strategy was based largely on his vision of Canada becoming an emerging energy superpower, was the prime mover in pulling his nation out of the Kyoto Protocol in 2011. Harper had disparaged the international agreement years earlier, having railed in a 2002 letter against the "job-killing, economy-destroying Kyoto accord." *See Harper's letter dismisses Kyoto as a 'socialist scheme'*, CBC News (Jan. 30, 2007, 8:47 PM), https://www.cbc.ca/news/canada/harper-s-letter-dismisses-kyoto-as-socialist-scheme-1.693166 [https://perma.cc/HGJ8-FNUG]; *see also* Miles Ryan Rowat, *Boom Times: Canada's Crude Petroleum Industry,* Statistics Can. (2006), https://www150.statcan.gc.ca/n1/en/pub/11-621-m/11-621-m2006047-eng.pdf?st=DnX7sMtD [https://perma.cc/KK5H-UQUS] (in the 2000's, international oil prices were on the rise, making Canada's vast oil sand deposits relatively more attractive for investment and development).

169 Consumer economies in the developed world produce more than twice the physical waste and refuse per capita than their counterparts in less-developed nations. The volume of global waste is expected to rise to well over two-billion tons in coming years. *See* The Editors, *Waste Woes in the World*, IMF Blog (Jan. 31, 2020), https://www.imf.org/en/Blogs/Articles/2020/01/31/waste-woes-in-the-world [https://perma.cc/C6AA-S8K5].

170 Oxford economist Kate Raworth calls this prevailing operating and development model "linear economics." *See generally* Kate Raworth, Doughnut Economics 175–178 (2017).

171 Although GHG reduction pledges are considered to be legally-binding by the Convention, the actual pledge reduction levels, known as "nationally determined contributions," are negotiated by individual countries, with no provisions in place to enforce compliance with these pledge reductions. *See* Andrea Januta, *As countries wrangle over climate pledges, how enforceable are they?*, Reuters (Nov. 13, 2021, 7:28 AM), https://www.reuters.com/business/cop/countries-wrangle-over-climate-pledges-how-enforceable-are-they-2021-11-12/ [https://perma.cc/P5N2-32KY].

172 China and the U.S. would have to reduce their aggregate GHG emission levels by 44 and 46 percent (respectively) from 2020 levels to meet targets in line with the 1.5-degree (Celsius) limit targets of the Paris Accord. *See* Harry Stevens & Brady Dennis, *National climate pledges are too*

emitters to water down their reduction commitments to levels just sufficient to claim they are doing something.[173]

Third, the time window for meaningful remedial action is becoming exceedingly tight. The process of forging consensus on carbon reduction action runs exceedingly slow. The Rio Earth Summit in 1992 required five years to shape its first GHG-reduction initiatives. The resulting 1997 Kyoto Protocol—because of a combination of activation rules and protracted ratification delays[174]—did not come into force until February 2005, over seven years after its framework was adopted by 140 countries.[175] Nearly five more years elapsed before the Copenhagen Accord induced GHG-leader China to sign its first reduction pledge in 2009.[176] Not until 2015 at the COP21 meeting in Paris did the Convention formally adopt GHG reduction target goals to cap a maximum global temperature increase of 2ºC by century's end.[177] The vote to establish a "Loss and Damage Fund" for developing nations hurt by climate change at Sharm El-Sheikh ("COP27") in 2022 was an idea first proposed on the international stage in 1991.[178] The most recent step forward—adoption of the "UAE Consensus" at COP28 in Dubai, which for the first time saw member nations articulate a measured commitment to transition away from fuels–came eight years after the Paris Agreement first called for such action.[179] Although it establishes a method for achieving the climate goals of the Paris Agreement, the combination of

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weak to avoid catastrophic warming. Most countries are on track to miss them anyway, Wash. Post (Oct. 29, 2021), https://www.washingtonpost.com/climate-environment/interactive/2021/climate-pledges-cop26/ .

173 *Id.* Even the pledged reduction totals from countries like the U.S. are some twenty-percent higher than the prescribed Paris target levels. Some countries (such as Brazil) actually pledge GHG levels 25% *higher* than their current discharges. *Id.*

174 The delay was the product of a conference rule that the Protocol could not become active unless its ratifying signatories represented 55% of GHG emitters. This threshold was not achieved until Russia ratified the agreement in 2004. *See Kyoto protocol comes into force*, The Guardian (Feb. 16, 2005), https://www.theguardian.com/science/2005/feb/16/sciencenews.environment [https://perma.cc/QA5W-UJMU].

175 *Id.*

176 *See* Elliot Diringer, *C2ES Statement on Copenhagen Accord*, Ctr. for Climate & Energy Sols. (Dec. 19, 2009), https://refresh-stg-c2es.pantheonsite.io/press-release/c2es-statement-on-copenhagen-accord/ [https://perma.cc/C9C5-7NVM].

177 *Key Aspects of the Paris Agreement*, U.N. Climate Change, https://unfccc.int/most-requested/key-aspects-of-the-paris-agreement [https://perma.cc/VG2X-KVU9].

178 *What Is Climate Loss and Damage?*, *supra* note 145.

179 Although the very mention of a phaseout of fossil fuels as primary energy sources was widely viewed as a victory of sorts, the final document is conspicuously devoid of language that lends guidance to establish the means to these ends. *See* John McGowan, *COP28 'UAE Consensus' Agreement Lacks Promised Action*, Forbes (Dec. 15, 2023), https://www.forbes.com/sites/jonmcgowan/2023/12/15/cop28-uae-consensus-agreement-lacks-promised-action/ [https://perma.cc/WXN9-KP22].

slow pace and numerous methodological and measurement problems fosters doubt about prospects for climate damage control.[180]

Formal diplomatic engagements focused on arresting the worst climatic effects of GHG emissions are now entering their fourth decade. The latest global estimates of GHG emissions registered a record of 53.8 billion metric tons (CO_2-eq) in 2022,[181] approximately 60% higher than 1990 levels,[182] which are the benchmark comparison levels for all subsequent GHG reduction initiatives put forth by the UNFCCC. Clearly, the strategies in play to this point have been abjectly inadequate and ineffective. A glimmer of hope exists in the recognition by a consortium of prominent commercial interests (as put forth at COP28) that successful economic activities can only be sustained in stable comprehensive environments.[183] Crisis conditions demand more aggressive policy approaches.

B. Most National Policy Approaches Are Ineffectual

Beginning with Finland in 1990, many countries have adopted some form of carbon tax,[184] often in combination with other environmental levies and tax subsidies.[185] Many of these same nations have also integrated these vehicles with the European Union's Emissions Trading System ("ETS").[186] Australia had a carbon tax for a time, but under

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180 There is considerable disagreement in the scientific community on the methods for measuring "global average temperatures," one of the two critical figures that guide policy directives. There are similar difficulties at arriving at a consensus on what constitutes a "net zero" level of carbon emissions into the atmosphere. *See* Fred Pearce, *Why the COP28 Climate Pact Likely Won't Cut It,* Mother Jones (Jan. 21, 2024) https://www.motherjones.com/politics/2024/01/cop28-un-climate-pact-problems-bad-science/ [https://perma.cc/PE2B-U4Y3].

181 *See* Ian Tiseo, *Global Greenhouse Gas Emissions 1970-2022* (Oct. 23, 2023) (data from IPCC).

182 *Id.*

183 *See* Andrew Winston, *Sustainable Business Went Mainstream in 2021*, Harv. Bus. Rev. (Dec. 27, 2021), https://hbr.org/2021/12/sustainable-business-went-mainstream-in-2021 [https://perma.cc/Q4CX-FBBY].

184 Alex Mengden, *Carbon Taxes in Europe, 2023*, Tax Found. Eur. (Sept. 5, 2023), https://taxfoundation.org/data/all/eu/carbon-taxes-in-europe-2023/#main [https://perma.cc/58Q2-HPE5].

185 *Where Carbon is Taxed (Overview)*, Carbon Tax Ctr. (2020), https://www.carbontax.org/where-carbon-is-taxed-%20overview/ [https://perma.cc/8PNG-4UGC]; *see also* Duff, *supra* note 7, at 2092, 2094 (noting the policy practices in Scandinavian countries that use such combination approaches, as well as other targeted levies, such as Sweden's fertilizer tax). *See Excise Duties on Good,* Bus. Den, https://businessindenmark.virk.dk/guidance/exicse-duties-on-goods/Environmental/#Sulphur [https://perma.cc/E7EV-DGN2] (Denmark also charges a tax based on a threshold level of sulfur in certain fuels and combustibles).

186 In addition to all EU member states, members of the European Free Trade Association (Iceland, Norway and Liechtenstein) also participate in the ETS. *See Scope of the EU ETS*, Eur. Comm'n (Dec. 21, 2023), https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/scope-eu-ets_en [https://perma.cc/2SJT-8SFP].

intense domestic political pressure, repealed it after only two years.[187] For most of the world, however, carbon goes untouched as a means to curb harmful emissions and as a revenue source for public treasuries.[188]

Taxes on methane—the fastest growing GHG threat today—are even rarer. Other than the U.S. methane fee passed in 2022,[189] no other country has adopted a dedicated tax on methane. However, New Zealand currently has plans to tax methane produced by its large cow and sheep population.[190] This nation has a human population of five million, a number dwarfed by the sheep at twenty-six million and cows at ten million herds that drive the country's robust dairy and meat export industry.[191] Almost half of New Zealand's GHG output is produced by agriculture, including 43% from methane.[192] Of this alarming proportion, some 85% is produced by livestock.[193] These significant methane discharges, as discussed earlier, are the products of a biological phenomenon known as "enteric fermentation."[194] The vast majority of methane produced by livestock occurs in their digestive tracts and is exhaled or expelled through manure.[195] The unique role that the livestock industry plays in the New Zealand economy has prompted the government to approach its GHG challenge through a "split-gas" approach, which levies short-lived gases (methane) on a different schedule than long-lived gases (carbon dioxide and nitrous oxide).[196] Final terms of the tax

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187 *Carbon tax: a timeline of its tortuous history in Australia*, Austl. Broad. Corp. News (July 9, 2014), https://www.abc.net.au/news/2014-07-10/carbon-tax-timeline/5569118 [https://perma.cc/5B9Y-EFRT].

188 Just 40 of the United Nations' 193 members utilize carbon pricing mechanisms, representing just 13-percent of global GHG emissions. *See* World Bank, State and Trends of Carbon Pricing, 2023, https://openknowledge.worldbank.org/entities/publication/58f2a409-9bb7-4ee6-899d-be47835c838f [https://perma.cc/5M93-TDQ2].

189 Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818.

190 *See* Ayen Bior & Ashley Brown, *New Zealand announces world-first plan to tax cow and sheep burps*, NPR (June 9, 2022), https://www.npr.org/2022/06/09/1104014587/new-zealand-announces-world-first-plan-to-tax-cow-and-sheep-burps [https://perma.cc/746Q-HMHX]; *see also* Fred Krupp & Antoine de Saint-Affrique, *There's Climate Solution In Dairy Cows' Stomachs*, Wall St. J. (Jan 17, 2023), https://www.wsj.com/articles/theres-a-climate-solution-in-dairy-cows-stomachs-emissions-greenhouse-gas-edf-agriculture-livestock-climate-change-11673883203 [https://perma.cc/9N6D-7HVV].

191 *See* Ellen Rykers, *How New Zealand is reducing methane emissions from farming*, BBC (Dec. 15, 2023), https://www.bbc.com/future/article/20231214-how-new-zealand-is-reducing-methane-emissions-from-farming [https://perma.cc/F3C6-R25B].

192 *Id*.

193 *Id*.

194 *Which is a bigger methane source: cow belching or cow flatulence?*, *supra* note 54.

195 *Id*.

196 *See* Jack Kennedy, *Understanding New Zealand's split gas approach to agricultural emissions*, Irish Farmers J. (Aug. 5, 2020), https://www.farmersjournal.ie/news/news/understanding-new-zealand-s-split-gas-approach-to-agricultural-emissions-558273 [https://perma.cc/3FEX-YEQT].

are still being set. The date for activation of the methane levy has been pushed back to the last quarter of 2025,[197] to give farmers more time to explore and establish methane mitigation techniques through technologies such as animal feeds that inhibit methane production[198] and carbon allowances through carbon sequestration.[199]

Many European countries have measures in place to control methane emissions. For instance, the European Union has mandatory leak detection rules and imposes a ban on venting and flaring in oil and gas industry operations.[200] No mandatory rules have been implemented in the agricultural area, but as part of the "Global Methane Pledge" initiated at COP26, research funds were authorized for enteric fermentation mitigation and other methane-lowering agricultural techniques.[201] None of these measures have squarely addressed curbing methane release at their core sources.

C. State & Local Policies Have Limited Reach

Regions, states, and especially cities[202] often feel the acute and specific effects of pollution and climate change. Given the shortcomings of global and national climate change initiatives, policymakers in these jurisdictions are increasingly forging their own plans to promote achievement of the climate goals set forth in the Kyoto[203] and Paris[204]

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197 *See* Tracy Withers, *New Zealand Pushes Start of Farm Emissions Tax to Late 2025,* Bloomberg (Aug. 17, 2023), https://www.bloomberg.com/news/articles/2023-08-18/new-zealand-pushes-start-of-farm-emissions-tax-to-late-2025 [https://perma.cc/DS5T-66VB].

198 Rykers, *supra* note 191.

199 Withers, *supra* note 197 ("carbon sequestration" is a strategy to fix carbon in the ground through selective establishment of perennial plants and soil enrichment techniques).

200 The European Parliament adopted new and more stringent reporting requirements on methane emissions, as well as on the methane content of imported sources of methane. *See Methane emissions*, Eur. Comm'n (Nov. 15, 2023), https://energy.ec.europa.eu/topics/carbon-management-and-fossil-fuels/methane-emissions_en [https://perma.cc/SY8A-FAS4].

201 *2023 Global Methane Pledge Ministerial: decisive action to curb emissions*, Eur. Comm'n (Dec. 4, 2023), https://energy.ec.europa.eu/news/2023-global-methane-pledge-ministerial-decisive-action-curb-emissions-2023-12-04_en [https://perma.cc/297K-WNUE].

202 Cities cover about 2% of the earth's surface but produce 60% of global GHG release and consume over three-quarters of global energy resources. *See Seven Ways Cities Can Take Climate Action*, U.N. Climate Change (Apr. 9, 2021), https://unfccc.int/news/seven-ways-cities-can-take-climate-action#%3A~%3Atext%3DCities%20only%20cover%202%25%20of%2Cthe%20way%20our%20cities%20function [https://perma.cc/3H8A-7HZ4].

203 Vicki Arroyo et al., *State Innovation on Climate Change: Reducing Emissions from Key Sectors While Preparing for a "New Normal"*, 10 Harv. L. & Pol'y Rev. 385, 386-388 (2016); Kirsten H. Engel & Barak Y. Orbach, *Micro-Motives and State and Local Climate Change Initiatives*, 2 Harv. L. & Pol'y Rev. 119, 122 (2008); *Developments—Climate Change*, 135 Harv. L. Rev. 1522, 1530 (2022).

204 Cinnamon P. Carlarne, *U.S. Climate Change Law: A Decade of Flux and an Uncertain Future*, 69 Am. U. L. Rev. 387, 423-24 (2019); Vicki Arroyo, *State and Local Climate Leadership in the Trumpocene*, 11 Carbon & Climate L. Rev. 303, 305-06 (2017).

global conventions. In the United States, as of August 2024, twenty states and the District of Columbia had created state-level contingency and policy adjustment regimes related to ongoing climate change phenomena, known as "climate adaptation implementation plans."[205] In addition, more than 1,000 municipalities throughout the United States[206] and more than 13,000 municipalities globally are engaged in some form of climate change policy activism.[207] Although localized initiatives are, by definition, limited in their impacts on aggregate behaviors, practices, and outcomes, they can play important roles by serving as active laboratories, open for observation and innovation in such diverse factors as comprehensive policy aims, technical policy execution, inter-governmental coordination, public education and information dissemination, and of grass-root citizen involvement.[208] In the following discussion, this Article discusses three policy initiatives that have produced results that are encouraging and thought-provoking, originating from the state, city, and regional levels, respectively.

1. State Level

One of the most peculiar features of the American public's attitudes about climate change is that while a strong majority of Americans believe that human-caused climate change is noticeable in their local communities, there is a sharp divide in opinion about whether the President and Congress should take aggressive action to slow its development.[209] Not surprisingly, the division falls largely upon partisan political lines. Residents of so-called "blue" states tend to favor strong policy action to combat global warming, while those from "red" states

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205 *See Climate Adaptation Action Plan*, Env't Prot. Agency, https://www.epa.gov/climate-adaptation/climate-adaptation-plans [https://perma.cc/R6B7-TD5S]; *see also State Adaptation Progress Tracker*, Geo. L., https://www.georgetownclimate.org/adaptation/plans.html [https://perma.cc/GY3T-J2NW].

206 The U.S. Conference of Mayors drafted the "Climate Protection Agreement," which pledges these municipalities to reduce carbon discharges to parameters in line with the Kyoto Protocol. *See Mayors Climate Protection Center*, U.S.Conf. Mayors, https://www.usmayors.org/programs/mayors-climate-protection-center/ [https://perma.cc/BJ46-N96K].

207 *See Home*, Glob. Covenant Mayors for Climate & Energy, https://www.globalcovenantofmayors.org/ [https://perma.cc/4N3L-XAXL].

208 Joshua A. Basseches et al., *Climate policy conflict in the U.S. states: a critical review and way forward*, 170 Climatic Change 1, https://pubmed.ncbi.nlm.nih.gov/35194272/ [https://perma.cc/9B2Z-9MXQ].

209 *See* Alec Tyson et al., *What the data says about americans' views of climate change*, Pew Rsch. Ctr. (Aug. 9, 2023), https://www.pewresearch.org/short-reads/2023/08/09/what-the-data-says-about-americans-views-of-climate-change/#%3A~%3Atext%3DNearly%20eight%2Din%2Dten%20Democrats%2Cidentical%20to%2010%20years%20ago [https://perma.cc/VW94-UT5T] (61% of those polled believed that climate change affected their home areas "a great deal or some").

generally disfavor government-led initiatives.[210] With no national consensus on the matter, it has fallen to states to enact their own climate policy measures. However, even in states hospitable to a degree of environmental regulation by the public sector, there is resistance. A recent court case in Oregon invalidated a state plan to reduce methane emissions by forcing natural gas utilities to adopt emission control standards in excess of their federal counterparts on technical grounds.[211]

Although no state has adopted any methane tax scheme, California has established a cap-and-trade system for carbon,[212] as well as a methane detection and capture apparatus (Landfill Methane Regulation).[213] The current California cap-and-trade program was implemented under legislation known variously as Assembly Bill 32 ("AB 32") or the Global Warming Solutions Act of 2006.[214] Under its provisions, the California Air Resources Board ("CARB"), a branch of the California Environmental Agency ("CALEPA"), is charged with its design and implementation.[215] The cap-and-trade regime covers 85% of California's GHG emissions, representing categories ranging from automobile efficiency and fuel composition to industrial activities, extractive processes, and waste containment.[216] It is said to cover the "broadest range

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210 *See* Peter Behr & E&E News, *Climate Concern Grows Nationwide, Even in Some Republican States*, Sci.Am. (Jan.24,2024),https://www.scientificamerican.com/article/climate-concern-grows-nationwide-even-in-some-republican-states/ [https://perma.cc/32RQ-H4QV].

211 Nw Nat Gas v. Env't Quality Comm'n, 542 P.3d 71 (Or. App., 2023) (The Court ruled for the natural gas companies, finding that the state environmental authorities violated their own disclosure rules in advance of imposition of the new regulations. The state regulators, in effect, have to procedurally "start over.").

212 Authorized under Assembly Bill 32, also known as the Global Warming Solutions Act of 2006 and administered by the California Air Resources Board ("CARB"). *See AB 32 Global Warming Solutions Act of 2006*, CA Air Res. Bd.(Sept.28,2018),https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006 [https://perma.cc/KUK2-R545].

213 *See infra* notes 229–30 and accompanying text. The Landfill Methane Regulation is another offshoot of Assembly Bill 32, which empowers CARB to implement its program to meet mandated methane reduction requirements. This is done through an ongoing construction of methane measurement networks and development of methane capture techniques, especially from high-emission sources such as landfills. *See Landfill Methane Regulation*, CA Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/landfill-methane-regulation/about [https://perma.cc/947H-WB4T].

214 *See AB 32 Global Warming Solutions Act of 2006*, CA Air Res. Bd. (Sept. 28, 2018), https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006 [https://perma.cc/KUK2-R545].

215 The breadth of the CARB's reach is substantial. Its review process provides valuable information for setting the next reference period's policy agenda, which extends for a five-year period via a "Scoping Plan." *Id.* A range of weighted policy scenarios are considered before one that best fits the comprehensive goals for the five-year climate mitigation policy period. *See 2022 Scoping Plan Documents*, CA Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents [https://perma.cc/R934-Q6KX].

216 *See* Alan Durning & Yoram Bauman, *17 Things to Know About California's Carbon Cap*, Sightline Inst. (May 22,2014),https://www.sightline.org/2014/05/22/17-things-to-know-about-californias-carbon-cap/ [https://perma.cc/V26Q-TXHB].

of industries of any such program in North America."[217] This includes "carbon by wire"—electricity imported into the state from GHG-producing generating plants that burn coal or natural gas.[218] Exemptions are granted to commercial exporters whose shipping destinations employ transportation modes beyond California's borders.[219] Similarly, carbon offsets, a sort of carbon credit, are given to certain activities in agriculture (like methane recovery from manure) or reforestation and other practices in resource renewal.[220]

The cap-and-trade system is straightforward and simply designed. It is imposed "upstream" at primary interface points of power-generation, base-stage industrial activities, shipping, and transport, and so forth. About 600 firms are subject to the carbon levies,[221] defined by meeting the threshold for mandatory inclusion by emitting at least 25,000 metric tons (CO_2-eq) of GHG discharge annually.[222] Participants are allowed to bank unused carbon permits for use in later periods; however, "borrowing" credits from future time frames is prohibited. Trading and permit inventory is tightly regulated, so gaming techniques such as permit hoarding are unlikely to occur.[223] CARB also regulates and verifies carbon offset activities, employing a team of certified inspectors in appropriate industries to document offset eligibility.[224] Firms can substitute offsets for reforestation and methane recapture from livestock manure and claim credits for 4% (through 2025; 6% through 2030) of their compliance obligation.[225] Commencing in 2021, no more than half of an entity's offset measure can be applied from projects that do not provide "direct benefits to the state."[226] Offset activities executed entirely within California are deemed to satisfy this standard.[227]

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217 Michael Hiltzik, *Emissions cap-and-trade program is working well in California*, L.A. Times (June 12, 2015), https://www.latimes.com/business/hiltzik/la-fi-hiltzik-20150613-column.html [https://perma.cc/ND84-3JQK].

218 Durning & Bauman, *supra* note 216.

219 *Id.*

220 *Id.* (An example of a carbon offset relating to agriculture is methane recovery from manure).

221 *Id.*

222 *See Climate Policy Fact Sheet: Cap-and-Trade*, U.C. Berkeley Ctr. L., Energy & Env't (2023), https://www.law.berkeley.edu/research/clee/research/climate/projectclimate/california-climate-policy-fact-sheets/ [https://perma.cc/DD29-HELU].

223 Durning & Bauman, *supra* note 216.

224 *See Offset Verification*, CA Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/compliance-offset-program/offset-verification [https://perma.cc/CZ9Z-JDLM].

225 *See Compliance Offset Program*, CA Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/compliance-offset-program/about [https://perma.cc/8M6Y-HR6R].

226 *Id.* This would include projects such as reforestation or riparian restoration projects that extended into neighboring states.

227 *Id.*

Allocation of permits was not grandfathered, but instead based on a combination of free allowances and an auction process. In the first two years of the program, from 2013 to 2014, CARB distributed about 90% of permits free of charge.[228] The free permits were given to leading electricity and natural gas utilities and large industrial concerns to help them absorb the initial internal costs associated with carbon abatement and improve their competitive positions relative to out-of-state players.[229] To boost incentivization, extra permits were given to companies with the greatest emission reduction.[230] When the cap expanded in 2015, most of the new permits—applied to petroleum-based fuels, liquid natural gas, and similar carbon-based products—entered the auction market under provisions of the Low Carbon Fuel Standards created under AB 32.[231] The cap-and-trade system does not allow waivers and exemptions, but does have price containment mechanisms. CARB has an Allowance Price Containment Reserve ("Reserve"), an uncirculated permit pool that can be added to the market at set prices in times of premium demand to hedge against excessive price acceleration.[232] There is also a provision for Price Ceiling Sales, which are offered in rare cases in which all permits in the Reserve are purchased and market entities that owe compliance obligations in the next deadline period have no available access to satisfy the obligation. These emergency permits are also sold at set prices above those in the Reserve pools.[233]

Another mandate of the California Global Warming Solutions Act[234] authorized the CARB with reducing methane as part of its comprehensive goals to reduce aggregate GHG levels, ultimately to 40% below 1990 levels by 2030.[235] CARB adopted the Landfill Methane Regulation ("LMR") in 2010 as a central component in this effort. Under LMR, operators of municipal solid waste landfills implement an integrated system for methane detection, measurement, reporting, and capture.[236] In tandem with landfill operators, another active member of this process is the California Department of Resources Recycling and

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228 Durning & Bauman, *supra* note 216.

229 *Id.*

230 *Id.*

231 *See* Sudeshna Mohanty & Marie McNamara, *Understanding California's Low Carbon Fuel Standards Regulation,* Rocky Mountain Inst. (Oct. 4, 2023), https://rmi.org/understanding-californias-low-carbon-fuel-standards-regulation/ [https://perma.cc/8UZS-GPD6].

232 *See Cost Containment Information*, CA Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/cost-containment-information [https://perma.cc/E5U3-LGHE].

233 *See Price Ceiling Information*, CA Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/cost-containment-information/price-ceiling-information [https://perma.cc/V53H-CQ5P].

234 *AB 32 Global Warming Solutions Act of 2006*, *supra* note 212.

235 *Id.*; Cal. Health & Safety Code § 38566 (West 2017).

236 *See Landfill Methane Regulation*, CA Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/landfill-methane-regulation/about [https://perma.cc/4H6G-A3TY].

Recovery ("CalRecycle"), another branch of CALEPA .[237] They have a threefold methane control methodology: (1) install new detection, measurement and capture equipment where none existed; (2) maximize methane capture efficiency through landfill design and operational adjustments; and (3) maximize methane recovery for use as a renewable energy resource.[238]

The big question for both residents of California and interested observers around the world about this policy experiment is: "Is it working?" The best short answer is a mixture of "Yes" and "Maybe." To be sure, in the first years of California's cap-and-trade scheme, impressive reductions were achieved in aggregate GHG emission levels statewide. In 2020, which was the first "target year" under the cap-and-trade regime, GHG emission reductions exceeded expectations, falling more than 16% below the 1990 levels set as the goal.[239] Compliance amongst covered businesses is extremely high, even sporting a 100% rate in 2001.[240] Another important factor is California's car efficiency standards, which result in the highest miles-per-gallon ratings in the U.S.—and by a wide margin.[241] Another important contributor to lower GHG emissions is the state's Low Carbon Fuel Standard, which encourages the production of lower carbon intensity fuels—principally for cars, trucks and jets—through a system of credit allowances and deficits.[242] Carbon

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237 *See* Ca. S.B. 63 (2009), http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb_0051-0100/sb_63_bill_20090728_chaptered.html [https://perma.cc/2M86-3RZN] (this bill eliminated the California Integrated Waste Management Board and transferred its jurisdiction over administering policy on waste management, resource conservation and recycling to a new branch of the California Environmental Protection Agency that became today's California Department of Resources Recycling and Recovery).

238 CalRecycle, *Analysis of the Progress Toward the SB 1383 Organic Waste Reduction Goals,* (Aug. 18, 2020), [https://perma.cc/G9V2-HGTL].

239 Total GHG emissions for 2020 measured at 369.2 million tons (carbon dioxide equivalent), well below the 1990 target level of 431 million tons (CO_2-eq). *See* Ca. Air Res. Bd., California Greenhouse Gas Emissions for 2000 to 2020: Trends of Emissions and Other Indicators (2022), https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf [https://perma.cc/BJT7-C4DT].

240 *See 100% of Companies in Cap-and-Trade Program Meet Compliance Obligations*, Ca. Air Res. Bd. (Nov. 3, 2021), https://ww2.arb.ca.gov/news/100-companies-cap-and-trade-program-meet-2020-compliance-obligations [https://perma.cc/AWM7-P8D9].

241 Stuart Kaplow, *EPA Moves to Overturn Calfornia's Motor Vehicle Emission Standards,* (Feb. 23, 2025), https://www.greenbuildinglawupdate.com/2025/02/articles/codes-and-regulations/epa-moves-to-overturn-californias-electric-vehicle-emission-standards/ [https://perma.cc/FXF2-GZJ5]. *See* Jonathan Lansner, *California cars are most fuel-efficient in US. Where are the gas guzzlers?*, Orange Cnty. Reg. (July 19, 2023), https://www.ocregister.com/2023/07/19/california-cars-are-most-fuel-efficient-in-us-where-are-the-gas-guzzlers/ [https://perma.cc/3EMG-3V6Z] (California cars tested an average of 31 miles-per-gallon, some 9%better than second-place Hawaii).

242 *See Low Carbon Fuel Standard*, Ca. Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about [https://perma.cc/FRU4-T5WK].

permit auctions have generated over $4 billion dollars the last two calendar years for the Greenhouse Gas Reduction Fund, the proceeds of which are directed to further carbon reduction technologies and practices, as well as to low-income and marginalized populations disproportionately affected by climate change and pollution.[243]

As GHG emission reduction targets move lower for 2030 and beyond, the successes of these early years of the state's cap-and-trade scheme will be more difficult to maintain. The principal obstacle to attaining these more ambitious goals is the dominant role of the transportation sector in GHG production. In 2023, emissions from automobile, truck, train and air traffic accounted for nearly 40% of the total.[244] Lagging electric vehicle supply, high relative cost[245] and underdeveloped charging station infrastructure[246] are likely to continue the dominance of internal combustion vehicles for the foreseeable future. On the optimistic side, continuing technological advances in industrial processes, the continued growth of wind and solar power, and improved waste management and carbon capture programs show continuing promise.

2. City Level

Climate change initiatives at the municipal level have tended to focus on GHG mitigation, but cities are also active in other aspects of environmentalism and sustainable practices.[247] International networks of local governments that promote these themes are plentiful, including

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243 *See Cap-and-Trade Program Data Dashboard*, Ca. Air Res. Bd., https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/program-data/cap-and-trade-program-data-dashboard#Figure8 [https://perma.cc/Y7YB-W2TG].

244 *See Current California GHG Emission Inventory Data*, Ca. Air Res. Bd., https://ww2.arb.ca.gov/ghg-inventory-data [https://perma.cc/S4LM-YDX6].

245 Even though new electric cars are becoming gradually more affordable relative to gasoline vehicles, they still average 15% more expensive. They are also more expensive to insure. *See* Andrew Lisa, *5 Hidden Costs of Electric Vehicles*, Yahoo Fin. (Oct. 21, 2023), https://finance.yahoo.com/news/5-hidden-costs-electric-vehicles-120044343.html?guccounter=1 [https://perma.cc/4MKZ-U4SZ].

246 Surveys of prospective car buyers showed that between one-third and one-half of those polled expressed hesitancy to purchase electric vehicles because of a shortage of charging stations both in their local areas and of the kind that fit their cars in more remote locations. *See* John Rosevear, *EV charging needs big improvements soon if the auto industry's transition is going to work*, CNBC (Sept. 19, 2023), https://www.cnbc.com/2023/09/19/ev-charging-industry-improvements.html [https://perma.cc/FGN2-KP9F].

247 *See* Katharine A. Trisolini, *All Hands-on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation.* 62 Stan. L. Rev. 669, 679 (2010) (cities often focus on environmental and conservation policies and practices that combat climate change indirectly, such as the installation of low-electricity street lamps, more efficient recycling regimes, and the like.); *see also,* Judd F. Sneirson & Nancy E. Shurtz, Sustainability & Business Law (2017) (setting forth an array of sustainable practices and an analysis of the laws that promote or impede them).

the ICLEI-Local Governments for Sustainability,[248] The Mayors Climate Protection Agreement,[249] and C40 Cities, a global consortium of large-city mayors focused on climate activism.[250] These organizations are not political in the sense of representing calcified or unified positions on specific policy prescriptions, but are beneficial facilitators for exchanges of ideas tying climate and sustainability themes to strategic policy, economics, science, and social welfare.[251]

In the U.S., San Francisco is recognized as an urban leader in enactment of environmental and sustainability policies. In 2008, the San Francisco Bay Area Air Quality Management District voted 15-1 to enact a business carbon tax.[252] It applied to over 2500 commercial concerns in the nine-county metropolitan zone, plus power plants and oil refining operations within its jurisdiction.[253] One of its unusual features was an exceptionally low rate of just 4.4 cents per ton of carbon dioxide. The vast majority of businesses, especially those not engaged in manufacturing or heavy industry, would pay as little as $1.00 per year under this scheme. The lion's share of the levy's burden fell on about a half-dozen large energy operations, each of which were projected to pay more than $50,000 a year, with one oil refinery slated to contribute as much as $195,000.[254] Even at this, revenues from the tax were projected to total just over $1 million.[255] The other unusual feature of this levy is that it was not intended to directly reduce GHG emissions by making polluters pay. Its primary purpose was to generate sufficient revenues to launch emissions monitoring of major GHG emitters and fund regional strategic planning efforts in anticipation of broader state initiatives to follow as authorized under the California Global Warming Solutions Act.[256]

As applied in the city of San Francisco, the carbon levy helped fund comprehensive environmental and conservation initiatives that

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248 *Home*, Loc. Gov't for Sustainability, https://iclei.org [https://perma.cc/8H46-4WE3] (this organization links over 2,500 city and regional jurisdictions with a focus on urban sustainability themes).

249 *Mayors Climate Protection Center*, *supra* note 206.

250 *Home*, C40 Cities, https://www.c40.org/ [https://perma.cc/C4C2-WAG6].

251 Duff, *supra* note 7.

252 *See* Jennifer Nastu, *S.F. Bay Area Passes Carbon Tax,* Env't + Energy Leader (May 22, 2008), https://www.environmentenergyleader.com/stories/sf-bay-area-passes-carbon-tax,33360 [https://perma.cc/2CEC-87EY].

253 *Id.*

254 *See* Felicity Barringer, *Businesses in Bay Area May Pay Fee for Emissions,* N.Y. Times (Apr. 17, 2008), https://www.nytimes.com/2008/04/17/us/17fee.html [https://perma.cc/3DT9-66Y6].

255 *Id.* The first year (to commence July 1, 2008) was slated to garner $1.1 million, 90% of which would be collected from power plants, a cement manufacturing operation, and the Shell oil refinery in Martinez, in the East Bay area.

256 *AB 32 Global Warming Solutions Act of 2006*, *supra* note 212.

were part of the city's Climate Action Plan.[257] These included expansion and reorganization of the waste recycling program, a ban on the use of plastic bags, and mandated adoption of LEED Silver ratings for all municipal buildings.[258] Successes were also witnessed on the GHG front. By 2020, San Francisco had reduced its total greenhouse gas emissions by 40% below 1990 levels.[259] This was despite a population increase of 12% and a GDP increase of 226%.[260]Aggregate efficiency gains in energy use, coupled with infrastructure improvements in the electrical generation and distribution networks, allowed the permanent closure of an antiquated, high-emission power plant in San Francisco. The shutdown of the Hunters Point oil-fired facility allowed the city to meet GHG emissions reductions called for by the Kyoto Protocol in 2008, four years earlier than the 2012 target date.[261]

This family of meaningful GHG reductions, in concert with other local environmental and conservation measures, is even more impressive in light of the fact that the resident population of San Francisco has increased substantially over the years.[262] The city and surrounding metropolitan areas' initiative to perform the necessary early steps to combat climate change in advance of large-scale state interventions show that measurable progress can be made without the imposition of significant or intrusive taxes and fees. Organizational and methodological improvements, coupled with thoughtful, integrated policy strategies on both stand-alone and cooperative bases illustrate that important roles exist for local players in the larger battle against the worst effects of climate change.

3. Regional Level

In addition to municipal and metropolitan climate initiatives, numerous regional and multi-state alliances exist. For example, in 2008, the Pacific Coast Collaborative ("PCC") was forged. This

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257 The San Francisco Board of Supervisor authorized the city's initial GHG reduction program through Resolution 158-02 in February 2002. It directed the Department of the Environment to coordinate a plan with appropriate adjunct agencies to formulate a strategy to reduce GHG emissions to 20% below 1990 levels by 2012. The first Climate Action Plan was issued in 2004. *See 2004 Climate Action Plan for San Francisco*, San Francisco Dep't. of Env't (Sept. 2004), https://www.sfenvironment.org/media/5089 [https://perma.cc/ET2H-FUV5].

258 *See San Francisco Climate Milestones*, San Francisco Dep't. of Env't, https://www.sfenvironment.org/climate-milestones [https://perma.cc/3G5S-KENF].

259 *Greenhouse Gas Emissions: San Francisco's annual greenhouse gas emissions*, SF.Gov, https://www.sf.gov/data--greenhouse-gas-emissions [https://perma.cc/D9PZ-J3YP].

260 *Id.*

261 See Kyoto Protocol, *supra* note 107 (the mandate for U.S. GHG reductions was 7% by 2012).

262 *San Francisco city, California*, U.S. Census Bureau, https://data.census.gov/profile/San_Francisco_city%2C_California?g=160XX00US0667000 [https://perma.cc/Y9P3-E82K].

intergovernmental agreement was signed by the governors of California, Oregon, Washington, Alaska, and the premier of British Columbia. In contrast to other environmentally oriented associations, the PCC is not a policy-implementation document. It is a statement of common purpose for promotion of such themes as clean energy development, low carbon transportation, green construction, conservation, and climate resilience.[263]

In 2009, four of the five PCC members signed a letter stating an intent to create a linked set of market-based carbon reduction policy regimes.[264] This pact was not binding, acknowledging the political reality that both Oregon and Washington failed in their attempts to establish unilateral cap-and-trade systems in the same year.[265] Participation in "soft" commitments as substitutes for "hard" action is a time-tested method for avoiding unpleasant political resistance.

Across the continent in the northeastern U.S. is a different kind of regional climate mitigation alliance. Established in 2005, the Regional Greenhouse Gas Initiative ("RGGI") is an eleven-state market-based association in the Mid-Atlantic and New England states.[266] Its purpose is to reduce emissions from fossil fuel electric power plants that possess a minimum 25-megawatt capacity.[267] The network does not address GHG emissions from commercial industrial operations, agriculture, or transportation, which limits its scope but simplifies its organization and functions. Through cooperative efforts by member states, a regional cap is established, defined along baseline measurements of carbon dioxide emissions.[268] Allowances represent units of GHG emissions and are sold through quarterly auction markets in the member states to the covered power plant operators. [269] Each year, the cap level is lowered after analysis of the system results. Proceeds from the auctions are

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263 *See generally Multi-State Initiatives*, Ctr. for Climate & Energy Sols., https://www.c2es.org/content/multi-state-initiatives/ [https://perma.cc/FX5L-9S32].

264 *See* Pacific Coast Action Plan on Climate and Energy, Pac. Coast Collaborative (Oct. 28, 2013), https://pacificcoastcollaborative.org/wp-content/uploads/2018/09/Pacific-Coast-Climate-Action-Plan.pdf [https://perma.cc/38HG-LWD7].

265 *See* SB 80 A, Or. State Legislature (2009), https://olis.oregonlegislature.gov/liz/2009R1/Measures/Overview/SB80 [https://perma.cc/2M7A-6V89]. *See also* HB 1819, Wash. State Legislature (2009), https://app.leg.wa.gov/billsummary?BillNumber=1819&Chamber=House&Year=2009 [https://perma.cc/S2E8-CX8V].

266 Member states are Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, Vermont, New York, New Jersey, Delaware, Maryland and Virginia. Pennsylvania has applied for membership. *See Elements of RGGI,* Reg'l Greenhouse Gas Initiative (2024), https://www.rggi.org/program-overview-and-design/elements [https://perma.cc/7H7Z-UPYK].

267 *Id.*

268 *See* Reg'l Greenhouse Gas Initiative, About the Regional Greenhouse Gas Initiative (2024), https://www.rggi.org/sites/default/files/Uploads/Fact%20Sheets/RGGI_101_Factsheet.pdf [https://perma.cc/JGR8-KDLV].

269 *Id.*

distributed through the states and dedicated to a combination of efficiency improvements to further lower GHG release and investments in clean economic development. These funds also support communities adversely affected by climate change, such as those impacted by floods, sea level rise, and the like.[270] RGG features banking of allowances, adjustable minimum and maximum auction price limits, and situational reserve allowances to add or subtract from the auction pool supply for further price stability.[271] RGGI conducts periodic program reviews to examine both system-wide issues such as the process for setting the appropriate cap level, and individual state plan adjustments subject to their unique situations. It is something of a balancing act to equalize the different characteristics and requirements of each member state and integrate these into the larger regional network to achieve optimal aggregate results and system stability.[272]

RGGI has been largely successful in its principal missions. Since its inception in 2005, carbon dioxide emissions in the system's covered plants have been reduced by nearly 50%.[273] As for the economic impact of its "cap-and-invest" model, a recent study revealed that in addition to the $3.8 billion distributed back into member states through allowance sales proceeds, the overall economic benefits to these states attained through efficiency gains, infrastructure improvements, and job creation exceeds $5.7 billion.[274] However, in the early years of this network, there were some operational hurdles to overcome. The principal substantive deficiency was that regional caps were set too high relative to the actual level of carbon dioxide discharges, resulting in low allowance auction prices and low incentives for power operators to reduce

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270 *Id. See also* Sarah Vogelsong, *Virginia reaps $228 million in first year of carbon market participation*, Va. Mercury (Dec. 6, 2021), https://virginiamercury.com/2021/12/06/virginia-reaps-228-million-in-first-year-of-carbon-market-participation/ [https://perma.cc/R62V-392U] (the state of Virginia, which joined RGGI in 2020, received some $227.6 million in auction distribution funds from the network in its first year, which was directed to flood-protection development and energy-efficient support for low-income consumers).

271 *See Implementing Section 111(D) of the Clean Air Act: The Pathway to Regional Cap-and-Trade Programs?*, No. 1 RMMLF-INST Paper No. 8, 8-7 (2015).

272 *See generally Multi-State Initiatives*, *supra* note 263.

273 *Regional Greenhouse Gas Initiative (RGGI)*, Ctr. for Climate Change & Energy Sols., https://www.c2es.org/content/regional-greenhouse-gas-initiative-rggi [https://perma.cc/L5NQ-4PMZ].

274 *See* Daniel Stuart & Paul Hibbard, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States,* Analysis Grp. (May 2023),https://www.analysisgroup.com/Insights/publishing/the-economic-impacts-of-the-regional-greenhouse-gas-initiative-on-ten-northeast-and-mid-atlantic-states2/ [https://perma.cc/2GQF-9BK7] (the $5.7 billion economic value included some 48,000 job-years).

emissions.[275] In 2013, RGGI conducted its First Program Review, in which it revamped its formula through changes to its Model Rule—the core operational document for each member state—and to its evaluative process in determining the regional cap.[276] The results were dramatic. Where one allowance equals one ton of carbon dioxide emission, the cap for 2012 was 165 million allowances; after the reforms, the 2014 cap was reduced to 91 million.[277] Auction allowance prices went up from a top of $1.93 per allowance in 2012 to a peak of $3.21 in 2014, as did auction revenues.[278] As cap levels have been adjusted downward over time, average allowance auction prices have increased commensurately due to increased scarcity and program design adjustments.[279] 2019 base prices reached $5.62 per ton of carbon dioxide, increasing to $7.41 in 2020, $13.90 in 2022, and a new high of $14.88 in December, 2023.[280] The aim of this simultaneous lowering of the cap ceilings coupled with known increases in the base price for marginal available allowances is to encourage further efficiency gains that can satisfy goals of 30% GHG reductions from 2020 levels by 2030.[281]

In addition to the systemic pressures applied by the convergence of supply, demand, and performance mandates, politics have also played a persistent role in RGGI's history. Early on, New Jersey Governor Chris Christie pulled his state out of RGGI in 2011, calling the cap-and-invest regime a "failure" that "does nothing more than tax electricity…with no discernible or measurable impact upon our environment."[282] Christie's unilateral decision occurred before RGGI's adjustments to its processes of cap and allowance parameters, which

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275 *See* Mark Febrizio, *RGGI: A Faulty Model for "Successful" Cap-and-Trade,* Inst. For Energy Rsch. (Dec. 15, 2015), https://www.instituteforenergyresearch.org/regulation/rggi-a-faulty-model-for-successful-cap-and-trade/ [https://perma.cc/85WE-J9NF].

276 *Regional Greenhouse Gas Initiative (RGGI)*, *supra* note 273.

277 *Elements of RGGI*, *supra* note 266.

278 *See Regional Greenhouse Gas Initiative (RGGI)*, *supra* note 273.

279 The December 2021 auction issued 23.1 million allowances, which sold out quickly. This triggered the availability of an additional 3.9 million allowances (part of the Cost Containment Reserve or CCR) at the predetermined price of $13 to maintain price stability. Under provisions of RGGI's program review process, the "trigger price" of this reserve increases by 7% a year. Accordingly, the trigger price for 2022 was set at $13.90 per CCR allowance. *See CO2 Emissions Allowance Prices Increased in Latest RGGI Auction,* U.S. Energy Info. Admin. (Jan. 24, 2022), https://www.eia.gov/todayinenergy/detail.php?id=50998 [https://perma.cc/WK6J-UC76].

280 *See Allowance Prices and Volumes*, Reg'l Greenhouse Gas Initiative, https://www.rggi.org/auctions/auction-results/prices-volumes [https://perma.cc/7QFF-ZF67].

281 *Regional Greenhouse Gas Initiative (RGGI)*, *supra* note 273.

282 *New Jersey to pull out of carbon cap group*, United Press Int'l (May 27, 2011), https://www.upi.com/Top_News/US/2011/05/27/New-Jersey-to-pull-out-of-carbon-cap-group/UPI-11761306530594/ [https://perma.cc/JWC3-EB5W].

showed discernible results.[283] New Jersey rejoined RGGI in 2020.[284] Virginia Governor Glenn Youngkin is attempting to pull his state from RGGI membership, claiming that its emissions reduction mandates constitute a "regressive tax which does not do anything to incentivize the reduction of emissions in Virginia."[285] Youngkin's authority to unilaterally terminate Virginia's participation in RGGI is being challenged in the courts, with no definitive outcome to date.[286] In addition, Pennsylvania's Commonwealth Court recently blocked the state's pending membership in RGGI, ruling that revenue generated and distributed through the regional network "constitutes a tax…in violation of the Pennsylvania Constitution."[287] Pennsylvania Governor Josh Shapiro, a strong backer of RGGI membership, has appealed the adverse ruling to the state's Supreme Court.[288]

While the push-and-pull of politics is a predictable element in large multi-state ventures such as RGGI, evaluation based on performance parameters has generally been positive. The relative simplicity of the program's design has resulted in lower aggregate carbon emissions. RGGI's focus on carbon dioxide limits its scope of effectiveness, but because fossil fuel power plants emit several types of GHG gases, there has been a beneficial piggyback effect of reductions of other categories of harmful emissions, such as sulfur dioxide and nitrous oxide.[289] However, this very simplicity of the system structure reveals RGGI's limitations. Sources of GHGs not directly tied to fossil fuel

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283 *See Regional Greenhouse Gas Initiative (RGGI)*, *supra* note 273.

284 *See New Jersey Participation*, Reg'l Greenhouse Gas Initiative (2024), https://www.rggi.org/program-overview-and-design/design-archive/nj-participation [https://perma.cc/38AV-KK34].

285 *See* Gregory S. Schneider, *Va. environmentalists sue to block Youngkin from exiting carbon market*, Wash. Post (Aug. 22, 2023), https://www.washingtonpost.com/dc-md-va/2023/08/21/youngkin-virginia-rggi-environmental-suit/ [https://perma.cc/6D3G-TEVM].

286 A Virginia circuit court judge rejected petitioners claims that Gov. Youngkin exceeded his authority in seeking to terminate the state's participation in RGGI, but did so chiefly on technical and procedural grounds, opening the door for legal challenges in other Virginia jurisdictions. *See* Jeremy Cox, *Judge deals blow to legal effort to halt Virginia's RGGI withdrawal,* Bay J. (Nov. 13, 2023), https://www.bayjournal.com/news/climate_change/judge-deals-blow-to-legal-effort-to-halt-virginia-s-rggi-withdrawal/article_393b1824-8278-11ee-bfe9-23632ee94945.html [https://perma.cc/5XY3-SDSJ].

287 The lawsuit in question was brought by a consortium of coal and natural gas business concerns. *See UPDATE: Pennsylvania Court rules against RGGI link; government appeals*, Int'l. Carbon Action P'ship (Dec. 18, 2023), https://icapcarbonaction.com/en/news/update-pennsylvania-court-rules-against-rggi-link-government-appeals [https://perma.cc/JWV6-2TZK].

288 *Id.*

289 This was a significant factor in the decision of the government of Pennsylvania to seek membership in RGGI. *See Climate Change,* Pa. Dep't. of Env't Prot. (2024), https://www.pa.gov/agencies/dep/residents/climate-change.html [https://perma.cc/N4R3-MDRQ].

power plants–such as natural gas leakage–are not covered,[290] and GHG pollution remains concentrated near those plants, often disproportionately affecting communities of color and lower-income populations.[291]

D. U.S. Federal Climate Change Policies Have Largely Failed

The U.S. federal government's inconsistent climate change policies have been largely ineffective at reducing the GHG emissions that drive the global warming train. The constantly shifting orientation of Congress[292] and increasing polarization in the legislative ranks resulted in a legislative void punctuated by unsuccessful Congressional legislative proposals on a carbon cap-and-trade system[293] and carbon tax.[294] Consequently, active federal policies have been implemented chiefly through application of EPA rules, regulations, and presidential executive orders.[295] In many instances, directives from the executive branch actively seek to reverse policies set in place from the previous

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290 *See* Peter Della-Rocca, *The Regional Greenhouse Gas Initiative is at a critical juncture. Here are 3 ways it can put states on the path to meet our climate goals,* Env't Def. Fund (Nov. 20, 2023), https://blogs.edf.org/climate411/2023/11/20/the-regional-greenhouse-gas-initiative-is-at-a-critical-juncture-here-are-3-ways-it-can-put-states-on-the-path-to-meet-our-climate-goals/ [https://perma.cc/9U2A-FQT8].

291 *See* Juan Declet-Berreto & Andrew A. Rosenberg, *Environmental justice and power plant emissions in the Regional Greenhouse Gas Initiative states,* PLOS One (July 20, 2022), https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0271026 [https://perma.cc/6KSP-GP8A].

292 Since 2001, there have only been four Congresses with single-party majorities in both the House of Representatives and the Senate, with a same-party President in the White House. These were Republican majorities from 2003-2007 under the George W. Bush Administration, Democratic majorities from 2009-2011 under President Barack Obama, and Republican majorities from 2017-2019 under the Donald Trump presidency. *See Party Division*, U.S. Senate Hist. Off., https://www.senate.gov/history/partydiv.htm [https://perma.cc/HXE6-PYLF].

293 Bipartisan Senate legislation was introduced by Senators John McCain (R-Arizona) and Joe Lieberman (D-Connecticut) in both 2005 and 2007 that would have established the first cap-and-trade system at the federal level specifically aimed at reducing GHG emissions in light of U.S. (non-binding) recognition of global calls for measurable reductions in climate-altering carbon compounds in the atmosphere. Both measures failed resoundingly. *See* Amber Phillips, *Congress's long history of doing nothing on climate change, in 6 Acts*, Wash. Post (Dec. 1, 2015), https://www.washingtonpost.com/news/the-fix/wp/2015/12/01/congresss-long-history-of-inaction-on-climate-change-in-6-parts/ [https://perma.cc/V8BE-P4ZY].

294 President Bill Clinton backed a "BTU tax" in 1993 that would have imposed an average 13.8-cent tax per gallon on gasoline, diesel and certain specialty petroleum fuels based on their heat content. The measure passed in the House but failed in the Senate. *See Some History*, Carbon Tax Ctr., https://www.carbontax.org/some-history/ [https://perma.cc/7XXG-LB53].

295 *Laws and Executive Orders,* Env't Prot. Agency, https://www.epa.gov/laws-regulations/laws-and-executive-orders. President Obama*'s 2015* Clean Power Plan was an example of such an executive action. It called on states to submit plans in accord with EPA guidelines to achieve a national reduction of GHG emissions from power plants by 32% from 2005 levels by 2030. *See What is the Clean Power Plan,* Nat. Res. Def. Council (Sept. 29, 2017), https://www.nrdc.org/stories/what-clean-power-plan [https://perma.cc/YH6U-XDMB].

Administration.[296] In the vacuum created by Congressional apathy on environmental policy matters, the character of federal administrative approaches to the climate crisis depends almost entirely on the disposition of the current occupant of the White House.[297]

However, the reins are being tightened on executive authority in exercising its legislative mandate to execute and enforce environmental law. In 2022, the U.S. Supreme Court ruled in *West Virginia vs. EPA*[298] that the EPA was limited in its ability to enforce provisions under the Clean Air Act that included requirements that certain power plant operators shift their modes of electrical generation away from fossil fuels to renewable sources such as wind or solar.[299] This decision has been widely viewed as another instance of politics encroaching increasingly in the interpretation and application of standing law, with dramatic potential to fundamentally alter how legislation and policies are formulated and implemented.[300]

1. The Flip-Flop Political Game[301]

In the aftermath of the 2008 general election, President-Elect Obama suggested the use of a cap-and-trade GHG-reduction regime

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296 President Trump issued an executive order in 2019 that effectively scrapped the Obama Administration's Clean Power Plan announced in 2015. In its place was placed a Trump directive called the Affordable Clean Energy Rule, which emphasized emissions reductions through efficiency gains, but encouraged continued reliance on coal-fired electric power. *See* Rob Jordan, *Goodbye, Clean Power Plan: Stanford researchers discuss the new energy rule,* Stan. News Serv. (June 21, 2019), https://news.stanford.edu/stories/2019/06/goodbye-clean-power-plan-understanding-new-energy-rule [https://perma.cc/4RD9-GPHM].

297 *See* Robin Kundis Craig, *Climate adaptation law and policy in the United States,* 9 Ocean Sol. (2022), https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2022.1059734/full [https://perma.cc/JF3J-VKY7].

298 West Virginia v. EPA, 597 U.S. 697 (2022).

299 *Id.* In the 6-3 decision, the majority invoked what has come to be called the "major questions doctrine," the view that in matters pertaining to agency execution of mandated congressional legislation, the EPA was not expressly authorized by Congress to prescribe alternate power-generating methods for operators in order to meet aggregate emissions reduction goals.

300 *See* Alice C. Hill, *What Does the Supreme Court's Decision in West Virginia v. EPA Mean for U.S. Action on Climate,* Council on Foreign Rel. (July 19, 2022), https://www.cfr.org/blog/what-does-supreme-courts-decision-west-virginia-v-epa-mean-us-action-climate [https://perma.cc/ND9Q-AXV7].

301 Steven Ferrey, *Disordered Law: Obama to Trump Executive Branch Orders Mandating Non-Enforcement of International Treaties*, 85 Alb. L. Rev. 439-500 (2021-2022) (Professor Ferrey points to numerous precedents in law to which both Democratic and Republican federal administrations skirted enforcement mandates to attain preferred political results in the environmental law arena. Perhaps most prominent amongst these were the disparate treatments of the Obama and Trump Administrations given to one of the oldest international treaties involving species preservation, the Migratory Bird Treaty Act (1918), codified as 16 U.S.C. §703. The Obama Administration sought a "partial" reprieve (through plea agreements) from enforcement responsibilities of the Act in favor of operators of Administration-preferred wind-turbine electrical generators that

to attain 80% domestic cuts by 2050 and make the U.S. a global leader in the fight against climate change.[302] Obama's scheme called for a federal apparatus that imposed a mandatory cap on omissions with flexible compliance provisions.[303] The regime sought to promote early action, innovation, and technological efficiency without stunting economic growth.[304] In his first year in office, Obama issued an executive order[305] requiring federal agencies to adopt measures within their operations to reduce GHG emissions within parameters designed in conjunction with the interagency Climate Change Adaptation Task Force.[306] Obama took further steps, initiating his Climate Action Plan in June 2013, which charged a broad swath of federal agencies to design new rules, regulations, and programs to achieve these carbon reduction goals.[307] Setting the tone for this sweeping program within the executive branch was the EPA's issuance of its New Source Performance Standards ("NSPS") in 2012,[308] which targeted reductions of methane and Volatile Organic Compounds[309] in oil and gas operations. A second set of NSPS directives

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were accused of killing several hundred migratory birds in their operation. The succeeding Trump Administration took another tack, choosing to ignore enforcement of the treaty altogether via an executive order (No. 13,783) that exempted previous obligations that "unduly burden the development of domestic energy resources beyond the degree necessary to protect the public interest or otherwise comply with the law." Evidently, migratory birds (including the national bird, the bald eagle) were not considered resources that resided within the boundaries of "the public interest." *Id.* at 445-48).

302 Robert N. Stavins, *Obama's Speech on a U.S. Cap-and-Trade System and Global Climate Negotiations*, Harv. Belfer Ctr. (Nov. 20, 2008), https://www.belfercenter.org/publication/obamas-speech-us-cap-and-trade-system-and-global-climate-negotiations [https://perma.cc/QZ6B-8PU4].

303 Chad Stone et al., *Cap and Trade Can Fight Global Warming Effectively While Also Protecting Consumers*, Ctr. on Budget & Pol'y Priorities (Mar. 3, 2009), https://www.cbpp.org/research/cap-and-trade-can-fight-global-warming-effectively-while-also-protecting-consumers [https://perma.cc/3NTF-EV54].

304 Nat'l Econ. Coucil & Off. of Sci. & Tech. Pol'y, A Strategy for American Innovation (Oct. 2015), https://obamawhitehouse.archives.gov/sites/default/files/strategy_for_american_innovation_october_2015.pdf [https://perma.cc/59CR-BK5P].

305 Exec. Order No. 13,514, 74 Fed. Reg. 52117 (Oct. 5, 2009) (revoked by Exec. Order No. 13,693, 80 Fed. Reg. 15871 (Mar. 19, 2015) (pursuant to the Executive Order, all federal agencies were required to issue climate change adaptation policy statements by June 2010, which plotted agency-wide strategies to address climate-related challenges within their respective programs and realms of operations).

306 *Id.*

307 *FACT SHEET: President Obama's Climate Action Plan*, White House (June 25, 2013), https://obamawhitehouse.archives.gov/the-press-office/2013/06/25/fact-sheet-president-obama-s-climate-action-plan [https://perma.cc/LDH5-H8E9].

308 Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 77 Fed. Reg. 49489 (Aug. 16, 2012).

309 VOCs are organic compounds that evaporate into the atmosphere as part of the extraction, production and storage of oil and natural gas operations, as well as other industrial processes. In addition to methane, some of these gases include benzene, toluene and xylene, all known to produce adverse health effects in humans. *See* Kasturi Laturkar & Kaustubh Lakurkar,

were issued in 2016.[310] Another rule, this one initiated by the Bureau of Land Management ("BLM") in 2016, targeted reductions of methane emissions through venting, flaring, and leaks from onshore oil and gas operations on federal lands[311] and Indian lease sites.[312]

The Obama Administration focused its efforts on the EPA's approach of treating GHGs as air pollution under the Clean Air Act.[313] The EPA set forth clean energy guidelines under the President's Clean Power Plan ("CPP"),[314] which applied to existing fuel-fired electric plants.[315] Under the plan, states were required to submit an implantation strategy for EPA review by mid-2016 and were authorized to develop market-based programs to meet emission targets.[316] New methane rules were also set in place that required oil and gas firms to limit emissions, eliminate leaks, and upgrade emissions monitoring.[317] Legal challenges to the new rules came fast and were numerous.[318] In an action taken up in the Court of Appeals for the District of Columbia in 2016, the state of North Dakota argued that the new EPA rules were "arbitrary, capricious, an abuse of discretion and not in accordance with law."[319]

Volatile organic carbon emissions in oil and gas industry: Impact and Mitigation, World Oil (Nov. 2023), https://worldoil.com/magazine/2023/november-2023/special-focus-advances-in-production/volatile-organic-carbon-emissions-in-oil-and-gas-industry-impact-and-mitigation/ [https://perma.cc/TF5F-37SD].

310 Oil and Natural Gas Sector: Emissions Standards for New and Modified Sources, 81 Fed. Reg. 35,824 (June 3, 2016).

311 *See* Waste Prevention, Production Subject to Royalties and Resources Conservation, 81 Fed. Reg. 83,008 (Nov. 18, 2016).

312 Exemptions from these rules exist for the Osage tribe in Oklahoma, which is administered separately by the Bureau of Indian Affairs (BIA) through its lease agreement, which dates to 1906. A new rule regime is in the final stages of preparation, involving input from the BLM, BIA and the tribes. Part of the comprehensive plan involves mitigation of methane leaks from orphaned oil wells operated by the Osage Nation. *See Osage Oil and Gas Environmental Impact Statement,* Bureau Indian Affs. (Dec. 2020), https://www.bia.gov/regional-offices/eastern-oklahoma/osage-agency/osage-oil-and-gas-eis [https://perma.cc/PT9U-8Z6B].

313 Clean Air Act of 1963, 42 U.S.C. § 7401(d) (2014).

314 *See Laws and Executive Orders*, *supra* note 295.

315 *Clean Power Plan for Existing Power Plants: Regulatory Actions*, Env't Prot. Agency, https://archive.epa.gov/epa/cleanpowerplan/clean-power-plan-existing-power-plants-regulatory-actions.html [https://perma.cc/DE57-ESYV].

316 *See* Craig Gannett, *Implementing Section 111(D) of the Clean Air Act: The Pathway to Regional Cap-and-Trade Programs?*, Rocky Mountain Min. L. Found. 8-3 (Jan. 2015) (noting the allowance of "market-based trading programs").

317 The new EPA rules sought to reduce methane emissions by 40% below 2012 levels by 2025. *See* Amanda Reilly, *14 states, trade groups challenge EPA methane rule*, E&E News (Aug. 2, 2016), https://subscriber.politicopro.com/article/eenews/2016/08/02/14-states-trade-groups-challenge-epa-methane-rule-072338 [https://perma.cc/UWU6-CPJS].

318 *Id.*

319 *Id.* (the Texas Attorney General characterized the new regulations as a "gross demonstration of federal overreach").

In the intervening years, the issue as to whether the CPP even falls within the EPA's sphere of authority has been litigated. This issue came to a head in the landmark Supreme Court *West Virginia*[320] decision, which effectively strips EPA's ability to implement certain types of GHG control directives without specific congressional authorization.[321]

When Donald Trump assumed the presidency in January 2017, his administrative policy on environmental issues was to countermand most of President Obama's initiatives.[322] Shortly after taking office, Trump issued Executive Order 13783,[323] his initiative for "Promoting Energy Independence and Economic Growth.[324] The Order sought to neutralize, if not reverse, EPA and BLM "regulatory burdens that unnecessarily encumber energy production, constrain economic growth, and prevent job creation."[325] A few months later, Trump announced the withdrawal of the U.S. from the 2015 Paris Agreement, citing that its call for America to reduce its GHG emissions "disadvantages the United States to the exclusive benefit of other countries."[326] In response to the string of Trump directives that weakened a host of environmental policy safeguards and their enforcement, California and 19 other states sued the Administration, specifically claiming that Trump's peel back of methane emissions rules constituted a public health crisis.[327]

The policy flip continued when Joe Biden was inaugurated as U.S. President on January 20, 2021.[328] On his first day in office, Biden reinstated the nation's endorsement of and participation in the Paris Agreement.[329] He followed this action with the issuance of two related executive orders, the first of these on the same day as the announcement

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320 597 U.S. 697 (2022).

321 Hill, *supra* note 300. *See also* Shay Dvoretzky et al., *West Virginia v. EPA: Implications for Climate Change and Beyond*, Skadden (Sept. 2022), https://www.skadden.com/insights/publications/2022/09/quarterly-insights/west-virginia-v-epa [https://perma.cc/NHT2-J8ED].

322 Craig, *supra* note 297.

323 Exec. Order 13,783, 82 Fed. Reg. 16093 (Mar. 28, 2017).

324 *Id.*

325 *Id.*

326 President Trump also decried temporary exemptions on emissions reductions for China and India, adding that he was "elected to represent Pittsburgh, not Paris." *See Statement of President Trump on the Paris Climate Accord,* White House (June 1, 2017), https://trumpwhitehouse.archives.gov/briefings-statements/statement-president-trump-paris-climate-accord/ [https://perma.cc/BK4Y-WAWJ].

327 California Attorney General Xavier Becerra stated in announcing the suit: "Our climate emergency is increasingly a public health emergency…increasingly measured in human life." *See* Richard Valdmanis, *California, 19 other states sue Trump administration for weakening methane rules*, Reuters (Sept. 14, 2020), https://www.reuters.com/article/us-usa-climatechange-lawsuit-idUSKBN2652EB/ [https://perma.cc/F3K2-L98Y].

328 Craig, *supra* note 297.

329 *Paris Climate Agreement,* White House (Jan. 20, 2021), https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2021/01/20/paris-climate-agreement/ [https://perma.cc/W2PC-Q275].

of the reengagement in the Paris Accord. This was Executive Order 13990,[330] called "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis."[331] Setting forth an agenda "to improve public health and protect our environment," the Order directed "all executive departments and agencies" to essentially repurpose Trump-era departmental policies "that conflict with these important national objectives" and set forth to "immediately commence work to confront the climate crisis."[332] Less than a week later, Biden issued Executive Order 14008, titled "Tackling the Climate Crisis at Home and Abroad."[333] This proclamation takes the form of a "mission statement," committing the Biden Administration to a set of policy priorities that integrates pursuit of climate mitigation efforts in cooperative foreign affairs initiatives, national defense strategies, economic development, and public health enhancements.[334]

The Biden Administration has used this foundation to issue a series of subsequent climate-related executive initiatives. In November 2021, the EPA announced its intention to establish new rules targeting sharp reductions of methane emissions in the oil and gas industry, as well as identifying other sources of this potent GHG.[335] The agency did not unveil its methane strategy for another year, in part because the U.S. Supreme Court's ruling in *West Virginia v. EPA*[336] limited the reach of its authority to compel operators of "dirty"—principally coal—power-generating plants to shift to cleaner modes of electricity production.[337] The modified methane control strategy, announced in November 2022, emphasized updated standards for existing sources of methane emissions, identification and containment of alternate sources of methane, and renewed emphasis on pursuing air and particulate

330 Exec. Order 13,990, 86 Fed. Reg. 7037 (Jan. 20, 2021).

331 *Id.*

332 The Executive Order also highlights four target areas for action: 1) Methane emissions reduction in the gas industry sector; 2) Establishing new and ambitious vehicle fuel-efficiency standards; 3) Boosting energy-efficient appliance design and production, as well as in commercial and residential building construction; and 4) Revamping air quality standards under the Clean Air Act and improving transparency in the policymaking process. *Id.*

333 Exec. Order 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

334 *Id. See also* Craig, *supra* note 297, who points out: "Federal agencies have continued to implement these and other climate-related executive orders."

335 *U.S. to Sharply Cut Methane Pollution that Threatens the Climate and Public Health,* Env't Prot. Agency (Nov. 2, 2021), https://www.epa.gov/newsreleases/us-sharply-cut-methane-pollution-threatens-climate-and-public-health [https://perma.cc/C4FC-3TVL].

336 597 U.S. 697 (2022).

337 *Id.*

pollutant reductions, which generally involve coincidental changes in GHG discharges.[338]

The Supreme Court decision in *West Virginia,* taken in concert with other recent decisions, such as *Biden v. Nebraska,*[339] illustrate a trend of a decided narrowing of administrative authority within executive branch agencies to implement large-scale public policy initiatives.[340] This has serious implications for the future of significant policy prescriptions to meet the formidable realities of the climate crisis. However, policy avenues continue to appear. In the methane area, Congress managed to follow one of these new paths with provisions contained in the Inflation Reduction Act of 2022.[341]

2. Ramifications of West Virginia v. EPA

One of the vagaries of the U.S. Supreme Court ruling of *West Virginia v. EPA*[342] is that the alleged overreach of EPA on GHG emissions of coal-fired power plants was tied to a policy regime—the CPP—that was never implemented.[343] Indeed, the first preliminary challenges by a consortium of states and power companies were filed with the D.C. Circuit Court of Appeals *before* the EPA's final rules for the CPP were formally presented.[344] After over a year of legal wrangling, the Supreme

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338 Long-term models suggest that even if human-caused GHG emissions remain steady, climate change will still increase aggregate pollution and small particulate matter concentration in the atmosphere, with corresponding negative effects on human health and degraded ecosystems, thus magnifying the need for dramatic reductions in both GHG and other pollutants. *See* Yangyang Xu & Jean-Francois Lamarque, *Isolating the Meteorological Impact of 21st Century GHG Warming on the Removal and Atmospheric Loading of Anthropogenic Fine Particulate Matter Pollution at Global Scale,* 6 Earth's Future 428, 437 (Mar. 2018), https://agupubs.onlinelibrary.wiley.com/doi/10.1002/2017EF000684 [https://perma.cc/XL5G-NG7Z].

339 600 U.S. 477 (2023). The U.S. Supreme Court ruled here that the Secretary of Education lacked authority to execute blanket student loan forgiveness under emergency provisions of the Higher Education Relief Opportunities for Students Act (HEROES), holding that Congress did not expressly give the Secretary specific authority under the Act to "waive or modify" loan terms on such a sweeping scale. This was another instance of recent-vintage Supreme Court rulings invoking the "major questions doctrine" to constrain administrative autonomy to execute laws passed by Congress based on Executive branch professional expertise in various policy areas. *Id.*

340 *See* Jaclyn Lopez, *The major questions doctrine post-West Virginia v. EPA*, Am. Bar Ass'n Env't, Energy, & Res. Section (Jan. 3, 2023), https://www.americanbar.org/groups/environment_energy_resources/resources/trends/2023-january-february/major-questions-doctrine-post-west-virginia-v-epa/?abajoin=true [https://perma.cc/S7AB-RSAW].

341 Pub. L. No. 117-169 (2022).

342 597 U.S. 697 (2022)

343 *See* Ian Millhiser, *A new Supreme Court case could gut the government's power to fight climate change*, Vox (Nov. 3, 2021), https://www.vox.com/2021/11/3/22758188/climate-change-epa-clean-power-plan-supreme-court [https://perma.cc/A4HE-KTZX].

344 Opening briefs were filed by the State of West Virginia and co-petitioners with the D.C. Circuit Court of Appeals in November 2014. *See* Brief for Petitioners, West Virginia v. Env't Prot. Agency (In re Murray Energy Corp.), 788 F.3d 330 (D.C. Cir. June 9, 2015) (No.14-1146).

Court issued a stay that essentially froze the CPP in place pending the outcome of the legal challenges to its contents, which would not be resolved for several more years.[345] What made this sequence of events even more curious was that in 2019, the Trump Administration directed the Administrator of the EPA to repeal the CPP via executive order[346] and replaced it with the weaker, coal-friendly Affordable Clean Energy Rule.[347] Even after Joe Biden assumed the presidency, he stated that he would not seek to restore the Obama-era CPP.[348] Yet, the "zombie" regulation[349] at the heart of the *West Virginia* case continued to linger, and appeared to elicit an eagerness from conservative members of the Supreme Court to rule on the matter, regardless of its relevance to current environmental policy.[350]

The core of the high court's ruling relied upon the relatively recent legal dogma known as the "major questions doctrine," which holds that federal agencies cannot exercise power over matters of significant political or economic consequences unless Congress has clearly authorized such authority.[351] A central theme of this line of reasoning is the assertion that federal agencies routinely claim "highly consequential power beyond what Congress could reasonably be understood to have granted."[352] While several prominent cases have referenced this notion

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The final rules for the Clean Power Plan were not publicly released until August 3, 2015. *See FACT SHEET: Overview of the Clean Power Plan*, Env't Prot. Agency (2015), https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html#print [https://perma.cc/3L9X-UQVN].

345 It is noteworthy that the Supreme Court stay was granted without commentary on the merits of the petition. W. Va. v. E.P.A., 577 U.S. 1126 (2016).

346 Exec. Order No. 13,783, 82 Fed. Reg. 16093 (Mar. 28, 2017). The Executive Order instructed the Administrator of the EPA to review the CPP for compliance with the Executive Order's policies and to repeal the CPP if it was inconsistent with those policies. However, due to the DC Circuit Court of Appeals holding the CPP in abeyance until the Affordable Clean Energy Rule replaced it, the CPP was never formally repealed by the Administrator of the EPA. *See* 84 Fed. Reg. 32520 (Sept. 6, 2019).

347 84 Fed. Reg. 32520.

348 EPA Administrator-designate Michael Regan stated that the Biden Administration would opt for a "clean slate" approach based on the best information sources to develop its own GHG-reduction and power-efficiency strategies. *See* Jean Chemnick, *Biden won't revive Obama's clean power plan. So now what?*, E&E News (Feb. 9, 2021), https://www.eenews.net/articles/biden-wont-revive-obamas-clean-power-plan-so-now-what/ [https://perma.cc/7ZXD-R7A7].

349 *See* Ian Millhiser, *The Supreme Court appears eager to gut the EPA, but can't figure out how to do it*, Vox (Feb. 28, 2022), https://www.vox.com/2022/2/28/22954696/supreme-court-epa-west-virginia-clean-power-plan-brett-kavanaugh-samuel-alito [https://perma.cc/HF8P-ZR3C].

350 *Id.*

351 West Virginia v. Env't Prot. Agency, 597 U.S. 697, 699 (2022).

352 *Id*. at 724 (quoting Chief Justice John Roberts in his majority opinion in West Virginia v. EPA).

of administrative overreach,[353] this was the first instance in which it was explicitly adopted in the majority opinion.[354] Chief Justice Roberts posited that in cases of extraordinary "political and economic significance," agencies must be able to point to a "clear statement" from Congress endorsing their authority.[355] The "major question" here involved the CPP's projected means of reducing GHG emissions in existing power plants, specifically those burning coal.[356] The key affected categories were those power plants subject to new emissions standards that called for structural modification or conversion away from coal to cleaner generating systems.[357] Roberts argued that the costs of compliance with these conversions forced upon power plant operators by these new regulations were of such magnitude that, under this doctrine, they clearly exceeded the scope of EPA authority granted by Congress.[358]

This line of analysis highlighting the alleged burden placed upon power plant operators by outside the fence line measures under the CPP is deceptive in both its characterization and scope of the situation. First, coal-fired power plants not only create nearly double the aggregate GHG emissions of natural gas, but are also approximately one-third less efficient in energy conversion rates.[359] Second, most coal-fired plants are decades old and ripe for conversion or massive overhaul. Over 90% of existing plants were constructed before 1990, with half of these built before 1972.[360] In 2015 alone, some 94 coal-fired power plants were retired.[361] Coal demand in states previously heavily invested in it, such as Pennsylvania and Ohio, dropped precipitously

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353 One such case is FDA v. Brown & Williamson Tobacco Corp., 529 U.S. 120 (2000), in which the U.S. Food & Drug Administration was found to have exceeded its regulatory reach over the tobacco industry when it classified cigarettes (particularly) as drug-delivery systems. Congress later passed legislation expanding the FDA's authority over nicotine products; *see* Family Smoking Prevention and Tobacco Act, Pub. L. No. 111-31, 123 Stat. 1776 (2009).

354 West Virginia v. Env't Prot. Agency, 597 U.S. 697, 700 (2022).

355 *Id*.

356 Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35824 (June 3, 2016).

357 The language of the CPP references a new set of emissions standards for "new, modified and reconstructed power plants." *Id.*

358 *See* Andrew Twinamatsiko & Katie Keith, *Unpacking West Virginia v. EPA and Its Impact on Health Policy,* O'Neill Inst. (July 13, 2022), https://oneill.law.georgetown.edu/unpacking-west-virginia-v-epa-and-its-impact-on-health-policy/ [https://perma.cc/72CD-3YG9].

359 *See Natural Gas is More Efficient Than Coal-Fired Power Generation,* Certrec Newsl. (Nov. 14, 2022), https://www.certrec.com/blog/natural-gas-is-more-efficient-than-coal-fired-power-generation/ [https://perma.cc/D4ZR-RUBD] (Certrec is a supplier of regulatory compliance equipment in the energy field, headquartered in Fort Worth, Texas).

360 *See* Jack Fitzpatrick, *Coal Plants Are Shutting Down, With or Without Clean Power Plan*, Morning Consult (Mar. 3, 2016), https://morningconsult.com/2016/05/03/coal-plants-shutting-without-clean-power-plan/ [https://perma.cc/6QRX-75KQ].

361 *Id.*

between 2007 and 2015 by 44% and 49%, respectively.[362] All of these factors indicated a shift towards a rapidly shrinking coal sector years in advance of the appearance of the CPP, undermining the Supreme Court's characterization of this class of energy operators as handicapped by requirements for plant conversions that were never imposed, and were instead being undertaken *voluntarily* in response to efficiency and market considerations.[363]

An added element in the Supreme Court's majority opinion was its characterization of the Clean Air Act's call for the use of "best system for emission reduction"[364] ("BSER") as a gateway for the EPA to claim "an unheralded power representing a transformative expansion of its regulatory authority."[365] It is further labeled as vague and a "gap filler."[366] However, the large-scale power industry action commenced in *precisely* the fashion the CPP would have prescribed. The self-directed adoption of the BSER concept by the operators of these existing plants[367] which resulted in cleaner, more efficient power generation, stands in stark contradistinction to the fictional depiction of an oppressed industry portrayed in the majority opinion.[368]

It appears that the principal result of the *West Virginia* decision was to serve as the opening act for a veritable revue of present and future cases that audition for hearings before a conservative Supreme Court, inviting a wave of legal decisions showcasing the trendy "major questions" and "nondelegation" doctrines.[369] A torrent of prefabricated judgments seem poised to be issued in the near future that push back against perceived excesses of the "administrative state."[370] The current makeup of the high court, with a firm conservative majority entrenched for the foreseeable future, portends the possibility of strict limitations

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362 *Id.*

363 The percentage of electricity in the United States produced by coal-fired plants has dropped 60% since its peak in 2011, representing only about 20% of the total. *See* Silvio Marcacci, *So Much for Coal's Rebound—Plant Closures Come Roaring Back. It's Time to Unlock a Just Transition,* Forbes (Mar. 15, 2022), https://www.forbes.com/sites/energyinnovation/2022/03/15/so-much-for-coals-rebound-plant-closures-come-roaring-back-smart-policy-must-unlock-a-just-transition/?sh=58da60dd74e9 [https://perma.cc/EN6H-836A].

364 42 U.S.C. § 7411(a) (1970).

365 West Virginia v. Env't Prot. Agency, 597 U.S. 697, 700 (2022).

366 *Id.*

367 42 U.S.C. §7411(d) (1970).

368 *See* West Virginia, 597 U.S. at 714–15.

369 The authors argue that there is historical precedent for the rise of judicial backlash against perceived excessive deference by Congress to administrative entities. *See* Joseph Postell & Randolph J. May, *The Myth of the State Nondelegation Doctrines,* 74 Admin. L. Rev. 263 (2022).

370 *See* Matt Ford, *The Supreme Court Conservatives' Favorite New Weapon for Kneecapping the Administrative State*, New Republic (Mar. 13, 2023), https://newrepublic.com/article/171093/supreme-court-major-questions-doctrine-administrative-state [https://perma.cc/UE67-WHN2].

on executive branch initiatives of many stripes, including expanded restrictions on environmental initiatives.[371]

3. The New Methane Charge

On November 19, 2021, the House of Representatives passed President Biden's Build Back Better Act ("BBB").[372] While this legislation contained a host of public spending measures designed to cushion the economic blow delivered by the COVID-19 pandemic, it contained one novel feature—an unprecedented charge on methane emissions from specific types of power, industrial and commercial entities that are required to report their GHG emissions to the EPA.[373] For over two decades, some members of Congress have advocated attaching a price to GHG discharges via a carbon tax, cap-and-trade regime or emission fees.[374] Although the Senate did not ultimately pass BBB, it retooled a scaled back version, renamed the Inflation Reduction Act ("IRA").[375] To the surprise of many, the feature known as the Waste Emission Charge ("WEC"), which specifically targets methane discharges, was retained in the legislation, becoming the first federal levy of its kind.[376]

The WEC is administered through the addition of Section 136 of the Clean Air Act.[377] It levies a graduated annual fee on facilities that emit more than 25,000 metric tons (CO_2 equivalent) at a rate starting at $900 per metric ton of methane in 2024, $1,200 in 2025, and $1,500 for 2026 and beyond.[378] Exemptions are granted to well sites permanently sealed in the previous year, and to emission sources caused by "unreasonable delays" in permit processes for transmission pipelines.[379]

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371 *See id.*

372 Build Back Better Act, H.R. 5376, 117th Cong. (2021) (also referred to as the Budget Reconciliation Bill).

373 Jonathan L. Ramseur, Cong. Rsch. Serv., R46988, Build Back Better Act Methane Emissions Charge: In Brief (2021), https://www.congress.gov/crs-product/R46988 [https://perma.cc/E5H2-5LRZ]; *see also Greenhouse Gas Reporting Program (GHGRP)*, U.S. Env't Prot. Agency, https://www.epa.gov/ghgreporting [https://perma.cc/NP2D-9R7L].

374 *See* Jonathan L. Ramseur, Cong. Rsch. Serv., R45472, Market-Based Greenhouse Gas Emission Reduction Legislation: 108th through 118th Congresses (2024), https://crsreports.congress.gov/product/details?prodcode=R45472 [https://perma.cc/Y49E-6EVM].

375 *See* Pub. L. 117-169 (Aug. 16, 2022).

376 *See* Carrie Jenks, *The Inflation Reduction Act's Waste Emission Charge for Methane Emissions—What Did Congress Require and How is EPA Proposing to Implement the Program?*, Harv. L. Sch. Env't & Energy L. Program (Feb. 2, 2024), https://eelp.law.harvard.edu/the-inflation-reduction-acts-waste-emission-charge-what-did-congress-require-and-how-is-epa-proposing-to-implement-the-program/ [https://perma.cc/5QMX-9FTW].

377 *Id.*; established under the Clean Air Act, under the title, "Methane Emissions and Waste Reduction Incentive Program." Clean Air Act, 42 U.S.C ch. 85 § 7436 (LexisNexis, LEXIS through Pub. L. No. 119-3).

378 Clean Air Act, 42 U.S.C ch. 85 § 7436 (LexisNexis, LEXIS through Pub. L. No. 119-3).

379 *Id* § 7436(f)(5) (such exemptions are subject to a four-pronged test to qualify).

Under the IRA, some $850 million is earmarked for the program to devote to methane abatement improvements in "industrial equipment and processes," with an additional $700 million earmarked for similar purposes for low-producing "marginal conventional wells, which are notorious sources of methane leaks."[380] A methane and natural gas recovery program on federal and tribal lands is also being introduced through the BLM.[381] Royalties will be earned on methane and natural gas currently lost through venting, flaring, and well leaks. Revenues are expected to garner nearly $40 million and recover as much as 44.2 billion cubic feet from public land lessees per year.[382]

III. Assessment of the Inflation Reduction Act Methane Charge

Several difficulties confront the structure and effectiveness of this fee regime. First is a problem of differential measurement between the methane, which is measured by weight (metric tons), and natural gas streams for sale, which are calculated by volume (cubic feet). This renders accurate measurement extremely problematic.[383] Second, since the fee is only applicable to oil and gas operators, the range of coverage of the levy is severely limited.[384] Third, the fee's effective rate equates to only 0.2% of natural gas sent to sale for covered facilities.[385] This, combined with current threshold levels (25,000 metric tons of carbon dioxide equivalent) provide little incentive for significant control of leakage. Finally, the levy is estimated to generate only about $1.1 billion

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380 *See* Jonathan L. Ramseur, Cong. Rsch. Serv., R47206, Inflation Reduction Act Methane Emissions Charge: In Brief (2022), https://crsreports.congress.gov/product/pdf/R/R47206 [https://perma.cc/5UWV-QYJN]; *see also* Env't Def. Fund, By the Numbers: Marginal Oil and Gas Wells (2021), https://www.edf.org/sites/default/files/documents/MarginalWellFactsheet2021_0.pdf [https://perma.cc/V4KQ-XJ9X] (there are over half-million of these low-yield wells in the U.S., most owned by large oil and gas firms that do not want to spend money to mitigate the substantial methane leakages from these sources).

381 *See Interior Department Takes Action to Reduce Methane Releases on Public and Tribal Lands,* U.S. Dep't. Interior (Nov. 28, 2022), https://www.doi.gov/pressreleases/interior-department-takes-action-reduce-methane-releases-public-and-tribal-lands [https://perma.cc/T9JF-LBHZ].

382 *Id.* (Exemptions are granted in emergency situations in which gas is irretrievably lost or in dangerous situations in which short-term flaring is necessary to relieve excess well pressures).

383 *Overview of the Inflation Reduction Act Methane Fee*, BakerHostetler (Jan. 12, 2023), https://www.bakerlaw.com/insights/overview-of-the-inflation-reduction-acts-methane-tax/ [https://perma.cc/Q9TJ-M7UB].

384 Estimates suggest that the pending methane fee will be applicable to less than 30% of U.S. methane emissions. *See* Alex Muresianu, *Methane Fee to Take Effect in 2024: A Mini Carbon Price,* Tax Found. (Jan. 2, 2024), https://taxfoundation.org/blog/methane-fee-2024-carbon-price/ [https://perma.cc/6FAS-EM9F].

385 Ramseur, *supra* note 374.

in its first year, increasing to $1.9 billion by 2028.[386] However, with funds slated to be recycled into efficiency gains within affected oil and gas firms, this provides meager funds for the estimated 8000 facilities required to report their emissions to the EPA.[387] Significant adjustments to the program moving forward may also be problematic, given the restrictive atmosphere surrounding recent administrative initiatives, as evidenced in the *West Virginia* ruling.

A. Administrability

Establishing a practical and workable methane fee or tax requires several structural features: (1) the tax base, (2) determination of whether the levy is imposed "upstream" or "downstream," (3) the tax rate, (4) included exemptions or credits, and (5) measurement and monitoring mechanisms.[388] The more complex the overall structure, the greater the administrative burdens. The current methane fee features a narrow base confined to firms in the oil and gas industry that already report emissions to the EPA.[389] It taxes the upstream producer rather than the retail consumer and imposes a conspicuously low rate with numerous exemptions.[390]

For more than a decade, the EPA has collected emissions data from the largest industrial and utility emitters under the agency's Greenhouse Gas Reporting Program ("GHGRP").[391] Reporting facilities (those that exceed 25,000 metric tons CO_2-eq) account for over 85% of aggregate U.S. GHG emissions.[392] The EPA plans on eventually reducing the reporting threshold to 10,000 metric tons, which will cover a substantial number of additional methane emitters.[393] Reducing the threshold level

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386 *Id.* at 9.

387 *See* O'Melveny & Myers LLP, *Inflation Reduction Act Adds First-Time Charge for Methane Emissions for the Oil and Gas Sector* (Aug. 16, 2022), https://www.omm.com/insights/alerts-publications/inflation-reduction-act-adds-first-time-charge-for-methane-emissions-for-the-oil-and-gas-sector/ [https://perma.cc/GWV8-3SUG].

388 Nancy E. Shurtz, *Carbon Pricing Initiatives in Western North America: Blueprint for Global Climate Change Policy,* 7 San Diego J. Climate & Energy L. 61, 91-92 (2015-16) ("Whether a carbon tax or cap-and-trade system….both can be effectively designed with a broad base, a low cap/or high tax, and few? exemptions. Both…can be imposed "upstream" or "downstream." For a carbon tax, one must ….monitor.").

389 Muresianu, *supra* note 384.

390 Ramseur, *supra* note 374.

391 *Subpart W—Petroleum and Natural Gas Systems*, Env't Prot. Agency, https://www.epa.gov/ghgreporting/subpart-w-petroleum-and-natural-gas-systems [https://perma.cc/76WL-CQQ3].

392 *Learn About the Greenhouse Gas Reporting Program (GHGRP)*, Env't Prot. Agency, https://www.epa.gov/ghgreporting/learn-about-greenhouse-gas-reporting-program-ghgrp [https://perma.cc/5CU3-LLJP].

393 The projected 10,000 metric ton threshold, originally scheduled to commence in the third year of the program (2026), has been recalculated to an unspecified data, subject to certain uniform standards being met for covered sources of methane release, in compliance with the initial phase of

will not only increase the number of entities in the emissions-reporting pool, but will also raise the accuracy of the aggregate emissions data and substantially boost revenue raised from peak projections for the first phase of the program.[394] The industries that are constituent parts of the fee regime represent nine categories within the oil and gas production realm.[395] Some categories of methane sources will still not be covered, such as from agriculture, sinks, and certain indirect sources.[396] Exemptions apply for specialty categories of oil and gas exploration and drilling firms,[397]as well as portions of "downstream" distribution networks, entities that meet methane reduction standards under certain compliance exemption ceilings, and the aforementioned firms—such as those in pipeline infrastructure—affected by unreasonable delays in the permitting process.[398]

The methane charge is applied "upstream," or at the source rather than towards the consumer or market-delivery end. This design carries the advantage of involving fewer entities overall—aiding in the manageability of the system.[399] Imposing the levy at the source is also better-constructed to produce the quantity and quality of emissions measurement that promise best potential results and structure for necessary adjustments in the program.[400] However, upstream measurements become more difficult in certain sectors such as animal agriculture, where sources of methane releases, like beef cattle, are widespread. The complexity involved with covering these sources is a major reason they are excluded from this particular levy scheme. Agriculture is also a politically sensitive area in Congress, often leading to activities in this sector being intentionally excluded from environmental

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EPA's plan; *See* Bailey Bridges & L. Poe Leggette, *Methane Series Part III: Implementation is Here. EPA Published the Proposed Rule Implementing the First-Ever Direct Tax on Methane Emissions*, BakerHostetler (Feb. 8, 2024), https://www.jdsupra.com/legalnews/methane-series-part-iii-implementation-4450883/ [https://perma.cc/36ZP-EGFL].

394 Muresianu, *supra* note 384.

395 These include offshore and onshore natural gas production, gathering and boosting (pipeline and other extraction and transport) activity, underground natural gas storage, liquid natural gas import, export and storage. *See GHGRP Petroleum and Natural Gas Systems Sector Profile*, Env't Prot. Agency, https://www.epa.gov/ghgreporting/ghgrp-petroleum-and-natural-gas-systems-sector-profile [https://perma.cc/ABX8-2G8J].

396 *Subpart W—Petroleum and Natural Gas Systems*, *supra* note 391.

397 *GHGRP Petroleum and Natural Gas Systems Sector Profile*, *supra* note 395.

398 *Id.*

399 *Subpart W—Petroleum and Natural Gas Systems*, *supra* note 391.

400 It is estimated that 75% of anthropogenic methane releases worldwide occur from upstream sources. *See* Xingxiang Yang et al., *Direct measurement of methane emissions from the upstream oil and gas sector: review of measurement results and technology advances (2018-2022)*, 414 J. of Cleaner Prod. 137693 (2023), https://www.sciencedirect.com/science/article/abs/pii/S0959652623018516 [https://perma.cc/R9RW-Y9F3].

legislative initiatives.[401] In fact, recent appropriations legislation in Congress limited EPA regulation of GHG emissions in the meat and dairy industries.[402]

B. Efficacy

One of President Biden's aims in the IRA was to integrate climate reform measures into his economic development efforts.[403] In keeping with the themes of broad-based strategies that incorporate cleaner growth components, an effective methane fee regime should also be broad, including as many sources of emissions as possible. The taxable threshold should be low, the rate reasonably high, and the number of exemptions kept to a minimum. Unfortunately, these elements are not present in the current methane fee regime.

First, the base is inadequately narrow. As mentioned earlier, upstream sources such as gathering pipelines are exempt,[404] as well as numerous downstream sources of methane, such as in landfill sites and local distribution networks.[405] When such major sources of emissions are excluded from the base, we are left with a levy that is estimated to apply to just 29% of aggregate U.S. methane volume.[406] Adding more categories of emission sources creates challenges of measurement and system complexity, but must be inclusive enough to effectively alter human behaviors and be a disincentive to produce damaging pollutants.[407]

Second, the tax rate is set at too low a level to internalize costs of environmental damage and incentivize firms to reduce methane

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401 Cong. Rsch. Serv., R41622, Environmental Regulation and Agriculture (2014), https://www.everycrsreport.com/reports/R41622.html [https://perma.cc/KHR9-N3RV].

402 Nathan Halverson, *US gives meat producers a pass on climate change emissions*, Reveal (Dec. 22, 2015), https://revealnews.org/article/us-gives-meat-producers-a-pass-on-climate-change-emissions/ [https://perma.cc/7JBP-GMPP].

403 Investments in such areas as electric cars and solar power generation have jumped markedly since passage of the Inflation Reduction Act. *See* Jim Tankersley, *Biden's Climate Law is Reshaping Private Investment in the United States,* N.Y. Times (Sept. 13, 2023), https://www.nytimes.com/2023/09/13/us/politics/biden-climate-law-investment.html [https://perma.cc/ZU42-QHTH].

404 Gathering pipelines carry unprocessed natural gas from production sites to refinement facilities. They are largely unregulated and have become increasing sources of methane leakage. *See* Kenneth Clarkson, *Gas Gathering Pipelines,* Pipeline Safety Tr. (June 24, 2022), https://pstrust.org/gas-gathering-pipelines/ [https://perma.cc/GRZ4-D3FP].

405 Studies of local natural gas distribution networks found consistent methane leakage well in excess of EPA estimates, especially in large, established urban zones, which typically have older infrastructure. *See Methane Research: The 16 Study Series,* Env't Def. Fund (June 23, 2018), https://www.edf.org/climate/methane-research-series-16-studies [https://perma.cc/7A67-JMEQ].

406 Muresianu, *supra* note 384.

407 *See* Ctr. for Climate & Energy Sols., Options and Considerations for a Federal Carbon Tax (2013), https://www.c2es.org/wp-content/uploads/2013/02/options-considerations-federal-carbon-tax.pdf [https://perma.cc/DD88-PG9F].

discharges.[408] In addition, the 25,000 metric ton (CO_2-eq) threshold for initial imposition of the fee[409] dramatically lowers the effective percentage of methane covered by the program to an ineffectual level equivalent to just 0.5% of total GHG discharges in the U.S.[410] Add to this the low initial levels of the fee in the first year (2024) of $900 per metric ton of methane—or just $36 per metric ton ($CO_2$-eq)[411]—and we have a formula for low expectations surrounding the effectiveness of the regime—at least in its early stages.[412]

Naturally, prices on emissions can be adjustable, which is important for purposes of incentivizing abatement measures. Specified prices add a degree of "cost certainty" into the design equation.[413] At the same time, static prices do not allow for fluctuation in market demand for energy production, which will affect the level of emissions.[414] This was illustrated starkly in 2022 when global petroleum supplies were squeezed by Russia's invasion of Ukraine, Arab oil suppliers' restriction on production to keep market prices high, and the U.S. battling the dual specters of domestic inflationary pressures and increased petroleum demand.[415] President Biden, despite basing his presidential campaign partially on supporting policies that would transition America's economy away from fossil fuel dependence, instead ordered an increase in domestic oil and gas production.[416] Despite higher prices for gasoline due to supply chain difficulties and price gouging by oil companies, consumer demand recovered roughly to pre-COVID levels in 2022,[417]

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408 The concept of taxing parties who create widely dispersed adverse social costs (e.g. pollution) was pioneered by English economist A.C. Pigou. *See* Pigou, s*upra* note 13.

409 *Learn About the Greenhouse Gas Reporting Program (GHGRP)*, *supra* note 392.

410 In the first year of the program (2024) the tax will cover just 31 million metric tons (CO_2-eq) out of a total U.S. GHG volume of over six *billion* metric tons (CO_2-eq). *See* Muresianu, *supra* note 384.

411 *See* Muresianu, *supra* note 384.

412 *Id.*

413 *See* Reuven S. Avi-Yonah & Daniel M. Uhlmann, *Combating Global Climate Change: Why a Carbon Tax is a Better Response Than Cap-and-Trade*, 28 Stan. Env't. L. J. 3 (2009).

414 *Id.* at 36. The authors refer to the unknown effects of static carbon tax prices on future emissions levels "benefit uncertainty."

415 *How Does the War in Ukraine Affect Oil Prices?*, World Econ. F. (Mar. 4, 2022), https://www.weforum.org/stories/2022/03/how-does-the-war-in-ukraine-affect-oil-prices/ [https://perma.cc/2ZQM-MKUZ]. The combination of crisis in Europe and domestic economic woes contributed to the defeat in Congress of President Biden's ambitious Build Back Better legislation, which included numerous federal initiatives to develop "green" technologies and fund climate mitigation programs. *See* Timothy Gardner & Jarrett Renshaw, *Global energy crisis, Russia invasion eclipse Biden climate goals,* Reuters (Apr. 21, 2022), https://www.reuters.com/business/environment/global-energy-crisis-russia-invasion-eclipse-biden-climate-goals-2022-04-21/ [https://perma.cc/V5E8-C8PK].

416 *Global Energy Crisis, Russia Invasion Eclipse Biden Climate Goals*, *supra* note 416.

417 *Average Supply of Finished Motor Gasoline in the United States from January 2020 to December 2023,* Statista (2024).

a byproduct of observed "sticky demand" due to volatile short-term conditions,[418] including post-COVID phenomena such as "revenge travel."[419] Such undulating short-term effects on supply, demand, price and consumption rates illustrate the need for careful regard of the effects of a tax or fee introduced into the targeted marketplace.

In setting the initial price on methane or carbon, a balance must be struck between a level that will create emissions reductions, but without creating adverse effects such as decreased overall economic activity or inequitable impacts on certain populations. A study conducted at the Massachusetts Institute of Technology analyzed multiple models in which a carbon tax was introduced and revenues generated returned to the economy.[420] Two different starting price levels ($25 and $50 a ton of CO_2) and two different percentage increases (2% and 5% annually) were used.[421] Unsurprisingly, the models with the higher fee levels and higher increase schedules produced the most emission reductions, although all models saw meaningful results on that front.[422] However, the most variable results occurred in the revenue portion of the models. Outcomes varied widely depending on whether the monies were recycled back to taxed businesses in lower capital taxes, to the public in the form of individual tax breaks, or direct rebates to affected households.[423] One of the aspects of a carbon tax or fee system that is most touted is its relative simplicity. Tax rates can be easily adjusted according to emission reduction outcomes.[424] If an initial level on GHG emissions, such as

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418 "Sticky demand," a term for modest decreases in demand for products after sharp increases in their prices, has been observed for gasoline consumption. Typically, a sudden spike in prices has been followed by longer periods of gradual price modulation. The anticipation of continued price decreases has buoyed product demand above levels that would have been predicted by the higher general price levels. *See* Charles Komanoff, *We Explain Gasoline Demand (including why it's sticky)*, Carbon Tax Ctr. (May 12, 2008), https://www.carbontax.org/blog/2008/05/12/we-explain-gasoline-demand-including-why-its-sticky/ [https://perma.cc/KC4K-Z4LK].

419 "Revenge travel" is a term used to describe travelers "wanting to make up for the time and experiences lost to the pandemic." Manuela López Restrepo, *'Revenge travel' is surging. here's what you need to know*, NPR, (Jun. 16, 2022), https://www.npr.org/2022/06/16/1105323610/flight-tickets-inflation-pandemic-revenge-travel-vacation-europe-recession [https://perma.cc/TMY4-GP8X].

420 *See* David L. Chandler, *Carbon taxes could make significant dent in climate change, study finds*, MIT News (Apr. 6, 2018), https://news.mit.edu/2018/carbon-taxes-could-make-significant-dent-climate-change-0406 [https://perma.cc/UNS2-26QK].

421 *Id.*

422 *Id.*

423 *Id.* (Lower taxes for firms that paid the tax grew the economy faster but proved regressive for low-income consumers. Household rebates erased the regressive elements but had the lowest impact on economic growth. Individual tax cuts displayed the lowest overall results, combining less than optimal economic growth with lingering regressive impacts on low-income populations).

424 Avi-Yonah & Uhlmann, *supra* note 413, at 32-33 ("If the carbon tax did not produce the desired reduction in carbon dioxide emissions, the tax would be increased; if the tax "overcorrected" and produced greater than anticipated reductions, it could be decreased.").

methane, is set high enough and measurement of sources can be reasonably overcome, sufficient evidence exists to suggest that such a levy *will* produce raw reductions, at least initially. However, unknown adjunct effects could remain in terms of fostering efficiency gains or economic performance and equity across different socioeconomic populations.[425]

The approach to tackling the methane component of the larger GHG problem is daunting because of its unique characteristics in the matrix. It holds heat at 80-times the capacity of carbon dioxide.[426] It composes 11.5% of GHG volume in the atmosphere,[427] but possesses about 30-times the warming potential than CO_2 over 100 years.[428] It is already responsible for 30% of anthropogenic global warming since the Industrial Revolution.[429] Massive quantities of previously undetected atmospheric methane are being discovered with new technologies.[430] The ability of methane to dramatically accelerate the pace of climate warming sounds an alarm of urgency. Since 90% of human-caused emissions in the U.S. come from known sources,[431] efforts should concentrate on these areas to combine recognition, measurement, and calculation of an aggressive tax or fee on methane to start reining in this runaway threat.

C. Efficiency & Economic Growth Factors

The rate and base of any methane fee apparatus will necessarily impact efficiency as well as aggregate growth on an economy-wide scale. In general, as rates increase and the base broadens, the impacts on both the micro and macro levels increase. Another major factor is the jurisdictional reach of the entity imposing the tax or fee. Effects of a levy on economic entities operating within a municipal or state jurisdiction will be potentially quite different from those affected by a regional or national tax. One possible effect of taxes imposed on a local basis is that it can inspire what is known in economics as "leakage," which can take

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425 *See* James K. Boyce, *Carbon Pricing: Effectiveness and Equity,* 150 Ecological Econ. 52, 52-61 (2018) (the author argues that since meaningful emissions reductions are sure to carry an economic cost borne by consumers, revenues from carbon levies should be returned to end users in the form of "per capita dividends").

426 Vaidyanathan, *supra* note 18.

427 *Overview of Greenhouse Gas*, *supra* note 37.

428 Vaidyanathan, *supra* note 18.

429 *See Methane emissions are driving climate change. here's how to reduce them*, U.N. Env't Programme (Aug. 20, 2021), https://www.unep.org/news-and-stories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them [https://perma.cc/LV5R-JDQU].

430 *See* Debra Werner, *Not Invisible Anymore: Satellites reveal sources of atmospheric methane,* Space News (Jan. 25, 2024), https://spacenews.com/satellites-reveal-sources-of-atmospheric-methane/ [https://perma.cc/L73S-S354].

431 These sources are from fossil fuels, agriculture and waste, disscussed *supra* in Part I, Section B-D. Ravishankara et al., *supra* note 25.

various forms. The simplest example is the case of individuals moving their residences to another state with lower taxes.[432] It can also take the form of business interests taking advantage of low tax, low cost operating locations and then exporting the profits from these ventures out of the area.[433] However, businesses that are subject to carbon levies generally are not in sectors of the economy that lend themselves to mobile operations.[434] They tend to be situated in heavy industry or power generation.[435] They conduct their activities in a locale because of customer base, access to markets, quality of infrastructure, and similar factors.[436] The main sources of leakage are the costs borne by the public from the production of harmful pollutants, also known as externalities.[437]

Evidence of any leakage or tax flight attached to a carbon tax or cap-and-trade scheme in the U.S does not exist. The reasons are obvious. First, no national taxing regime can be used as a reference since the federal methane is just taking effect in 2024, with minimal impacts expected initially due to its low threshold and rate schedule.[438] The California cap-and-trade program is concentrated on a relatively limited group of big GHG emitters in the power generation, oil and gas production, and heavy manufacturing industries.[439] Since the vast majority of these players are entrenched in California's infrastructure and unique

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432 Studies have shown that local tax rates influence residence decisions of certain populations. In 2023, data showed that in the 18 states with aggregate tax burdens above the national average, 14 of them experienced a net out-migration of residents. Conversely, 24 of the remaining states with tax regimes at or below the average witnessed net population increases. The data were found to have statistical significance, even when adjusted for other factors such as overall cost of living. *See* Katherine Loughead, *Americans Moved to Low Tax States in 2023,* Tax Found. (Jan. 9, 2024), https://taxfoundation.org/data/all/state/state-population-change-2023/ [https://perma.cc/TZ6G-6ZF8].

433 The tourist industry is notorious for this phenomenon. *See* Sarah Faith, *Tourism's dirty secret: What is tourism leakage and how can you avoid contributing to it?*, Euronews Travel (Feb. 26, 2023), https://www.euronews.com/travel/2023/02/26/tourisms-dirty-secret-what-is-tourism-leakage-and-how-can-you-avoid-contributing-to-it [https://perma.cc/78S2-642S].

434 *See Power and Petrochemicals Dominate Mobile Water and Wastewater Treatment—Will Oil & Gas Outpace Growth?*, Frost & Sullivan (May 16, 2017), https://www.frost.com/news/press-releases/energy-environment-press-releases/power-and-petrochemicals-dominate-mobile-water-and-wastewater-treatment-will-oil-gas-outpace-growth/ [https://perma.cc/AQA7-8GKK] (Oil and gas production facilities, utilities, and municipal landfills by their very nature are not easily mobile).

435 *See* Hannah Ritchie & Pablo Rosado, *Which countries have put a price on carbon?*, Our World Data (Oct. 14, 2022), https://ourworldindata.org/carbon-pricing [https://perma.cc/UTC2-ZEQ7] ("For example, heavy industry or household electricity might have a carbon tax, but road transport might not.").

436 *See* Scott Thie, *5 Major Energy and Utilities Industry Challenges 2022,* Getac (Nov. 30, 2021), https://www.getac.com/us/blog/five-energy-utilities-industry-challenges/ [https://perma.cc/G7DD-H5LY].

437 *See* Pigou, *supra* note 13 (discussing the general theory of externalities).

438 *See* Jenks, *supra* note 376.

439 *See* Durning & Bauman, *supra* note 216.

market base, leakage of these emitters to other jurisdictions is not only unlikely, but in most cases impossible. The other sizable cap-and-trade regime in the U.S.—the RGGI—is based on a narrow band of carbon-fueled power producers in the northeastern states.[440] This is a state-sanctioned collective venture restricted to parts of the embedded regional infrastructure.[441] It is considered a revenue neutral program, but with member state investments in local regenerative resource ventures, local economic development and low-income support, RGGI has been widely deemed a success on the economic development front.[442]

Assessment of these types of pricing regimes on broader terms is problematic because of the relatively narrow breadth of application of the small sample available. The California case, representing a population of 40 million and an economy that would rank in the top five globally, shows promise because of the relative breadth of coverage of its cap-and-trade regime, integrated with carbon-reduction fuel program, vehicle efficiency standards, and resource recovery efforts. Big gaps remain in its regime, however, since the transportation sector is still the biggest single contributor to GHG emissions in the state.[443] Downstream carbon levies may be required to inject a more comprehensive dimension to the effort. Methane, with its multiplicity of major sources and dangerous thermal capabilities, sends the signal that only a comprehensive policy approach can hope to halt the accelerating advance of climate warming.

D. Equity and Incidence Factors

Any discussion of the taxation of the production and consumption of harmful carbon-based emissions should include consideration of the parties who *should* pay these levies. It has been demonstrated that these hazardous substances emanate from both production processes and these products' consumption. It can be reasonably argued that the burden for the costs associated with these hazards should be borne by those who *command* these production and consumption activities. To this end, a 25-year longitudinal study of the global distribution of GHG emissions revealed that the wealthiest 10% of the population are responsible for over half of carbon emissions over that period, with decreasing shares following suit as wealth and income decrease.[444]

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440 *See Regional Greenhouse Gas Initiative (RGGI)*, *supra* note 273.

441 *See id.*

442 *See* Stuart & Hibbard, *supra* note 274.

443 About 40% of the total GHG discharges. *See AB 32 Global Warming Solutions Act of 2006*, *supra* note 212.

444 *See* Sivan Kartha et al., *The Carbon Inequality Era: An assessment of the global distribution of consumption emissions among individuals from 1990 to 2015 and beyond,* Stockholm Env't Inst. (2020). The top 1% of wealth-holders were found to command, through investments, luxury

Whether one endorses a canon of strict proportional liability for a taxable act, or a progressive "ability to pay" model, it seems clear that the world's wealthy—who own the majority of the carbon resources and are the most conspicuous consumers—should assume the lion's share of financial responsibility for combating the threatening conditions they continue to feed.[445]

Developmental economists Andrew L. Fanning and Jason Hickel have calculated that on a comparative wealth basis, the wealthiest nations would need to transfer $192 *trillion* to the less-developed world (where most of the world's population resides) to compensate them for atmospheric poisoning and climate-related damage.[446] Similarly, a pair of climate scientists at Dartmouth College calculated that the U.S. has contributed almost $2 trillion in damage to other nations' economies in the last quarter-century through its contribution to climate warming, while benefiting to the tune of some $183 billion.[447] Translated to the theme of compensation to those adversely affected by climate change in the U.S., it makes a strong case that in the case of revenue distribution for carbon taxes, such as on methane, some material transfer is justified to low-income, low-wealth populations who are most adversely affected by climate change.[448] This position is bolstered by the virtual certainty that a portion of the costs of a carbon levy will be absorbed by consumers in the form of higher utility bills and transportation costs, such as gasoline.[449]

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assets, travel practices, etc., the production of about 15% of global anthropogenic GHG discharges. Meanwhile, those in the lower 50% of the wealth scale, many of whom live in poverty or subsistence conditions, were responsible for just 7%.

445 *See* Andrew L. Fanning & Jason Hickel, *Compensation for atmospheric appropriation,* 6 Nature Sustainability 1077 (2023).

446 *Id.* The authors calculate that at the current rate of inaction by developed nations in addressing the GHG emission crisis, the target of 1.5ºC temperature rise will be eclipsed by a factor of three (approximately 4.5ºC).

447 Two Dartmouth climate science researchers, Christopher Callahan and Justin Mankin, calculated that a number of other nations in northern latitudes, such as Canada and Russia, monetarily benefited from longer agricultural growing seasons due to climate warming. *See* Seth Borenstein & Drew Costley, *Rich nations caused climate harm to poorer ones, study says,* Associated Press (July 12, 2022), https://apnews.com/article/climate-russia-ukraine-science-united-states-226702e6d195c94433cdc48e5fed6e63 [https://perma.cc/3SMY-DJGU].

448 An EPA study revealed that poor people and populations of color are disproportionately affected by climate change in several areas, including increased health problems, poor air quality, excessive heat, increased weather-related work disruptions, and property damage from storms and floods. *See EPA Report Shows Disproportionate Impacts of Climate Change on Socially Vulnerable Populations in the United States,* Env't Prot. Agency (Sept. 2, 2021).

449 Scenarios of distribution of carbon levy proceeds across 11 geographic regions revealed that funds that went to support the two lowest income decile populations experienced a boost in consumer buying power ("consumer surplus gain") of between 1.2% and 3.8%. *See* Dallas Burtraw, Richard Sweeney & Margaret A. Wells, *The Incidence of U.S. Climate Policy: Where You Stand*

E. Revenue Generation Prospects

The Tax Foundation estimates that the revenues generated by the Waste Emission Charge or methane fee will start at approximately $1.1 billion in 2025 and climb to $1.9 billion in 2028.[450] Additional funds of another $1.55 billion authorized under the Inflation Reduction Act are being funneled to the EPA and Department of Energy (DOE) for efficiency upgrades and containment of methane leaks in marginal wells.[451] On its face, this may appear to be a lot of money to jump-start a program. However, an examination of just one of the targets for these funds reveals these resources are quite modest given the enormity of the tasks to which they are to be applied. For instance, $700 million is earmarked for the plugging of methane leaks in the aforementioned marginal wells.[452] These are defined as low-production oil and gas wells, many poorly maintained, and are significant sources of leaked GHGs, particularly methane.[453] These represent 80% of all operating oil and gas wells in the nation, and number in excess of 500,000.[454] The majority of these are owned by large, profitable companies that could fix or plug leaky sites, but decline to do so.[455] One firm, Diversified Energy Co, as of 2021 owned 69,000 wells—the most in the U.S.—the majority of which fit the definition of "marginal."[456] The company is only required to plug 20 leaking wells per year in each of the four states in which it has large holdings, though it owns some 3000 idle wells that are candidates for permanent retirement.[457] It is unknown whether funds from the federal effort to curtail methane leakage in these aging and orphaned wells will be used to effectively subsidize corporate irresponsibility.[458]

The scope and seriousness of this single aspect of the methane (and overall GHG) problem drives home the reality that revenue generation

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Depends on Where You Sit, Res.s for the Future (Sept. 15, 2008), https://www.rff.org/publications/working-papers/the-incidence-of-us-climate-policy-where-you-stand-depends-on-where-you-sit/ [https://perma.cc/8AZN-YCZV].

450 Muresianu, *supra* note 384.

451 Ramseur, *supra* note 374.

452 *Inflation Act Tracker; IRA Section 60113—Methane Emissions Reduction Program,* Env't Def. Fund, https://iratracker.org/programs/ira-section-60113-methane-emissions-reduction-program/#:~:text=Section%2060113%20appropriates%20%241.55%20billion,available%20until%20September%2030%2C%202028 [https://perma.cc/7RBW-U9JS].

453 "Marginal wells" are defined as producing less than 15 barrels of oil or 90,000 cubic feet of natural gas per day. Env't Def. Fund, *supra* note 380.

454 *Id.*

455 *Id.* (A 2021 survey identified 93 companies that owned over 1000 active well sites).

456 *See* Zachary R. Mider & Rachel Adams-Heard, *An Empire of Dying Wells,* Bloomberg (Oct. 12, 2021), https://www.bloomberg.com/features/diversified-energy-natural-gas-wells-methane-leaks-2021/ [https://perma.cc/8J5K-SXJY].

457 *Id.*

458 *Id.*

is an unrealistic outcome of proposed carbon or methane levies. They should properly be viewed as necessary measures that reflect some facsimile of the true costs of economic practices that inflict a degree of harm to society and the environment. The pursuit of short-term gains has, in many cases, produced more comprehensive damage than the monetary value of their realized profits.[459]

This sobering reality showcases the need for a reset of priorities in both the public and private relationships to a functioning society. Even if programs such as the Biden methane fee makes some progress on the emission abatement front, ultimate progress will occur when our notion of economic success changes. Carbon taxation is not going to ever be a budget fixer. However, it may be a necessary tool to aid transitioning to a more thoughtful and community-minded approach to abundance. To be sure, as many resources as possible *should* be committed to a mixture of damage repair and compensation to the human and natural victims of human-caused climate change. Going forward, new initiatives require a foundation based on collective concerns, protection of the vulnerable, and a focus on long-term consequences. It starts by acting responsibly and appropriately now.

F. Political Feasibility Issues

Winston Churchill once described America as being "like a giant boiler. Once the fire is lighted under it, no limit exists to the power it can generate."[460] Even if the quotation is inappropriate to a discussion of avoidance of "boiling" the planet, the analogy is quite fitting for collective American politics. Unless situations reach the point of imminent catastrophe, the federal government in Washington D.C. is content to maintain the status quo. In the environmental realm, this means public pronouncements and pledges at international conferences, but few substantive or binding commitments. Bold action is generally viewed as too risky—that is, there is always another election on the horizon.

However, exceptions on the record do happen. One such case was President Biden's Waste Emission Charge,[461] which was passed by Congress as the country was struggling to recover from the debilitating

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459 A global study of 15,000 publicly traded companies revealed that nearly 90% of direct anthropogenic GHG emissions emanate from four economic sectors: utilities, material supply, energy, and transportation. The combined monetary damages caused by climate-caused damage, such as sea rise, wildfires, intense storms, flood and droughts, etc., exceeded the profits of these enterprises. *See* Michael Greenstone et al., *Mandatory disclosure would reveal corporate carbon damages*, 381 Science 837, 839 (2023), https://www.science.org/doi/10.1126/science.add6815 [https://perma.cc/9ENR-YK4R].

460 3 Winston S. Churchill, The Second World War: The Grand Alliance (1950).

461 Inflation Reduction Act, P.L. No. 117-169, § 136, 136 Stat. 1818, 2074 (2022).

public health crisis of the COVID pandemic.[462] Since there is no similar crisis knocking on the national doorstep at present, a standalone version of the WEC would probably not survive a floor vote in either legislative chamber. A similar case occurred in 2022. The U.S. Senate ratified a climate accord[463] reached several years prior to eliminate international use of the chemical class known as chlorofluorocarbons found to damage the atmosphere's protective ozone layer, but best known for their former use in consumer products (e.g. hairspray) and still widely employed in industrial processes as a refrigerant.[464] The key to the treaty's adoption was that it was hidden inside larger legislation that included COVID-related economic stimulus funds.[465]

These cases illustrate the difficulty of passing any legislation with a tag that involves a perceived sacrifice of one sort or another. This is especially true when considering any climate-related legislation, especially if it involves something as bald-faced as a methane tax. The chief barriers to meaningful congressional action in this arena involve two main factors. First, the heightened tribalism in Congress showcases increasing allegiance to party *brand* rather than to political philosophy. This is evidenced by the surge in registered voters who identify themselves as Independents.[466] Since most non-affiliated voters are self-described moderates,[467] they tend to eschew adjunct features of sanctioned partisan

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462 The uniqueness of the situation did not even meet the textbook definition of a "recession." *See* Eric Milstein & David Wessel, *What did the fed do in response to the COVID-19 Crisis?*, Brookings Inst. (Jan. 2, 2024), https://www.brookings.edu/articles/fed-response-to-covid19/ [https://perma.cc/8V6F-E85U].

463 *See* Press Release, U.S. Dep't. of Sate, U.S. Ratification of the Kigali Amendment (Sept. 21, 2022), https://2021-2025.state.gov/u-s-ratification-of-the-kigali-amendment/ [https://perma.cc/66JP-BJNK].

464 *Phaseout of Ozone-Depleting Substances*, Env't Prot. Agency, https://www.epa.gov/ods-phaseout [https://perma.cc/56N4-P5CQ].

465 21 Republicans joined 48 Democrats in reaching the required two-thirds majority vote that treaty ratifications require. *See* Robinson Meyer, *The Senate Just Quietly Passed a Major Climate Treaty,* The Atlantic (Sept. 28, 2022), https://www.theatlantic.com/science/archive/2022/09/congress-climate-policy-hydrofluorocarbons-kigali-amendment/671579/ [https://perma.cc/JA94-H3YJ].

466 A recent Gallup poll of registered voters showed a record percentage identifying as non-affiliated. Democrats (27%) dipped to a new modern low, tying Republicans, who continued their 20-year trend under 30 percent. *See* Jeffrey M. Jones, *Independent Party ID Tied for High; Democratic ID at New Low,* Gallup (Jan. 12, 2024), https://news.gallup.com/poll/548459/independent-party-tied-high-democratic-new-low.aspx [https://perma.cc/J8RC-KBZ7].

467 These voters were found to have almost equal numerical "leanings" in their preferences for Republican or Democratic policies on major issues but were less engaged in political causes than their partisan counterparts. *Political Independents: Who They Are, What They Think*, Pew Rsch. Ctr. (Mar. 14, 2019), https://www.pewresearch.org/politics/2019/03/14/political-independents-who-they-are-what-they-think/ [https://perma.cc/LSN2-D2P8].

party functions, including participation in party primary elections.[468] This results in more party loyalists reaching the general elections, and by extension, the halls of Congress. Both legislative chambers under the Capitol's dome are essentially evenly split along party lines. Add to this built-in obstructionist procedural rules, such as the Filibuster Rule, that requires a 60-vote majority just to get a pending bill to a vote, and it becomes obvious why Congress is not fertile ground for the historical linchpin of legislative success: compromise.[469]

The second factor that diminishes the prospects for passage of a methane tax or other major carbon levy is the lack of urgency for action in the minds of American citizens. In a 2023 Pew Research survey about attitudes towards climate change, only 23% of those who identified themselves as Republicans viewed it as a legitimate threat.[470] Even though 78% of self-identified Democrats responded that climate change is a serious hazard,[471] they also ranked it eighth in a list of top public priority issues.[472] With little or no groundswell of popular political pressure to galvanize the process, major climate legislation will gather dust on Capitol Hill for the time being.

There is also debate about comparative public and political preferences for the two main modes of proposed carbon levy schemes: cap-and-trade and a carbon tax. Most analysis over the years has concluded that cap-and-trade was preferred generally by consumers and politicians because it was not thought of as a "tax"—which is often a nonstarter at the ballot box.[473] Conversely, it has long been known that most power companies and industrial players (and their lobbyists) see carbon taxes and other downstream devices as preferred

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468 Data for the 2022 political primary season show that in states with closed (single party) elections, voter turnout averaged just 20.7%. However, for states that allowed registered voters from all party affiliations to participate, turnout was boosted to just 24.5%. *See* Jennifer Ruff, *Nearly 80% of Eligible Voters Don't Participate in Primaries,* Bipartisan Pol'y Ctr. (Mar. 7, 2023), https://bipartisanpolicy.org/press-release/voters-dont-participate-primaries/ [https://perma.cc/P68F-CKB5].

469 "It becomes evident that party loyalty has supplanted reason and individualism for many people; it has become the mainstream, not the fringe." *See* Armstrong Williams, *Party loyalty will be our end*, The Hill (Oct. 22, 2022), https://thehill.com/opinion/campaign/3693552-party-loyalty-will-be-our-end/ [https://perma.cc/CAZ2-4SLZ].

470 *See* Alec Tyson et al., *What the data says about Americans' views of climate change*, Pew Rsch. Ctr. (Aug, 9, 2023), https://www.pewresearch.org/short-reads/2023/08/09/what-the-data-says-about-americans-views-of-climate-change/ [https://perma.cc/P5NP-46XA].

471 *Id.*

472 Republicans ranked climate change tied for the 19th spot out of 21 categories of public policy priorities ---just above the COVID pandemic. *See Economy Remains the Public's Top Policy Priority; COVID-19 Concerns Decline Again,* Pew Rsch. Ctr. (Feb. 6, 2023), https://www.pewresearch.org/politics/2023/02/06/economy-remains-the-publics-top-policy-priority-covid-19-concerns-decline-again/ [https://perma.cc/Q3KH-VTMF].

473 David J. Hardisty et al., *A carbon price by another name may seem sweeter: consumers prefer upstream offsets to downstream taxes*, 66 J. Env't. Psych. 1, 2 (2019).

policy vehicles, mostly because they provide cost certainty that can be calculated in their business plans.[474] There appears to be no clear-cut frontrunner between these two likely policy models for future legislative action.

IV. Alternatives & Suggestions for Change

One of the clear aims of this Article is to illustrate that while any policy measure aimed at reducing dangerous methane emissions is a positive step, the multiplicity of methane sources requires a more comprehensive approach to make meaningful inroads in this area. It also represents the need for broad-based approaches that include nationwide measures to span the entire GHG spectrum in the United States. Adoption of a set of federal carbon taxes would achieve significant progress in this mission and establish America as a global leader in climate change abatement.

A. The Vigorous Debate on Instrument Choice

Debate has endured amongst a diverse array of constituent groups—politicians, environmentalists, economists, business interests—on the nature and scope of the climate issue and what, if anything, should be done about it. Some still favor direct governmental regulation as the preferred policy approach,[475] while direct taxation and cap-and-trade systems both have their proponents. By contrast, an entire brand of political strategy uses denialism as a deliberate tool of influence, exemplified by the characterization of climate change as a hoax.[476]

Traditional environmentalists have advocated for a leading role for direct regulation, due to their emphasis on quantifiable results.[477] However, a major limitation of this approach is that observable desirable results (i.e., measurable reduction of harms) are nonlinear in terms of costs at the margins for attaining higher total abatement of these harms.[478] This is a principal reason why economists tend to favor market

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474 Avi-Yonah & Uhlmann, *supra* note 413, at 42-4.

475 *See* William Boyd, *The Poverty of Theory: Public Problems, Instrument Choice, and the Climate Emergency,* 46 Colum. J. Env't L. 399, 404 ("[L]ongstanding critiques from the left have tended to see market-based approaches as a false solution—a doubling down on the logic of market and neoliberalism that many see as the driving force behind global climate change.").

476 The modern Republican Party has cultivated a new core base of active participants by strategically embracing "denialism," which challenges the existence of objective truth and the legitimacy of existing social, economic and political institutions. *See* Dana Milbank, The Destructionists: The Twenty-Five Year Crack-Up of the Republican Party (2022).

477 *See* Phil McManus, Environmental Regulation, International Encyclopedia of Human Geography, (2nd ed. 2020).

478 *See* Robert S. Pindyck, *Uncertainty in Environmental Economics,* 1 Rev. of Env't. Econ. & Pol'y 45 (2007).

instruments or taxes over direct regulation: they offer a higher degree of cost certainty inherent in these policy vehicles, especially in the case of a carbon tax.[479] This allows the entities subject to these levies to plan ahead more effectively, given they know that the cost is governed by the legislated rate of the tax.[480]

Politicians, on the other hand, have traditionally opposed environmental taxes on various grounds, ranging from their characterization as "new" taxes imposed on top of existing taxes,[481] to their tendency to be regressive when applied to carbon sources that heat voters' homes and fuel their automobiles.[482] However, one of the most powerful sources of opposition is low public understanding of how specific taxes work.[483] Public messaging by policymakers about the purposes and benefits of carbon-abatement levies are conspicuously ineffective.[484]

Business interests' attitudes on carbon taxes seem to hinge largely upon whether they are directly affected by them. As we have seen, oil and gas concerns will be immediately impacted under either an upstream carbon tax or a cap-and-trade regime. The system they prefer to live under will depend on several factors, such as the ability to pass the costs of the levy down to their customers.[485] By contrast, the U.S. agricultural sector may take a neutral stance to the Biden-backed methane fee, since it is not applied to many core activities, such as cattle operations.[486] Similarly, firms that are not directly affected by these

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479 Avi-Yonah & Uhlmann, *supra* note 413, at 42.

480 *Id.*

481 A large number of Republican members of Congress have signed the "Norquist Pledge," which essentially places them in opposition to any new federal revenue sources without compensating reductions elsewhere in the tax code. *See* Michael Tomasky, *The Right Wing Zealot Who Wrecked the Budget Process and Made Washington Dysfunctional,* The New Republic (March 13, 2023), https://newrepublic.com/article/171101/grover-norquist-pledge-broke-washington [https://perma.cc/A9LW-2UEA].

482 *See* Sumedha Basu, *Why we need the opposite of a carbon tax to reduce emissions,* The Conversation (June 24, 2020), https://theconversation.com/why-we-need-the-opposite-of-a-carbon-tax-to-reduce-emissions-133490 [https://perma.cc/4H3T-E7XC].

483 The authors point to a university survey in which over half of people polled said they had never been a participant in a government program, although over 90% affirmed that they contributed to Social Security and Medicare. *See* Syon Bhanot & Reed Orchinik, *Why We Hate Taxes, and Why Some People Want Us To,* Behav. Scientist (Aug. 5, 2019), https://behavioralscientist.org/why-we-hate-taxes-and-why-some-people-want-us-to/ [https://perma.cc/XT59-ZWVH].

484 Research data show that while the public often identifies the potential environmental benefits of carbon levies, there is widespread belief that their financial burdens are borne by lower-and-middle income people. These attitudes persist even when revenue distribution schemes that would lower other taxes for these populations are presented. *See* Marina Povitkina et al., *Why Are Carbon Taxes Unfair? Disentangling Public Perceptions of Fairness*, 70 Glob. Env't Change (2021).

485 Avi-Yonah & Uhlmann, *supra* note 413, at 46.

486 Muresianu, *supra* note 384.

charges may endorse carbon levy structures if they generate revenues that result in reductions to their corporate tax burdens.[487]

B. Possibilities for Change

The following section discusses several options for policy change. Some, involving modifications to existing vehicles, such as the methane fee, are modest in nature. Others are more expansive, incorporating methane into a broader-based carbon tax. Other policy tools, including tax incentives, augment direct regulation and emissions mandates in the arsenal of the climate change battle.

1. Modification of the Methane Fee

As discussed earlier, the methane fee spawned by the Inflation Reduction Act carries the triple structural deficiencies of a narrow base, low rates, and weak thresholds. A fourth issue has emerged in the implementation of the scheme—the self-reporting of methane emissions by the oil and gas firms subject to the fee.[488] Industry underreporting of methane emissions that fall under EPA mandates is estimated to be on the order of 200%.[489] These flaws reflect concessions that Democratic legislators[490] granted to producers to push the measure through Congress, but these same concessions render the fee regime relatively ineffectual.[491]

2. Address the Agriculture Problem

The agricultural sector—specifically that portion involving livestock cultivation—is the leading anthropogenic source of methane in the United States.[492] Expanding the methane fee to include emissions

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487 Using revenue generation to reduce other taxes has been discussed principally in conjunction with carbon taxes, but theoretically could be applied to cap-and-trade structures as well. *See* Michael Wara, *Instrument Choice, Carbon Emissions, and Information,* 4 Mich. J. Env't. & Admin. L. 261, 297 (2015).

488 *See* Robert Hitt, *A Methane Fee Won't Work If It Doesn't Count All The Methane,* The Am. Prospect (Aug. 16, 2022), https://prospect.org/environment/methane-fee-wont-work-if-it-doesnt-count-all-the-methane/ [https://perma.cc/Z4H3-NZY9].

489 *See* Suzanne Schadel et al., *Oil and gas companies are missing significant methane emissions. Here's how to fix that*, Rocky Mountain Inst. (Oct. 19, 2023).

490 H.R. 5376 passed in the Democratic-majority House of Representatives along pure party lines by a 220-207 margin. *See* Inflation Reduction Act of 2022, *supra* note 6.

491 *See* Nico Portuondo, *Why Republicans want to kill the compromise methane fee*, E&E News (Mar. 3, 2023), https://www.eenews.net/articles/why-republicans-want-to-kill-the-compromise-methane-fee/ [https://perma.cc/GG8S-Y3CN].

492 Between production of methane through livestock enteric fermentation, and management of animal manure, agricultural activities produced one-third of the human-caused methane discharges in the U.S. *See Methane Emissions*, Env't Prot. Agency, https://www.epa.gov/ghgemissions/methane-emissions [https://perma.cc/TV26-BVVB].

from cattle—most logically as an upstream head tax—would go a long way towards internalizing the costs of this potent GHG associated with beef production. This could be complemented by tariffs on the large import market of beef into the U.S., mostly in the form of beef trimmings.[493] Alternatively, a downstream "meat tax" could be imposed on meat sales. Feasibility studies in the Netherlands project that a 30% direct levy would result in an estimated 15% decrease in meat consumption and could generate revenue for redistribution to low-income populations or provide subsidies to plant-based foods to promote healthier public eating habits.[494]

Additional measures can be adopted. Approximately 85% of public lands in the Western U.S. are utilized for livestock grazing,[495] most of which are federal lands. Through the BLM and U.S. Forest Service, the U.S. government collects grazing fees from ranchers based on a formula that uses the feeding capacity of the land parcels approved for grazing permits.[496] The fees are very modest. Adding methane charges could easily be tabulated using a similar approach, based on the types of livestock involved and their numbers within the permit area. Revenues from the methane tax can also be utilized to mitigate damage to the landscape directly tied to grazing activity, like loss of native plants, soil compaction, and erosion.[497] This is in addition to the societal costs of the associated methane release, calculated to produce environmental damage equal to 26 times the monetary value of the grazing fees collected by federal agencies.[498]

Manure management is another important component of methane mitigation. A methane component to a broad-based carbon levy system can help steer practices away from storage systems like manure ponds, which are rich sources of methane and nitrous oxide production

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493 The U.S. is not only the world's largest exporter of beef, but also the second-largest importer. Foreign-processed beef accounts for about 10% of domestic consumption. *See Reviewing the Tariff-Rate Quotas for U.S. Beef Imports*, U.S. Dep't. of Agric. (Dec. 1, 2022), https://www.fas.usda.gov/data/reviewing-tariff-rate-quotas-us-beef-imports [https://perma.cc/X9KT-VHRQ].

494 Marlin J. Broeks, et al., *A social cost-benefit analysis of meat taxation and a fruit and vegetables subsidy for a healthy and sustainable food consumption in the Netherlands*, BMC Pub. Health (May 11, 2020), https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-08590-z [https://perma.cc/NSX5-FQ6P].

495 J. Boone Kauffman, et al., *Livestock Use on Public Lands in the Western USA Exacerbates Climate Change: Implications for Climate Mitigation and Adaptation*, 66 Env't Mgmt. 1137 (2022), https://pubmed.ncbi.nlm.nih.gov/35366068/ [https://perma.cc/4UYZ-3QF2].

496 The basic unit of feeding capacity is called an Animal Unit Month (AUM), which is what is calculated to sustain a cow and her calf, one horse, or five sheep or goats for a month. *See Livestock Grazing on Public Lands*, Bureau Land Mgmt., https://www.blm.gov/programs/natural-resources/rangelands-and-grazing/livestock-grazing# [https://perma.cc/232V-UHJZ].

497 Kauffman, et al., *supra* note 495.

498 *Id.*

through microbial conversion.[499] Dry manure techniques such as composting and pasture rotation reduce these GHG discharges because they facilitate soil enrichment.[500] A portion of revenues from a carbon tax can be devoted to subsidize the transition to low-emission manure storage techniques. This could also place the U.S. in a leadership role in this area, since livestock manure accounts for up to 50% of agricultural discharges of methane and nitrous oxide in some countries.[501]

As part of its COP28 climate agenda, the UN called on economically developed nations to reduce their consumption of meat in favor of plant-based foods.[502] Despite this call, beef industry proponents and marketers in large exporting countries like Brazil and the U.S., contrasted against increasing frequency of climate driven droughts, heatwaves, and wildfires in these same countries.[503] These irreconcilable trends highlight the need for urgent action on an international scale to rein in rising levels of agricultural methane, especially emissions attendant to an expanding international beef industry.[504]

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499 *Practices to Reduce Methane Emissions from Livestock Manure Management*, Env't Prot. Agency, https://www.epa.gov/agstar/practices-reduce-methane-emissions-livestock-manure-management [https://perma.cc/L2HL-CY62].

500 *A Climate-Friendly Approach to Managing Manure*, Nat'l Sustainable Agric. Coal. (June 23, 2020), https://sustainableagriculture.net/blog/a-climate-friendly-approach-to-managing-manure/ [https://perma.cc/AHF8-WSEM].

501 Giampiero Grossi, et al., *Livestock and climate change: impact of livestock on climate and mitigation strategies,* 9 Animal Frontiers 69 (2019), https://academic.oup.com/af/article/9/1/69/5173494 [https://perma.cc/5L4G-JFAT]; *see* Dave Chadwick, et al., *Manure management: implications for greenhouse gas emissions*, 166 Animal Feed Sci. & Tech. 514 (2011), https://www.sciencedirect.com/science/article/abs/pii/S0377840111001556 [https://perma.cc/3GNJ-FWRG].

502 At the COP28 convention in Dubai, meat dishes at official dinners were scaled down, but still composed approximately one-third of the main food offerings. *See* Kenny Torrella, *There's less meat at this year's climate talks. But there's plenty of bull*, Vox (Nov. 30, 2023), https://www.vox.com/future-perfect/2023/11/30/23981529/cop28-meat-livestock-dairy-farming-plant-based-united-nations-dubai-uae [https://perma.cc/8N7S-5WYD].

503 Over 26 million acres of Brazil's Amazon rainforests were burned in calendar year 2023. *2023 Amazon Rainforest Fires,* Rainforest Found. U.S. (2023), https://rainforestfoundation.org/engage/brazil-amazon-fires/ [https://perma.cc/RM3M-SYLL]; Wildfires in the U.S. has averaged just over seven million acres of forest over the 10-year period spanning from 2014-23. *See 2023 North American Wildfires*, Cntr. for Disaster Philanthropy (Feb. 22, 2024), https://disasterphilanthropy.org/disasters/2023-north-american-wildfires/#%3A~%3Atext%3DThe%20National%20Interagency%20Fire%20Center%2Cof%206.83%20million%20acres%20burned [https://perma.cc/RC4S-CHLC].

504 Recent research indicates that up to 55% of projected GHG warming this century could be averted if meat demand were reduced to recommended "healthy diet" levels and improved animal feed and production technologies were fully adopted globally. *See* Catherine C. Ivanovich et al., *Future warming from global food consumption*, Nature Climate Change (Mar. 6, 2023), https://www.nature.com/articles/s41558-023-01605-8 [https://perma.cc/4UZQ-QBHF].

Given certain variables in the international marketplace, such as carcass weight[505] and meat quality (the U.S. produces more grain-fed cattle, for instance), a global weighted system of integrated taxes, quotas, and import tariffs should be negotiated. This type of regime has been endorsed in foundational terms of the General Agreement on Tariffs and Trade, which dates back to 1947.[506] These agreements can maximize market fairness and competitiveness while placing prices on methane emissions that produce meaningful abatement reductions. The biggest problem at present is building a network capable of measuring animal methane discharges[507] with the accuracy required to form the other contours of a workable pricing scheme.

3. Address the Landfill and Wastewater Problems

Methane detection and measurement are major challenges at the nation's landfill[508] and wastewater treatment facilities.[509] The EPA has limited direct authority over the thousands of small capacity landfill sites that fall under local and state supervision.[510] However, larger capacity municipal solid waste fall under EPA's emissions jurisdiction under authority granted under the Resource and Conservation Recovery Act.[511] This enables the agency to exert greater direct influence over such critical aspects of emission control as accurate measurement and methane capture enforcement. However, these powers do not extend

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505 The average carcass weight (per head) of a U.S. beef cattle is over 40% greater than those raised in Brazil. *See* Paul L. Greenwood, *Review: An overview of beef production from pasture and feedlot globally as demand for beef and the need for sustainable practices increase*, 15 Animal 1 (2021), https://www.researchgate.net/publication/353349070_Review_An_overview_of_beef_production_from_pasture_and_feedlot_globally_as_demand_for_beef_and_the_need_for_sustainable_practices_increase [https://perma.cc/QD8F-XRAH].

506 Article II (2) of GATT acknowledges the validity of the imposition of import fees consistent with maintaining market competitiveness with domestic products of the importing nation. *See The General Agreement on Tariffs and Trade (GATT 1947)*, World Trade Org., https://www.wto.org/english/docs_e/legal_e/gatt47_e.htm [https://perma.cc/NN42-T243].

507 Several methods of methane detection for livestock emissions can be employed in varying conditions for measurement, but a major problem is the cost and availability of the most accurate technologies for the task, as well as the lack of industry standards for measurement processes. Dan Blaustein-Rejto & Chris Gambino, *We Can't Manage Cattle Methane Without Better Measurements,* Breakthrough Inst. (May 2, 2023), https://thebreakthrough.org/issues/food-agriculture-environment/we-cant-manage-cattle-methane-without-better-measurements#%3A~%3Atext%3DPresently%2C%20there%20are%20several%20approaches%2Cdirectly%20measuring%20individual%20animal%20emissions [https://perma.cc/UY9C-HQJJ].

508 Winn, *supra* note 71.

509 Poore et al., *supra* note 75.

510 Low-capacity municipal pal solid waste landfills are those with a maximum volume of 2.5 million cubic meters. Code of Federal Regulations, 40 CFR Part 60 Subpart WWW (2015).

511 42 U.S.C. § 6901 et seq. (1976).

to possessing taxing authority or setting fee schedules for emissions discharges.

By contrast, in most of the U.S., wastewater treatment plants are regulated by proxy through a permit system administered by the states.[512] However, methane is not formally classified as a water pollutant since it is a byproduct gas of other biological processes.[513] Therefore, any EPA regulation of methane release in this area would likely be restricted to its presence as an airborne agent, especially in light of recent court decisions (e.g. *Sackett v. EPA)*[514] and the agency's regulatory reach. Given these factors in both the air and water regulatory realms, it will be up to Congress to authorize a levy system to properly establish a price on methane emissions. This could be either as a dedicated methane tax, or as part of a comprehensive carbon regime.

4. Complementary Policy Initiatives and Tax Measures

Direct government supports and indirect tax subsidies targeted to combat climate change are less efficient than a broad-based carbon tax.[515] Opponents' arguments against carbon taxation steer away from economic and efficacy themes and focus on more nebulous political grounds.[516] To be sure, these incentive and subsidy policy approaches have enjoyed successes, such as in aiding the establishment of wind power[517] and solar energy[518] as accepted sources. The Inflation Reduction

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512 The permit system is authorized under provisions of the Clean Water Act and executed under EPA's National Pollutant Discharge Elimination System (NPDES). *See NPDES State Program Authorization Information*, Env't Prot. Agency, https://www.epa.gov/npdes/npdes-state-program-authorization-information [https://perma.cc/BH6C-79SA].

513 In water, various bacterial interactions with carbon compounds produce what is known as "microbial methane." *See Get Informed: Methane,* Know Your H_2O (Updated 2023), https://www.knowyourh2o.com/indoor-6/methane [https://perma.cc/6HMH-26RP].

514 Sackett v. EPA, 598 U.S. 651 (2023), was a case involving the power of the EPA to unilaterally designate a parcel of land being used as a home site as part of protected "wetland" when it didn't fit precisely into a category defined by the U.S. Army Corps of Engineers as "waters of the United States." The Supreme Court ruled that the EPA overstepped its authority since it is not expressly authorized by Congress to render such judgments.

515 The argued advantages of carbon taxation over alternative vehicles are threefold: 1) economic efficiency, manifested in a known price signal to emitters; 2) innovation, which is inspired by firms finding their own ways to respond to the expense of creating carbon discharges in their operations; 3) ease of administration, manifested in the fact that the imposition of the tax is performed though established collection avenues, and doubles as *the* principal policy instrument, unencumbered by complex bureaucratic structures. *See* Shi-Ling Hsu, *Carbon Taxes,* FSU College of L., Paper No. 760 (July 23, 2015), at 4-5.

516 *Id, at 6.*

517 Eric Williams, et al., *Wind power costs expected to decrease due to ecological progress,* 106 Energy Pol'y 427 (2017).

518 California's ten-year incentive program—the Million Solar Roofs Initiative—(California SB-1) provided $3.3 billion in support for small-scale solar electricity generation, which expanded the state's power grid by over 1700 megawatts while driving the price of solar electricity almost in

Act included numerous incentives across a broad front, including credits for residential green energy[519] electric car purchase,[520] and even a credit for use of cleaner aviation fuel.[521] In the organizational arena, the IRA features a "direct pay" provision for tax-exempt entities such as nonprofits and local governments to take advantage of a wide array of clean energy credits.[522] Eligible projects range from electric generation from wind, solar, and battery storage to the purchase of clean vehicles for municipal fleets.[523] The program is structured so that direct IRS payments are issued of a value equal to the appropriate credits.[524]

Incentives of this sort have their place as part of a multi-pronged policy portfolio that includes carbon taxes, targeted fees, and direct regulation.[525] Positive economic incentives have traditionally been employed to encourage desirable behaviors and outcomes.[526] However, other incentives have long been in place to serve pursuits that have exacted heavy social costs. This is particularly the case with regard to

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half over the life of the program. *See* Lindsey Hallock & Michelle Kinman, California's Solar Success Story: How the Million Solar Roofs Initiative Transformed the State's Energy Landscape (2024), https://environmentamerica.org/california/center/resources/californias-solar-success-story/ [https://perma.cc/ST6K-J29N].

519 *See* Press Release, Dep't of Treasury, FACT SHEET: How the Inflation Reduction Act's Tax Incentives Are Ensuring All Americans Benefit from the Growth of the Clean Energy Economy (Oct. 20, 2023), https://home.treasury.gov/news/press-releases/jy1830#:~:text=The%20Inflation%20Reduction%20Act%20will%20also%20provide%20direct%20assistance%20to,will%20reward%20greater%20energy%20efficiency [https://perma.cc/67Y2-R2GW].

520 Credits can be as large as $7500 for purchase of a new plug-in electric vehicle or fuel cell electric that meet new battery component requirements. *See Credits for New Clean Vehicles Purchased in 2023 or After*, Internal Revenue Serv., https://www.irs.gov/credits-deductions/credits-for-new-clean-vehicles-purchased-in-2023-or-after [https://perma.cc/9R6D-QLJY].

521 This provides a credit of $1.25 per gallon for approved fuel mixtures. *See Sustainable aviation fuel credit,* Internal Revenue Serv., https://www.irs.gov/credits-deductions/businesses/sustainable-aviation-fuel-credit [https://perma.cc/6JXU-W3VG].

522 *See* Rachel Chang, *Understanding Direct Pay Transferability for Tax Credits in the Inflation Reduction Act,* Ctr. for Am. Progress, (June 5, 2023), https://www.americanprogress.org/article/understanding-direct-pay-and-transferability-for-tax-credits-in-the-inflation-reduction-act/ [https://perma.cc/HEU7-VK65].

523 *See Direct Pay Through the Inflation Reduction Act*, White House, https://bidenwhitehouse.archives.gov/cleanenergy/directpay/#:~:text=Thanks%20to%20the%20Inflation%20Reduction,building%20qualifying%20clean%20energy%20projects [https://perma.cc/Q6GJ-UVU7].

524 *Id.*

525 Scandinavian countries such as Denmark and Sweden have adopted comprehensive environmental policy regimes utilizing a variety of approaches to specific ecological purposes. *See* Shurtz, *supra* note 388, at 129.

526 *See* Lourdes German & Joseph Parilla, *How tax incentives can power more equitable, inclusive growth*, Brookings Inst. (May 5, 2021), https://www.brookings.edu/articles/how-tax-incentives-can-power-more-equitable-inclusive-growth/ [https://perma.cc/Y2TY-SK8R].

fossil fuels.[527] President Biden's BBB legislation included proposals to eliminate a number of subsidies for gas and oil companies, including immediate expensing of "intangible drilling costs,"[528] the "percentage depletion" deduction,[529] and "tertiary injections."[530] These Biden proposals were major factors why energy company allies in Congress blocked its passage, and withheld approval of its successor bill, the Inflation Reduction Act, unless these subsidies for the gas and oil industry remained.[531] And so they remain.

Another family of ecological measures fall under the category of "environmental taxes."[532] These are mostly older measures that were adopted to target specific harms to the public welfare. At the federal level, these have revolved around excise taxes on hazardous compounds, such as the recently revived Superfund chemical excise taxes.[533] These taxes are specifically earmarked to fund federally sanctioned

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527 U.S. tax subsidies for fossil fuel producers is estimated to have been worth $9.5 billion in 2021. *See* Karin Rives, *Efforts to remove billions in U.S. fossil fuel subsidies face uphill battle,* S&P Glob. (May 17, 2023), https://www.spglobal.com/market-intelligence/en/news-insights/articles/2023/5/efforts-to-remove-billions-in-us-fossil-fuel-subsidies-face-uphill-battle-75649055 [https://perma.cc/85WQ-9NRL].

528 These are expenses incurred not directly related to the final well (*e.g.*, surveys, drill site maintenance, fuel). The Biden proposal would have required firms to spread deductions for these costs over a five-year period. *See* Alex Muresianu & William McBride, *A Guide to the Fossil Fuel Provisions of the Biden Budget,* Tax Found. (Sept. 2, 2021), https://taxfoundation.org/research/all/federal/biden-fossil-fuel-tax/#%3A~%3Atext%3DThe%20two%20tax%20credits%20targeted%2Cthe%20enhanced%20oil%20recovery%20credit.%26text%3DThis%20credit%20allows%20companies%20to%2Cwith%20enhanced%20oil%20recovery%20projects [https://perma.cc/FGV6-BC9J].

529 This provision allows certain independent oil and gas producers to deduct 15% of gross income to offset costs of developing the wells. In many cases, the amount of the deduction far exceeded the costs. The cost of the subsidy is estimated at over $9 billion over ten years. *See* Alleen Brown, *Sen. Joe Manchin Has Been Fighting to Keep Billions in Subsidies for Fossil Fuel Industry,* The Intercept (Oct. 22, 2021), https://theintercept.com/2021/10/22/manchin-climate-fossil-fuel-subsidies-reconciliation/ [https://perma.cc/MA2W-HMFV].

530 Tertiary injection is a technique to extract hard-to-reach oil reserves embedded in rock formation. Well operators inject gases and chemicals to increase pressure in the well or increase the fluid properties of the oil, inducing it to flow to the well head. The deduction allows well operators to deduct the costs associated with these injections immediately, even though the increased oil flows (and income streams) may continue for years afterwards. *See It is Time to Phase Out 9 Unnecessary Oil and Gas Tax Breaks,* Ctr. for Am. Progress (May 26, 2016), https://www.americanprogress.org/article/it-is-time-to-phase-out-9-unnecessary-oil-and-gas-tax-breaks/ [https://perma.cc/FS3K-SLD4].

531 Brown, *supra* note 530.

532 Milne, *supra* note 10.

533 This was passed as part of President Joe Biden's Infrastructure Investment and Jobs Act in 2021. The tax covers 42 hazardous chemical substances used principally in industrial applications, the proceeds of which are used to fund seriously contaminated land parcels in the U.S. *See* Shawn O'Brien et al., *Superfund Chemical Excise Taxes: Once Again, Back to Run the Show*, Bloomberg L. (Mar. 10, 2022), https://news.bloombergtax.com/tax-insights-and-commentary/superfund-chemical-excise-taxes-once-again-back-to-run-the-show[https://perma.cc/NED6-YDY9].

environmental cleanup efforts on contaminated landscapes, as mandated under 1980 congressional legislation.[534] Other examples are aimed at industrial chemicals known to deplete the atmosphere's ozone layer[535] and a levy on new passenger vehicles that do not meet minimum fuel-efficiency standards, the so-called "Gas Guzzler Tax."[536]

Widely varying structures of these regimes have yielded equally divergent effectiveness outcomes. In the case of the taxes on Ozone-Depleting Chemicals, the track record has been generally positive. Its base is broad with no major omissions and with rates fixed in accord with international hazard ratings.[537] The tax is imposed upstream on manufacturers and importers at the point-of-sale, which helps on both the collections and simplicity fronts.[538]As for efficacy, the proof is in the pudding. A recent United Nations assessment of observational data concludes that the ozone layer is recovering and is on schedule to recover to its 1980 dimensions by approximately 2066.[539]

On the other hand, the Gas Guzzler Tax applies only to new passenger cars, and exempts commercial vehicles as well as three of the biggest-selling categories on the nation's highways: pickup trucks, minivans and Sport Utility Vehicles.[540] Neither the rates, the threshold fuel standard, nor the vehicle categories have been updated since 1991.[541] Moreover, in a country with over 280 million registered vehicles on the highways,[542] the tax generates revenues of less than $50 million.[543] On measures of base, effective threshold level, rate structure, and revenue stream, the Gas Guzzler Tax can be judged to be a sputtering policy jalopy.

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534 *See generally* Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601-9675 (2018).

535 26 U.S.C. § 4681 (2018).

536 *See* Energy Tax Act of 1978, Pub. L. No. 95-618, 92 Stat. 3174 (1978).

537 *See The Montreal Protocol on Substances That Deplete the Ozone Later,* U.N. Env't Programme, https://ozone.unep.org/treaties/montreal-protocol/montreal-protocol-substances-deplete-ozone-layer [https://perma.cc/9UUP-48FU].

538 Milne, *supra* note 10, at 429.

539 *See* U.N. Env't Programme, Scientific Assessment of Ozone Depletion: 2022: Executive Summary (Oct. 2022), https://ozone.unep.org/system/files/documents/Scientific-Assessment-of-Ozone-Depletion-2022-Executive-Summary.pdf [https://perma.cc/7YBS-MVB6].

540 *See* Russ Heaps, *Gas Guzzler Tax: What You Need to Know,* Kelly Blue Book (Apr. 4, 2023), https://www.kbb.com/car-advice/gas-guzzler-tax/ [https://perma.cc/F2LR-DGPT].

541 *See id.*

542 *Number of motor vehicles registered in the united states from 1990 to 2022,* Statista (Jan. 12, 2024), https://www.statista.com/statistics/183505/number-of-vehicles-in-the-united-states-since-1990/ [https://perma.cc/EPB2-2WKF].

543 In 2019, total revenues collected from the Gas Guzzler Tax were only $43 million. *See* James Chen, *Gas Guzzler Tax,* Investopedia (June 28, 2022), https://www.investopedia.com/terms/g/gasguzzlertax.asp [https://perma.cc/M7KC-VWLD].

These examples illustrate a defining feature of U.S. environmental policy—one of self-contradiction. Perhaps the best current example of this is the portion of the Inflation Reduction Act that devotes $12 billions of government funds to the promotion of carbon capture and storage ("CCS") systems for the energy, heavy industry, oil, and gas sectors.[544] This family of carbon-neutralizing technologies also includes direct air capture[545] and carbon conversion.[546] These government initiatives are combined with enhanced federal tax credits available under Section 45Q of the Internal Revenue Code.[547] The most enthusiastic boosters for these provisions of the IRA are—ironically—oil and gas companies.[548] Fossil fuel concerns are eager to develop CCS technologies as a means of capturing carbon dioxide in their extraction processes and bury them deep in the earth in compatible rock and mineral formations.[549] While many policymakers and business leaders see CCS as a possible tool to "buy time" in the slow conversion from carbon-fueled economic sectors to clean processes,[550] the oil and gas consortium sees this subsidized process as a means to prolong the time horizons for their extractive activities.[551] As two former operators of a CCS start-up observe: "Since nearly all carbon dioxide injections subsidized by 45Q

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544 *See* Nicholas Kusnetz, *Carbon Capture Takes Center Stage, But Is Its Promise an Illusion?*, Inside Climate News (March 9, 2022), https://insideclimatenews.org/news/09032022/carbon-capture-and-storage-fossil-fuels-climate-change/ [https://perma.cc/4XDH-QD8M].

545 Direct air capture extracts CO_2 from the atmosphere. It can be utilized in industrial operations but can theoretically be used anywhere. It is early in its development, with only 27 facilities in operation worldwide in 2023, and its practical widespread application is questioned because of the relatively low percentage of atmospheric CO_2. *See Direct Air Capture*, Int'l. Energy Agency (2012), https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage/direct-air-capture [https://perma.cc/KFE2-SYVH].

546 Carbon conversion utilizes technologies that integrate captured carbon oxides into a variety of new materials for use in chemical, biological and manufacturing applications. *See Carbon Conversion,* U.S. Dep't. of Energy, https://www.energy.gov/fecm/carbon-conversion [https://perma.cc/E4BU-PAME].

547 Credit for Carbon Oxide Sequestration, 26 U.S.C.§ 45Q.

548 *See* Charles Harvey & Kurt House, *Every Dollar Spent on This Climate Technology is a Waste,* N.Y. Times (Aug. 16, 2022), https://www.nytimes.com/2022/08/16/opinion/climate-inflation-reduction-act.html [https://perma.cc/7XQD-D3DP].

549 Kusnetz, *supra* note 544.

550 There is considerable doubt about the scale on which CCS technology can operate. Given the state of current carbon capture capability, the most optimistic estimates calculate that at best 250 million metric tons (CO_2-eq) per year could be sequestered in the earth by 2035. The U.S. emitted 6 *billion* metric tons (CO_2-eq) in 2020. The IPCC also cautioned that there may not be enough suitable rock formations on a regional basis to sequester enough CO_2 to keep atmospheric GHG levels below the 2050 goal that would limit temperature rise to 1.5-degrees (Celsius). *See* Intergovernmental Panel on Climate Change, *supra* note 19, at 28.

551 Kusnetz, *supra* note 544.

are for enhanced oil recovery, the 45Q program is actually an oil production subsidy."[552]

This is a showcase example of disjointed policies that simultaneously promote the worthy goals of developing a cleaner, sustainable economy while subsidizing the fossil fuel interests that resist this conversion and endanger the mission. However, such displays of initiatives that work at cross-purposes seem to define prevailing aspects of environmental, economic, and social policies, not just in the U.S., but also around the globe.

Conclusion

Examination of the attitudes of policymakers and business interests to the growing threat posed by a potent greenhouse gas— methane— reveals much. First, a reluctance exists to acknowledge the gravity of the situation at hand. In the U.S., the refusal by both the federal administration and Congress to adequately address a danger in ready evidence demonstrates a vacuum in leadership that must be claimed elsewhere. We have seen, through ongoing examples at the sub-national scale, that integrated market-oriented approaches to the carbon crisis are, at core, exercises in communitarian practice and good government. These limited successes must be expanded to broader dimensions, covering the breadth of the GHG spectrum, and across the nation. A comprehensive carbon tax is a first choice on the bases of efficiency, administrability, and efficacy due to its potential for redistributive fairness.

The gravity of the situation calls for decisive action. This requires bringing new voices to the fore. This may finally be occurring. As we have seen at COP28, representatives of the developing world—which bears much of the worst consequences of the climate calamity—are getting more seats at the negotiating table. Captains of commerce have also recognized that the enterprises that provide work and wealth for the world need a stable environment in which to operate at the most basic levels. Joining in the climate fight is also good business.

This is the opportunity for leaders of the developed world, which stockpiled much of its wealth at the expense of the rest of the planet, to give something back. This is a test not only of survival, but a test of leadership in recognition that a sense of global community is now a requisite *for* survival. The task is formidable. President John F. Kennedy,

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552 Through utilization of subsidized CO_2 separation in natural gas extraction, operators can produce a more "pure" methane-rich end product. Injecting the captured CO_2 can, in turn, increase the pressure in the rock capillaries, increasing the flow of gas and oil in the reserve fields. *See* Harvey & House, *supra* note 548.

in his inaugural address, set forth a national mission to send humanity to the moon. That mission carried the message that leadership demands challenge, and is why we must act in this climate crisis, and why, in his words…

> …We [. . .] do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win…[553]

553 *Address at Rice University on the Nation's Space Effort, September 12, 1962,* John F. Kennedy Presidential Libr. & Museum, https://www.jfklibrary.org/archives/other-resources/john-f-kennedy-speeches/rice-university-19620912 [https://perma.cc/M3WX-LHVF].

Giving the Benefit of the Doubt: How Interpretation of the Precautionary Principle May Strengthen Species Protection Under Section 7 the Endangered Species Act

*Anna Aguilar**

Abstract

Maine Lobstermen's Association v. National Marine Fisheries Service (D.C. Cir. 2023) has all but insinuated the end of federal agencies' ability to "give the benefit of the doubt" to imperiled species listed under the Endangered Species Act ("ESA")—for now. In the wake of an ongoing biodiversity crisis fueled by climate change, endangered species continuously depend on agency interpretation to resolve issues in favor of the species, even when faced with scientific uncertainty from lack of data.

Traditionally, it has been understood that the mission of the ESA is to ultimately save the species from extinction, whatever the cost. However, courts have recently taken a skeptical view on agency deference in determining whether agencies may justify using "worst-case scenario" metrics to make agency decisions favoring listed species.

With one less tool in the species protection toolbox, this Note argues that by adjusting the language in the finalized June 2023 rule 88 FR 40753 by the National Oceanic and Atmospheric Administration ("NOAA"), Fisheries may provide a viable outlet to keep the spirit of the precautionary principle alive in formal consultations under the ESA while also coming to terms with agency deference skepticism in the courts.

Table of Contents

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Introduction

On November 28, 2023, Juno became the first mother of the 2024 North Atlantic right whale ("right whale") calving season, welcoming her eighth documented calf.[1] Juno and her calf were first seen off Georgetown, South Carolina—one of several breeding grounds for right whales due to its warm, shallow coastal waters.[2] Celebrations were underway at the National Oceanic and Atmospheric Administration ("NOAA") Fisheries,[3] as each calf is highly valued and considered

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1 *North Atlantic Right Whale Updates*, Nat'l Oceanic & Atmospheric Admin. (Dec. 20, 2024), https://www.fisheries.noaa.gov/national/endangered-species-conservation/north-atlantic-right-whale-updates [https://perma.cc/S3Q9-SX44].

2 *Id. See also Watching for Migrating Right Whales is More Important Than Ever*, Nat'l Oceanic & Atmospheric Admin. (Nov. 23, 2020), https://www.fisheries.noaa.gov/news/watching-migrating-right-whales-more-important-ever [https://perma.cc/NY7N-Z6T4].

3 Also known as the National Marine Fisheries Service (NMFS), the National Oceanic and Atmospheric Administration (NOAA) Fisheries is an office under the Department of Commerce responsible for managing "over 165 endangered and threatened marine species," including the North Atlantic right whale. *See ESA Threatened & Endangered - Species Directory*, Nat'l Oceanic

essential to the survival of this species.[4] Once exploited in commercial whaling around the 1800s for their highly sought-after blubber, the right whale gained its name by being the "right" whale to hunt due to their tendency to float to the surface once they are killed for easy harvesting.[5] Commercial whalers had nearly brought the right whale to extinction by the turn of the 20th century, and despite efforts to revive the species, the whale has "never recovered to pre-whaling numbers."[6] From the once mighty 21,000 individuals at its peak population estimate, current right whale numbers sit around 370 individuals as of 2023.[7]

Notwithstanding celebrations of calf births, the future of the right whale remains bleak.[8] Despite becoming a protected species in 1970[9] under the Endangered Species Act ("ESA"),[10] its population has been slow to grow back.[11] Scientific studies have pointed to increased human-right whale interaction instigated by climate change.[12] In the past decade, warming temperatures in the U.S. Atlantic coast have caused the right whale's prey to markedly shift from their traditional route along the U.S. coast to the comparatively colder Canadian waters,[13]prompting the right whale to change its migration pattern to match.[14]

& Atmospheric Admin. Fisheries, https://www.fisheries.noaa.gov/species-directory/threatened-endangered [https://perma.cc/63UR-MSZ5].

4 *North Atlantic Right Whale Calving Season 2025*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Feb. 7, 2025), https://www.fisheries.noaa.gov/national/endangered-species-conservation/north-atlantic-right-whale-calving-season-2024 [https://perma.cc/NKE9-UNKY].

5 *North Atlantic Right Whale*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Dec. 20, 2024), https://www.fisheries.noaa.gov/species/north-atlantic-right-whale [https://perma.cc/7WR8-NEWR].

6 *Id.* A scientific model estimated pre-whaling numbers for Right whales to be between 9,075-21,32. *See* Sophie Monsarrat et al., *A Spatially Explicit Estimate of the Prewhaling Abundance of the Endangered North Atlantic Right Whale*, 30(4) Conservation Biology 783, 784 (2016).

7 *See North Atlantic Right Whale*, *supra* note 5; *see also New Population Estimate Finds North Atlantic Right Whales Still Swimming Along the Edge of Extinction*, Oceana (Oct. 22, 2024), https://usa.oceana.org/press-releases/new-population-estimate-finds-north-atlantic-right-whales-still-swimming-along-the-edge-of-extinction/ [https://perma.cc/L5KP-52MS].

8 *See generally* Scott D. Kraus et al., *Recent Scientific Publications Cast Doubt on North Atlantic Right Whale Future*, 3 Frontiers Marine Sci. 137 (2016).

9 *See* 35 Fed. Reg. 18319-20 (Dec. 2, 1970). Granting an endangered species protection under the ESA allows NOAA Fisheries to promulgate regulations to prevent species extinction. *See* 16 U.S.C. §§ 1531-1544.

10 The Endangered Species Act (ESA) is administered by both the U.S. Fish & Wildlife Service (manages mainly terrestrial species) and NOAA Fisheries (manages mainly marine species.) *See* 16 U.S.C. §§ 1531-1544. The ESA provides protection to endangered or threatened species and implements conservation plans to keep the listed species off the brink of extinction. *Id.*

11 *North Atlantic Right Whale – Species Status*, Marine Mammal Comm'n, https://www.mmc.gov/priority-topics/species-of-concern/north-atlantic-right-whale [https://perma.cc/WXC9-S6QS].

12 *See generally* Erin L. Meyer-Gutbrod et al., *Redefining North Atlantic Right Whale Habitat-Use Patterns Under Climate Change*, 68 Ass'n for Scis. of Limnology & Oceanography S71 (2023).

13 *North Atlantic Right Whale – Species Status*, Marine Mammal Comm'n, https://www.mmc.gov/priority-topics/species-of-concern/north-atlantic-right-whale [https://perma.cc/WXC9-S6QS].

14 *Id*.

As the right whales deviate from their typical migration pattern,[15] there have been more frequent encounters with fishing vessels, leading to more fatal injuries from fishing gear entanglements and vessel strikes.[16] The exact breakdown of where—(whether in the U.S. or Canada)—the entanglement occurred, or even what type of fishing gear entangled the whale, remains unknown.[17] In fact, getting an accurate number on total whale deaths is virtually impossible as most right whale deaths are also believed to be undocumented, according to NOAA Fisheries.[18]

In 2017, a drastic and sudden decline of more than 20% of the projected total right whale population led NOAA Fisheries to declare an "Unusual Mortality Event" ("UME"),[19] which prompted scientists to further research and investigate the circumstances surrounding the unexpected decrease in the right whale population.[20] A UME is characterized using several factors;[21] most relevant to the right whale being

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15 *Priority Investments for North Atlantic Right Whale Recovery* (Dec. 20, 2024), https://www.fisheries.noaa.gov/endangered-species-conservation/north-atlantic-right-whale-recovery-under-inflation-reduction-act [https://perma.cc/D5GT-RE48].

16 Since 2017, there have been 13 deaths and 3 serious injuries related to vessel strikes; and 9 deaths and 39 serious injuries from fishing gear entanglements. *See* North Atlantic Right Whale Causes of Death for Confirmed Carcasses, Nat'l Oceanic & Atmospheric Admin. Fisheries, https://www.fisheries.noaa.gov/s3/2024-02/North-Atlantic-Right-Whale-Causes-of-Death-for-Confirmed-Carcasses-SI-and-Morbidity-Tables-Combined-16Feb2024.pdf [https://perma.cc/4VKE-HW4A].

17 Maine Lobstermen's Ass'n v. Nat'l Marine Fisheries Serv., 70 F.4th 582, 589 (D.C. Cir. 2023).

18 Richard M. Pace III et al., *Cryptic Mortality of North Atlantic Right Whales*, 3(2) Conservation Sci. & Prac. 1, 6 (2021).

19 As part of the Marine Mammal Protection Act ("MMPA"), and in response to an increasing number of marine mammal mortality events in the late 1980s, Congress formalized a Working Group on Marine Mammal Unusual Mortality Events ("Working Group"). This Working Group is "responsible for investigating possible UME situations and providing a recommendation to NOAA Fisheries or FWS for formally declaring a UME." *See NOAA Fisheries Partners in the Spotlight: The Working Group on Marine Mammal Unusual Mortality Events*, Nat'l Oceanic & Atmospheric Admin., https://www.fisheries.noaa.gov/national/marine-life-distress/noaa-fisheries-partners-spotlight-working-group-marine-mammal-unusual-mortality-events [https://perma.cc/4NHU-T9PT]. *See also* Notice; availability of new criteria for designation of marine mammal Unusual Mortality Events (UMEs), 71 Fed. Reg. 75234, 75235 (Dec. 14, 2006), https://www.govinfo.gov/content/pkg/FR-2006-12-14/pdf/E6-21300.pdf [https://perma.cc/EL4A-BM7E].

20 *2017–2025 North Atlantic Right Whale Unusual Mortality Event*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Jan. 2, 2025), https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2024-north-atlantic-right-whale-unusual-mortality-event [https://perma.cc/KG5T-4DGN].

21 The Working Group utilizes a set of seven criteria to define a UME: 1) a marked increase in the magnitude or a marked change in the nature of morbidity, mortality, or strandings when compared with prior records; 2) a temporal change in morbidity, mortality, or strandings is occurring; 3) a spatial change in morbidity, mortality, or strandings is occurring; 4) the species, age, or sex composition of the affected animals is different than that of animals that are normally affected; 5) affected animals exhibit similar or unusual pathologic findings, behavior patterns, clinical signs, or general physical condition; 6) potentially significant morbidity, mortality, or stranding is observed

the last factor: "morbidity [that] is observed concurrent with or as part of an unexplained continual decline of a marine mammal population, stock, or species."[22] Having little scientific data to work with regarding the circumstances surrounding right whale deaths, NOAA Fisheries concluded—based off "worst case scenario data"[23] from a 2019 study—that "fishing gear used in the lobster and Jonah crab fisheries kills about 46 North Atlantic right whales each decade," and that the fishing industry would need to comply with industry changes such as adjusting fishing net lengths to comport with standards that will not harm right whales.[24]

NOAA Fisheries' stringent new rule prompted the Maine Lobstermen's Association ("MLA") to sue NOAA Fisheries in *Maine Lobstermen's Association v. National Marine Fisheries Service* (D.C. Cir. 2023) ("*Maine Lobstermen's Association*").[25] Specifically, the MLA took issue with NOAA Fisheries choosing to rely on worst-case scenario data offered by a 2019 study to justify its new rule benefiting the right whale instead of using pre-existing data on whale entanglements, which reveals a more conservative number of whale die-offs.[26] NOAA Fisheries; however, felt compelled to narrow fishing industry standards in order to slow down the alarming right whale population decline in recent years.[27] NOAA Fisheries justified using such "pessimistic" data because of the need to "give the benefit of the doubt" to the species[28] in the face of scientific uncertainty.[29] Moreover, NOAA Fisheries argued its position by referencing the legislative history of the ESA, affirming Congress' clear intent to allow agency interpretation in favor of listed

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in species, stocks, or populations that are particularly vulnerable; and 7) morbidity is observed concurrent with or as part of an unexplained continual decline of a marine mammal population, stock, or species. *See Understanding Marine Mammal Unusual Mortality Events*, Nat'l Oceanic & Atmospheric Admin., https://www.fisheries.noaa.gov/insight/understanding-marine-mammal-unusual-mortality-events#what_criteria_define_an_ume? [https://perma.cc/SBA9-PJK7].

22 *See* Pace III et al., *supra* note 18. A UME investigation may "require months, or even years, of data collection, analysis, and interpretation." *See Frequent Questions: 2017-2025 North Atlantic Right Whale Unusual Mortality Event*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Jan 2, 2025), https://www.fisheries.noaa.gov/marine-life-distress/frequent-questions-2017-2024-north-atlantic-right-whale-unusual-mortality [https://perma.cc/K7Y4-5EX5].

23 Faced with unknown data regarding right whale die-offs, NOAA Fisheries set aside data which projected a small amount of whale die-offs due to fish-net entanglements and instead opted to rely on a 2019 study which predicted a drastically higher number of whale-die offs. *See Maine Lobstermen's Ass'n*, 70 F.4th at 589.

24 *Id.*

25 *Id.*

26 *Id.*

27 *Id.*

28 The concept of giving "the benefit of the doubt" to a listed species pertains to NOAA Fisheries' ability to make decisions that favor listed species when faced with scientific uncertainty. *See* Nat'l Rsch. Council, Science and the Endangered Species Act 182-183 (1995).

29 *Maine Lobstermen's Ass'n*, 70 F.4th at 590.

species.[30] The D.C. Circuit Court, however, declared that "[NOAA Fisheries'] legal reasoning was not just wrong; it was egregiously wrong" for "over-emphasizing speculative data" in favor of the right whale and relying on legislative history from the ESA that held no legal weight.[31]

The D.C. Circuit Court ruling, on its face, essentially undermines the ESA's purpose to conserve listed endangered or threatened species and the ecosystem they depend on.[32] By striking down NOAA Fisheries' rule, the court created a potential precedent[33] for other courts to be skeptical in granting agency deference to NOAA Fisheries when issuing regulations that favor the preservation of an endangered species over the interests of the fishing industry, which oftentimes stand diametrically opposed to increased regulation for the sake of species protection and recovery due to increased economic burdens imposed by NOAA Fisheries regulations.

Equally concerning is the publication of a finalized June 2023 rule ("June 2023 rule") from NOAA Fisheries and the U.S. Fish and Wildlife Service ("FWS") that directly contradicts the ESA's ultimate aim at conserving endangered species and further weakens NOAA Fisheries' ability to "give the benefit of the doubt" to listed species under the ESA as a precautionary measure.[34] The June 2023 rule is a revision to previous regulations from 2019,[35] outlining a federal agency's duty under Section 7 of the ESA to ensure that any federal action that may affect the livelihood of endangered listed species must be sure to "*not likely jeopardize* their continued existence" all the while using "the best scientific and commercial data available."[36] For a federal action to *likely jeopardize* a listed species, it must follow a two-prong test listed under 50 C.F.R. § 402.17(a)-(b): the negative *effects of a federal action* must be (1) "reasonably certain to occur" and (2) "would not occur but for

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30 *Id.* at 598.

31 *Id.* at 596, 598.

32 16 U.S.C. § 1531(b).

33 This fear of a potential precedent for agency skepticism was partially realized through the subsequent ruling of *Loper Bright Enterprises v. Raimondo* in 2024. There, the Supreme Court took issue with the presumption that statutory ambiguities would implicate full delegation of interpretive authority to an agency. This decision reined in an agency's ability to make policy decisions when faced with ambiguities in their statutory duty. *See* Loper Bright Enters. v. Raimondo, 603 U.S. 369 (2024).

34 Endangered and Threatened Wildlife and Plants; Revision of Regulations for Interagency Cooperation, 88 Fed. Reg. 40753-55 (June 22, 2023) (to be codified at 48 C.F.R. pt. 402).

35 The final 2019 rule added a two-part test to determine whether the "effects of the action" from an agency action would "likely jeopardize the continued existence of the listed species." *See* Regulations for Interagency Cooperation, 84 Fed. Reg. 44976-81 (Aug. 27, 2019). To have a positive finding, the effects of an agency action is caused by an agency action if 1) it would not occur but for the proposed action, and 2) it is reasonably certain to occur. *Id.*

36 *Maine Lobstermen's Ass'n*, 70 F.4th at 595.

the proposed action."[37] The June 2023 rule seeks to maintain this two-pronged test while removing a list of factors under 50 C.F.R. § 402.17(a)(1)-(3) used to clarify what kind of activities caused by a federal action are *reasonably certain to occur*.[38]

The retention of the "reasonably certain" standard from the two-prong test may initially appear as a benefit to NOAA Fisheries by necessitating the use of concrete data to avoid speculation in its decision making, but it ultimately hurts listed endangered species under the ESA. Much like the right whale, an endangered species may be data deficient, meaning there is a lack of concrete, scientific data that may bar NOAA Fisheries from issuing a finding in favor of the species.[39] Therefore, in order to fulfill the purpose of the ESA by giving species "the benefit of the doubt" as a precautionary measure to prevent extinction, it is imperative that NOAA Fisheries amend their June 2023 rule by severing the need for a two-part test under 50 C.F.R. § 402.17(a)-(b) to determine whether the "effects of a federal action will likely jeopardize" the existence of a listed species under Section 7 of the ESA. More specifically to this Note, removing the requirement for NOAA Fisheries to prove whether the effects of a federal agency action are "reasonably certain to occur" would cut off the impossible task of proving a level of likely certainty in its decision making when faced with deficient data.

Part I of this Note will introduce the ongoing challenge of biodiversity loss in the United States, where it is happening, specify the causes, how much has been lost, and what the Biden administration has done to address the issue. Part II will go over the legislative history that gave rise to the ESA, exploring its purpose and legal framework for formal consultations, with special attention given to formal consultations made in the light of deficient data. Part III will explain how courts have wrestled with granting agency deference towards the administrators of the ESA: FWS and NOAA Fisheries. Part IV will analyze *Maine Lobstermen's Association*, which is the most recent case to deny agency deference to NOAA Fisheries in response to regulations meant to protect the North Atlantic right whale. This section will discuss the precedential implications that this case might set considering the finalized June 2023 rule to amend Section 7 consultation requirements. Finally, Part V suggests amending the June 2023 rule to remove the need of a two-prong test in order to bridge the gap between the *Maine Lobstermen's Association* ruling and the agency's flexibility to issue decisions benefiting endangered species protection despite insufficient data.

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37 Endangered and Threatened Wildlife and Plants; Revision of Regulations for Interagency Cooperation, *supra* note 34.

38 *Id.*

39 *Id.* NOAA Fisheries routinely have to make decisions regarding listed species like the right whale who have very limited scientific data available to make reasonably certain determinations.

I. Climate Change Threatens Biodiversity

We are currently living through a biodiversity crisis.[40] According to the Living Planet Index, there has been a documented 73% decline in global wildlife populations of the observed 34,836 populations of 5,495 species between 1970 to 2020.[41] Specifically in the United States, "34% of plant species and 40% of animal species in the United States are at risk of extinction."[42]Among other factors, climate change has proven to be an increasing threat to animal species and a leading cause of global biodiversity loss.[43]

A. Climate Change Affecting Ocean Temperature and Global Biodiversity Loss

In 2022, the United States released over 6,341.2 million metric tons of greenhouse gas emissions into the atmosphere.[44] Greenhouse gas emissions are the result of gases trapping heat in the atmosphere,[45] and is a leading cause of climate change.[46] Anthropocentric activities in the transportation and agricultural industry have increased the level of heat-trapping greenhouse gases present in the atmosphere and, as a result, have altered temperature patterns on Earth such that temperatures in the ocean and atmosphere have been trending warmer than usual.[47]

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40 World Wildlife Fund, Living Planet Report 2022 14 (2022). *See also* Patrick Greenfield, *The Biodiversity Crisis in Numbers - A Visual Guide*, The Guardian (Dec. 6, 2022), https://www.theguardian.com/environment/2022/dec/06/the-biodiversity-crisis-in-numbers-a-visual-guide-aoe [https://perma.cc/M84M-PR3M].

41 For specific data points, *see Living Planet Index ("LPI")*, World Wildlife Fund (2020), https://www.livingplanetindex.org/latest_results#/ [https://perma.cc/5JUX-5SNY]. LPI is a regularly updated database which measures "the state of the world's biological diversity based on population trends of vertebrate species from terrestrial, freshwater and marine habitats." *Id.* It has been widely adopted by various institutions– most notably used in the Convention on Biological Diversity ("CBD") "as an indicator of progress towards its 2011-2020 targets" and has been recently used in their latest COP15 conference. *Id.*

42 Nature Serve, Biodiversity in Focus: United States Edition 8 (2023).

43 intergovernmental Sci.-Pol'y Platform on Biodiversity & Ecosystem Servs., The Global Assessment on Biodiversity and Ecosystem Services 16 (2019).

44 Env't Prot. Agency, Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks (2024).

45 *Overview of Greenhouse Gases*, Env't Prot. Agency, https://www.epa.gov/ghgemissions/overview-greenhouse-gases [https://perma.cc/7U2V-F3UJ]. The most prevalent greenhouse gas being emitted in the United States is carbon dioxide, consisting of 79.7% of all emissions, followed by methane, and nitrous oxide. *Id.*

46 *What Is Climate Change?*, Nat'l Aeronautics & Space Admin., https://climate.nasa.gov/what-is-climate-change/ [https://perma.cc/FRK5-AGP3].

47 *What is Climate Change?*, U.N., https://www.un.org/en/climatechange/what-is-climate-change [https://perma.cc/F5G8-E8JL]; *What is Climate Change?*, Nat'l Aeronautics and Space Admin., https://science.nasa.gov/climate-change/causes/ [https://perma.cc/FRK5-AGP3].

Oceans play a critical role as a climate change indicator by signaling trends in sea surface temperature.[48] Oceans are known as *carbon sinks*, as heat trapped by greenhouse gasses are efficiently absorbed by oceans, thus increasing ocean temperatures worldwide.[49] Heightened ocean temperatures affect most necessary functions of different animal species, including altering feeding times to avoid sudden temperature changes,[50] decreased genetic diversity among populations "due to directional selection and rapid migration,"[51] and fluctuation in population numbers due to "prey availability, [and] habitat loss."[52]

B. Federal Response to Climate Change

To prepare the United States for climate change adaptation, the Biden administration declared through Executive Order 14008 ("EO 14008") that the world faces a "profound climate crisis" and that it is imperative for federal agencies to take the initiative to begin adapting their policies to consider climate change effects.[53] One such policy recommendation called for dramatic and creative solutions to manage biodiversity loss[54] by updating federal agency policies to take into consideration the effects of climate change,[55] encouraging investment in "nature–based solutions" through infrastructure projects,[56] and prioritizing "research, innovation, knowledge and adaptive learning" to make up for any deficiencies in data regarding the implementation of projects with "nature–based solutions."[57]

To meet the goals of EO 14008, the Department of the Interior ("DOI"), through its sub-agency the U.S. Fish & Wildlife Service,

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48 *Climate Change Indicators: Oceans*, Env't Prot. Agency, https://www.epa.gov/climate-indicators/oceans [https://perma.cc/7H25-Y4DE].

49 *Id. See also The Ocean – The World's Greatest Ally Against Climate Change,* U.N.*, https://www.un.org/en/climatechange/science/climate-issues/ocean.*

50 Sarah R. Weiskopf et al., *Climate change Effects on Biodiversity, Ecosystems, Ecosystem Services, and Natural Resource Management in the United States*, 733 Sci. Total Env't. 2 (2020).

51 Céline Bellard et al., *Impacts of Climate Change on the Future of Biodiversity*, 15 Ecology Letters 365 (2012).

52 *Effects of Climate Change on Marine Mammal Distribution*, Marine Mammal Comm'n (Aug. 2022), https://www.mmc.gov/wp-content/uploads/Climate-Change-Distribution-Shift-Fact-sheet-2.1.23.pdf [https://perma.cc/HY2H-J4KH].

53 Tackling the Climate Crisis at Home and Abroad, Exec. Order No. 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

54 *Highlighting U.S. Efforts to Combat the Biodiversity Crisis*, U.S. Dep't of State, https://2021-2025.state.gov/highlighting-u-s-efforts-to-combat-the-biodiversity-crisis/ [https://perma.cc/SQC4-RVM3].

55 White House Council on Env't Quality, Opportunities To Accelerate Nature-Based Solutions: A Roadmap For Climate Progress, Thriving Nature, Equity, & Prosperity 19 (2022).

56 *Id.* at 22.

57 *Id.* at 33.

overhauled several of its internal policies.[58] The then Secretary of the Interior, Deb Haaland, noted that "climate change . . . pose[s] an ever–increasing threat to native biodiversity. The time to act . . . is now . . . The growing extinction crisis highlights the importance of the Endangered Species Act and efforts to conserve species before declines become irreversible."[59] The DOI further acted on EO 14008 by creating an initiative titled "America the Beautiful," in partnership with other federal agencies, to restore the habitat of species impacted by climate change, among other initiatives.[60]

The Department of Commerce, which handles ESA protection for most marine species under its sub-agency NOAA Fisheries, has also joined the revitalization effort to help imperiled species affected by climate change by capitalizing on the gained funds from the Inflation Reduction Act.[61] The Inflation Reduction Act allocated $2.6 billion dollars to NOAA for Climate-Ready Coasts and Communities, which includes habitat restoration, tribal fish hatcheries, and ecosystems and fisheries initiatives.[62] Notably, $82 million was specifically allocated for the protection of the right whale, broken down into five categories including (1) $35.8 million to monitoring and modeling of the right whale, (2) $20.1 million towards vessel strike reduction, (3) $17.9 million towards "on-demand fishing" using ropeless gear, (4) $5 million towards enforcement, and (5) $3.2 million towards general support.[63]

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58 *Department of the Interior Proposes Expanding Conservation Technique as Climate Change Threatens Greater Species Extinction*, U.S. Dep't Interior, https://www.doi.gov/pressreleases/department-interior-proposes-expanding-conservation-technique-climate-change-threatens [https://perma.cc/ZCG6-F6JY].

59 *Id.* One such regulation change implemented has been a revisal of an ESA section 10(j) rule that allows "the introduction of listed species to suitable habitats outside of their historical ranges" in light of climate change which has effectively forced species displacement due to "habitat unsuitability" which displaces the species and forcibly ousts them from their normal habitat range. *See* Endangered and Threatened Wildlife and Plants; Designation of Experimental Populations, 87 Fed. Reg. 34625 (June 7, 2022).

60 *America the Beautiful*, U.S. Dep't Interior (2024), https://www.doi.gov/media/document/america-beautiful-2024-report [https://perma.cc/Z4BR-Y3JX].

61 *Inflation Reduction Act*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Feb. 28, 2025), https://www.noaa.gov/inflation-reduction-act [https://perma.cc/XVR3-832L].

62 *Inflation Reduction Act*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Feb. 28, 2025), https://www.noaa.gov/inflation-reduction-act [https://perma.cc/XVR3-832L]; *Climate Change Efforts Forge Ahead Thanks to the Inflation Reduction Act*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Feb. 22, 2024), https://www.fisheries.noaa.gov/feature-story/climate-change-efforts-forge-ahead-thanks-inflation-reduction-act [https://perma.cc/UZP7-GQ4J].

63 *See Priority Investments for North Atlantic Right Whale Recovery*, Nat'l Oceanic & Atmospheric Admin. Fisheries (Dec. 20, 2024), https://www.fisheries.noaa.gov/endangered-species-conservation/north-atlantic-right-whale-recovery-under-inflation-reduction-act [https://perma.cc/D5GT-RE48].

In addition to federal agency action, the Senate also introduced a bill in 2021 titled "Recovering America's Wildlife Act of 2022."[64] This bill provides for "financial and technical assistance to states, territories, and the District of Columbia for the purposes of (1) recovering species listed as a threatened or endangered species under the Endangered Species Act or under state law, or (2) avoiding the need to list species under such laws."[65]

While these agency actions and congressional proposals are promising efforts to protect endangered species, they are not nearly as impactful as the authorities created through the Endangered Species Act–arguably the oldest and most powerful tool to protect listed species from going extinct and diverting a biodiversity loss crisis. In the following section, this Note will discuss the purpose of the Endangered Species Act, its existing framework, and the formal consultation requirements to determine whether an agency action will likely jeopardize the existence of a listed species.

II. Overview of the Endangered Species Act

A. Purpose of the ESA

The Endangered Species Act ("ESA") is the cornerstone of wildlife protection in the United States for imperiled species.[66] Having passed with bipartisan support on December 28, 1973,[67] the ESA's purpose is to implement federal protections for vulnerable animals at-risk of extinction.[68] The ESA's purpose exemplified the developing concern over the depletion of animal species to unviable numbers as a "consequence of economic growth and development untempered by adequate concern and conservation."[69]

The overarching goal of the ESA, is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend on may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions."[70] This passive language demonstrates that, while the aim

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64 Recovering America's Wildlife Act of 2022, S. 2372, 117th Cong. (2021), https://www.congress.gov/bill/117th-congress/senate-bill/2372/text [https://perma.cc/W5DJ-3ESD].

65 *Id.*

66 *See* Tenn. Valley Auth. v. Hill, 437 U.S. 153, 153-54 (1978) (A landmark case where the Court, using the ESA's legislative history, ruled that Congress intended the ESA to reverse the trend toward species extinction—"whatever the cost"); *see also* 16 U.S.C. § 1531.

67 *The US Endangered Species Act*, World Wildlife Fund, https://www.worldwildlife.org/pages/the-us-endangered-species-act [https://perma.cc/H5U9-MPTX].

68 16 U.S.C. § 1531.

69 *Id.*

70 16 U.S.C. § 1531(b).

of the ESA is to save species from extinction, the protections offered by the ESA are an apathetic reaction whereby federal protections for a species by listing it under the ESA[71] only kicks in once the species is already at-risk for extinction, thus operating like an "emergency room" of sorts where the animal becomes "treatable" only when it's on the brink of disappearing entirely.[72]

Similarly, the ESA's delayed reaction in granting federal protection to an imperiled species pursuant to Section 4 is akin to another major flaw of the ESA pertinent to this Note within Section 7: a lack of sufficient scientific data regarding whether a federal action will *likely jeopardize* the continued existence of a species may eventually result in the ultimate demise of the species through the cumulative effects of multiple "no jeopardy" findings.[73] While U.S. environmental law may be primarily "reactive," triggering when something adverse has occurred,[74] other countries have adopted the "precautionary principle" instead; choosing to act as a preventative measure–even if it is with scientific uncertainty–before the problem spirals out of control.[75] In fact, within

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71 The listing process for species begins with a proposal from either the Services or an "interested person" to list a species. *See* 16 U.S.C. § 1533(b)(3)(A). Listing must be based on "the best scientific and commercial data available" and cannot consider the economic impact from listing a species. 16 U.S.C. § 1533(b)(2). The Services considers an array of factors to list a species, such as "the present or threatened destruction, modification, or curtailment of [a species'] habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence." 16 U.S.C. § 1533(a)(1). If listed, an animal species will be considered either "endangered," meaning "any species which is in danger of extinction throughout all or a significant portion of its range;" or "threatened," meaning "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532. A threatened species is defined under the ESA as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." *Id.*

72 *See, e.g.*, James Salzman & Barton H. Thompson, Jr., Environmental Law and Policy 294 (5th ed. 2019) ("More importantly, the ESA provides no protection to a species until that species is in serious danger of extinction… Rather than protecting species when they are healthy, the ESA waits until a species is at the brink of extinction.").

73 A no jeopardy finding is issued when, *inter alia*, the effects of a federal action will not jeopardize the continued existence of a listed species. *See generally* Daniel Rohlf & Colin Reynolds, *Restoring the Emergency Room: How to Fix Section 7(a)(2) of the Endangered Species Act*, 52 Env't. L. 685, 707 (2022). This phenomenon has been coined in the environmental law space as a death "of a thousand cuts," where the finishing blow to a species is not attributable to any one individual "no jeopardy" finding, but rather the cumulative effects of multiple no jeopardy findings. *Id.* at 702.

74 *See* David M. Bearden et al., Cong. Research Serv., RL30798, Environmental Laws: Summaries of Major Statutes Administered by the Environmental Protection Agency (2013) (various environmental statutes that "trigger" only when there has been some sort of action done).

75 U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), annex I, principle 15 (Aug. 12, 1992).

the international community, the precautionary principle has been widely adopted as customary international law.[76]

Despite perceived weakness within the language of the statute itself, prioritization for species protection can be found within the ESA's legislative history.[77] In a House Report, Congress came up with the concept that imperiled species should be given "the benefit of the doubt" by the consulting agency (whether that be FWS or NOAA Fisheries) when evaluating whether the effects of an action agency's project will likely jeopardize the continued existence of a listed species.[78] Why then, Congress would ask, would there be a distinction between an endangered species and a threatened species if it wasn't to "regulate these animals before the danger becomes imminent"?[79]

As it stands, the current text of the ESA does not explicitly state that FWS or NOAA Fisheries must take into consideration precautionary measures when confronted with scientific uncertainty on deciding a positive jeopardy finding.[80] Nor have the Services implemented guidance material affirming their stance on utilizing the precautionary principle when issuing regulations.[81] Nonetheless, the courts have traditionally made it clear that giving listed species "the benefit of the doubt" as a precautionary principle should be taken into consideration equally as a general policy matter.[82] Part III of this Note will explore how the precautionary principle has been interpreted by the courts, and Part IV will discuss how the D.C. Circuit has dismantled giving agency deference in utilizing the precautionary principle in agencies' decision making. The following section will discuss the Section 7 consultation process NOAA Fisheries must go through when reviewing the effects of an agency action on a listed species.

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76 *See generally* Owen McIntyre & Thomas Mosedale, *The Precautionary Principle as a Norm of Customary International Law*, 9 Env't L. 221, 229 (1997) (The precautionary principle has been adopted into general international law-making, such in the 1990 Bergen Ministerial Declaration on Sustainable Development in the ECE Region, "[I]n order to achieve development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation," in the 1990 Bangkok Declaration on Environmentally Sound and Sustainable Development in Asia and the Pacific, and has even been incorporated into the 1992 Rio Declaration on Environment and Development as Principle 15 "[i]n order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used for postponing cost-effective measures to prevent environmental degradation."). *Id.*

77 H.R. Rep. No. 96-697, at 12 (1979) (Conf. Rep.), reprinted in 1979 U.S.C.C.A.N. 2572, 2576.

78 *Id.*

79 John Earl Duke, Note, *Giving Species the Benefit of the Doubt*, 83 Bos. U. L. Rev. 209, 218 (2003).

80 *See id.* at 210.

81 *See id.*

82 *Id.*

B. Framework of Consultation

The ESA establishes a set of substantive and procedural provisions whereby federal agencies must review their actions if they have the potential to adversely affect listed species.[83] Holding federal agencies accountable to both rigorous substantive and procedural standards ensures that federal agencies take the time to first consider whether their actions will result in an adverse effect towards a listed species, and also ensures that the manner in which agencies comply does not also affect the listed species.[84] To initiate the consultation process:

> Each Federal agency shall, in consultation with and with the assistance of the Secretary, ensure that any action authorized, funded, or carried out by such agency…is not *likely* to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species… In fulfilling the requirements of this paragraph each agency shall use the *best scientific and commercial data available*.[85]

The federal agency carrying out the project is known as the "action agency" and must consult with either FWS or NOAA Fisheries (frequently mentioned together as "the Services") to determine if a federal project *may* jeopardize a listed species or adversely affect its habitat.[86] To achieve this, an action agency may initially consult with the "Information for Planning and Consultation" ("IpaC") database provided by FWS to map out whether the project area contains any listed species of which the action agency should be aware.[87] If there are no species within the projected area of the action, then the federal agency may proceed with their project.[88] Keeping this in mind, the action agency still has a duty to consult with either of the Services if it finds that there could potentially be a listed species involved in their project.[89] If there is a finding of such listed species, either FWS or NOAA Fisheries will conduct an informal consultation process called a "biological

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83 *See* 16 U.S.C. § 1536(a).

84 *See Tenn. Valley Auth.*, 437 U.S. at 153–54 (citing legislative history of ESA, the Court pointed out that Congress had intended to fortify protections for listed species given the weak enforcement of prior legislation).

85 *Id.* For an illustrative flowchart showing how Section 7 consultations work; *see generally Section 7: Types of Endangered Species Act Consultations in the Greater Atlantic Region*, Nat'l Oceanic & Atmospheric Admin. Fisheries, https://www.fisheries.noaa.gov/insight/section-7-types-endangered-species-act-consultations-greater-atlantic-region#no-effect-determination[https://perma.cc/9KT6-FPYL].

86 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a).

87 *IPaC Information for Planning and Consultation*, U.S. Fish & Wildlife Serv., https://ipac.ecosphere.fws.gov/ [https://perma.cc/RG77-2M6C].

88 *See* 50 C.F.R. § 402.11.

89 *See id.*

assessment" where the Services look for whether the action agency's project will *likely adversely affect* species or critical habitat.[90] If the project is "*not likely* to *adversely affect* species or critical habitat," then the action agency may proceed and formal consultation is not needed.[91] If, however, there is a possibility that the project may be *likely* to *adversely affect* a species or critical habitat, then the Services would proceed with their investigation through a formal consultation process.[92]

C. Formal Consultation Process

Formal consultation involves the Services producing a document called a "biological opinion" ("BiOp"), which would state, using the "best scientific and commercial data possible," whether the proposed federal action is likely to "*jeopardize the continued existence* of a listed species or destroy or adversely modify critical habitat."[93] Note the heightened scrutiny from the informal consultation's "likely to affect species" language to the formal consultation's "jeopardize the continued existence" standard. This Note will focus on how agencies and courts confront the jeopardy standard as it applies to listed species since it is the topic at issue in the 2023 June rule.

Within a BiOp, the Services must include five categories of information to make a determination as outlined in § 402.14(c), including:

> [(1)] A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action… [;]
>
> [(2)] A map or description of all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action (…as defined at § 402.02) [;]
>
> [(3)] Information obtained by or in the possession of the Federal agency and any applicant on the listed species and designated critical habitat in the action area… including available information such as the presence, abundance, density, or periodic occurrence of listed species and the condition and location of the species' habitat, including any critical habitat [;]
>
> [(4)] A description of the *effects of the action* and an analysis of any cumulative effects [; and]…
>
> [(5)] Any other relevant available information on the effects of the proposed action on listed species or designated critical habitat, including any relevant reports such as environmental impact statements and environmental assessments.[94]

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90 50 C.F.R. § 402.12.

91 50 C.F.R. § 402.13.

92 *See* U.S. Fish & Wildlife Serv. & Nat'l Marine Fisheries Serv., Endangered Species Consultation Handbook xv (1988) [hereinafter Handbook].

93 50 C.F.R. § 402.14.

94 *See* Handbook, *supra* note 92, xi; 50 C.F.R. § 402.14(c) (emphasis added).

Each category must be determined using the "best scientific and commercial data available."[95] The following subsection will focus on how the fourth point–effects of the action–exemplifies the level of discretion the Services may utilize when issuing a jeopardy opinion, a point brought into focus by the recent 2023 D.C. court case that limited such discretion.

1. Effects of the Action

Since the passage of the ESA in 1973, the interpretation of what constitutes "effects of the action" has not been clarified by Congress or the Services. To clarify any potential confusion over the interpretation on what the *effects of the action* should look like, the Services adopted § 402.17 in a 2019 rule in order to: (1) elaborate what standard the Services should use to measure the *effects of an action* by; and (2) lay out non-exhaustive factors the Services should be considering to determine what effects may possibly affect a listed species.[96] The standard adopted to determine the effects of a federal action takes on the form of a two-prong test within § 402.17(a)-(b): to issue a positive jeopardy finding, the effects of the federal action would have to (1) be reasonably certain to occur; and (2) have not occurred but-for the proposed action.[97] Pertinent to this Note, § 402.17(a) explains effects that are *reasonably certain to occur* must be "based on *clear and substantial information*, using the *best scientific and commercial data available*" in order to find that the federal action may or may not jeopardize the continued existence of a protected species.[98] To issue a no jeopardy finding simply from lack of data has never been part of the Services' policy.[99] Non-exhaustive factors that may be considered in § 402.17(b)(1)-(3) to determine what effects may be reasonably certain to occur are:

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95 50 C.F.R. § 402.14(d).

96 84 Fed. Reg. 44976-7 (Aug. 27, 2019). The Services hoped that offering guidance would "clear the air" and provide a more transparent process when issuing their jeopardy decisions, stating that "the failure to provide a definition and any parameters to the term 'reasonably certain to occur' left the concept vague and occasionally produced determinations that were inconsistent or had the appearance of being too subjective." *Id.*

97 This Note will focus on the latter prong as it heavily relies on using "clear and substantial information, using the best scientific and commercial data available" in order to make the decision on whether the effect will likely jeopardize the continued existence of a species. 50 C.F.R. § 402.17(a)-(b).

98 50 C.F.R. § 402.17(a) (emphasis added).

99 50 C.F.R. § 402.17.

> (1) The consequence is so remote in time from the action under consultation that it is not reasonably certain to occur; or
>
> (2) The consequence is so geographically remote from the immediate area involved in the action that it is not reasonably certain to occur; or
>
> (3) The consequence is only reached through a lengthy causal chain that involves so many steps as to make the consequence not reasonably certain to occur.[100]

Though § 402.17(a) may appear to welcome the Services' subjective interpretation in giving the benefit of the doubt to listed species when confronted with insufficient data, the "reasonably certain to occur" element from the two-prong test requires a degree of scientific certainty to render a positive jeopardy finding.[101] Thus, any possible subjective interpretation by the Services to fill in the gap of insufficient scientific data will still be subject to a strict objective scientific standard.[102] Necessitating a degree of scientific certainty for effects that are "reasonably certain to occur" forces NOAA Fisheries to consider only reasonably certain effects with solid, scientific data to back it up.[103]

What happens to listed species when there is insufficient scientific data? Let us say that NOAA Fisheries is considering whether the effects of a federal action would be "reasonably certain to occur" when using the "best scientific data available"—a positive jeopardy finding would imply that whatever effects that are found to likely jeopardize the continued existence of a species is not just simply a hypothetical "may happen" scenario but *an actually possible,* "reasonably certain" scenario. In other words, by requiring the consideration of possible effects that may "reasonably occur" using "the best scientific data possible," a scientific standard limits NOAA Fisheries from considering scenarios where the data suggest possible likelihoods even if there already exists concrete likelihoods (albeit limited in quantity) in scientific data.[104] The "reasonable certainty" prong goes against the original intent of the ESA to use the precautionary principle (benefit of the doubt) when faced with scientific uncertainty, as it mandates that any gaps in scientific data for a listed species must be resolved in favor of whatever outcome is favored by existing and concrete scientific data—whether that benefits the listed species or not.

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100 *Id*.

101 *See* 50 C.F.R. § 402.17(a).

102 *Id.*

103 *Id.*

104 *See generally* Bearden et al., *supra* note 74, at 217.

The ruling in *Maine Lobstermen's Association* similarly restricted NOAA Fisheries from considering limited data favoring the right whale and labeled NOAA Fisheries' regulations on the lobster industry as arbitrary for not relying on already existent data that did not favor the right whale.[105] Typically, in past cases, courts have endorsed or even mandated the Services to bridge the gap of scientific uncertainty by using both (1) data showcasing worst-case scenario data and (2) the agency's scientific expertise in wildlife protection to create conclusions that a federal action will tend to evoke a high risk to endangered species.[106] *Maine Lobstermen's Association's* decision effectively contradicts past court precedent establishing the importance of considering the precautionary principle in the Services' decision making. The following section will further elaborate on how there has been an established pattern among different circuits that recognize the precautionary principle where there is a deficiency in data when making jeopardy decisions and gives the Services deference in giving species the "benefit of the doubt" and issuing a positive jeopardy decision when there is the presence of a conceivable risk to the listed species.

III. Case Precedent for Biological Opinions

NOAA Fisheries in *Maine Lobstermen's Association* was confronted with limited knowledge surrounding the circumstances behind the right whale deaths.[107] The court in *Maine Lobstermen's Association* found that the way NOAA Fisheries came to the conclusion that the "effects of the action" that "would have likely jeopardized" the right whale was based on "pessimistic outcomes" from data considered to be an "outlier" of sorts, and not actually based in more "rooted reality" given that there were other established data points that had a more conservative number depicting fewer whale deaths from vessel strikes and fishing gear entanglements.[108]

This section will analyze cases primarily from the 9th Circuit that support the idea that when faced with scientific uncertainty, the Services should be able to make a determination that gives the "benefit of the doubt" to the listed species. Part IV will discuss the deviation of this precedent established by the 9th Circuit in *Maine Lobstermen's Association* and the possible implications this deviation might have for the Services moving forward. Part V will then analyze a possible remedy in the form of rulemaking where the Services could amend a June 2023

105 *See infra* Part IV for an in-depth analysis on the court's ruling.

106 *See infra* Part III for a discussion on how courts from different jurisdictions endorse a "precautionary principle" approach in giving species "the benefit of the doubt" when the Services issue decisions.

107 *Maine Lobstermen's Ass'n*, 70 F.4th at 588.

108 *Id.* at 587.

rule to better reflect the precautionary principle and establish how it fits in with the ruling of *Maine Lobstermen's Association.*

A. Case Precedent for Validity of Biological Opinion in the Face of Deficient Data

Tennessee Valley Authority v. Hill (hereinafter "*TVA v. Hill*") was the first case to establish any hint of a precautionary principle within listed species conservation.[109] Congress had authorized the construction of the Tellico Dam, until the discovery of a possibly endangered snail darter fish.[110] It was projected that if the project were to continue, the snail darter's habitat would be completely destroyed.[111] Tennessee residents sued the party responsible for constructing the dam, the Tennessee Valley Authority, and asked the Court for a temporary injunction on the nearly completed dam project until more scientific data on the snail darter was made available.[112] Stuck at the crossroads between permitting the completion of the Tellico Dam or preserving the existence of a small snail darter fish, the Supreme Court made it clear that the Services were to consider the viability of a listed species as a top priority over any economic or political interest.[113] According to the Court, the legislative history of the ESA insinuates that species protection should be treated as a high priority, further saying that "Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities, thereby adopting a policy which it described as 'institutionalized caution.'"[114] In one poignant sentence, the Court stated "the ESA was designed to prevent the loss of any endangered species, *regardless of the cost*."[115] Although *TVA v. Hill* does not directly discuss what becomes of a listed species in the face of deficient scientific data, it sets a high bar for species prioritization by emphasizing species protection over any other external factor—which may arguably include scientific uncertainty. The following cases carry on the legacy of this recognized precautionary principle in species conservation.

1. Conner v. Burford, 848 F.2d 1441, 1454 (9th Cir. 1988)

10 years after the decision in *TVA v. Hill*, the court in *Conner v. Burford* clarified that the Services are not exempt from considering

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109 *Tenn. Valley Auth.*, 437 U.S. at 174.

110 *Id.* at 174-175.

111 *Id.* at 172, 175.

112 *Id.* at 164, 177.

113 *Id.* at 177, 194.

114 *Id.* at 194.

115 *Id.* at 213 n.34 (emphasis added).

certain kinds of activities that may affect a listed species simply because there is a lack of scientific information.[116] The plaintiff was concerned that the U.S. Forest Service's issuance of oil and gas leases would have negative effects on four endangered species.[117] The U.S. Forest Service, after consultation with FWS, decided that any harm done after the lease was sold would not result in any jeopardy to the listed species due to insufficient data and did not warrant going through formal consultation under Section 7 of the ESA.[118] The court, however, maintained that in order to uphold Congress' intent to give the "benefit of the doubt" to species, the Services must proactively seek out the best scientific data available demonstrating the potential effects of a federal project.[119] The Services could not arbitrarily choose to prevent any further scientific query that could render their no-jeopardy finding inaccurate.[120] Simply put, the court found the FWS to be acting arbitrarily in "ignor[ing] available biological information or fail[ing] to develop projections of oil and gas activities which may indicate potential conflicts between development and the preservation of protected species."[121] Moving forward, the Services had to, at the very least, consider possible effects to a species even if there was insufficient scientific data and weigh those findings in equal importance to existing scientific data before rendering a decision.[122] The following case expands upon the duty of the Services to issue decisions regardless of the concreteness of the scientific data presented.

2. *Defenders of Wildlife v. Babbitt, 958 F. Supp. 670, 680 (D.D.C. 1997)*

The quality of data constituting the "best scientific and commercial data available" to make jeopardy determinations was defined by the D.C. District Court in *Defenders of Wildlife v. Babbitt*, where it outlined that although the ESA does not clearly define what exactly "best available data" should look like when listing a species as endangered, it should not prevent the Services from moving forward with a decision simply because the scientific evidence is not solid or "conclusive."[123] The conservation organization Defenders of Wildlife sued the FWS when

116 Conner v. Burford, 848 F.2d 1441, 1454 (9th Cir. 1988).

117 The four endangered species in question were the grizzly bear, peregrine falcon, the gray wolf, and the bald eagle. *Id.* at 1452.

118 *Id.* at 1444, 1452.

119 *Id.* at 1454.

120 *Id.*

121 *Id.*

122 *Id.*

123 Defenders of Wildlife v. Babbitt, 958 F. Supp. 670, 679–80 (D.D.C. 1997).

the agency decided not to list the Canada Lynx as endangered because the scientific data available was incomplete.[124] The court remarked:

> The statutory standard, requiring that agency decisions be made on the "best scientific and commercial data available", rather than absolute scientific certainty, is in keeping with congressional intent in crafting the ESA. Congress repeatedly explained that it intended to require the FWS to take *preventive measures* before a species is "conclusively" headed for extinction. The purpose of creating a separate designation for species which are "threatened", in addition to species which are "endangered", was to try to "regulate these animals before the danger becomes imminent while long-range action is begun."[125]

The court in *Defenders of Wildlife* criticized the FWS decision to postpone listing the Canada Lynx because of the lack of quality of scientific data available.[126] This case demonstrates that the quality of scientific data needed to issue decisions need not be "conclusive" but rather "the best available data available at the time" when issuing decisions, even if the data are incomplete.[127] Courts have also held a reluctance to find that the Services' finding of "no jeopardy" is justified when there are no data to ensure that there is no jeopardy against a listed species, as exemplified in the following case.

3. *Klamath-Siskiyou Wildlands Ctr. v. Nat'l Oceanic & Atmospheric Admin., 99 F. Supp. 3d 1033, 1059 (N.D. Cal. 2015)*

A lack of best scientific data available does not give the Services the ability to automatically assume that the effects of a federal action are not likely to jeopardize the continued existence of a listed species.[128] Reiterating the ESA's Section 7 duty for the Services to "ensure that its actions are not likely to jeopardize the continued existence of the listed fish or result in destruction or adverse modification of critical habitat," the District Court echoes the precautionary principle in saying that "[i]f [NOAA Fisheries] does not have the information to satisfy this duty [to ensure against jeopardy or adverse modification], then it simply cannot issue a finding of no jeopardy."[129] This ruling establishes that a decision made in favor of a species despite lack of best scientific data does not automatically insinuate that the Services is adopting a pessimistic view without any basis, but is instead following in the spirit of the

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124 *Id.* at 681.

125 *Id.* at 679–80 (first emphasis added) (citation omitted).

126 *See id.* at 680.

127 *Id.* at 681.

128 Klamath-Siskiyou Wildlands Ctr. v. Nat'l Oceanic & Atmospheric Admin., 99 F. Supp. 3d 1033, 1059 (N.D. Cal. 2015).

129 *Id.*

ESA to automatically render decisions in favor of the species before there is serious concern for extinction.

It needs to be reiterated that while the precautionary principle of giving the benefit of the doubt to species is not explicitly enshrined within the plain language of the ESA, years of court precedent have highlighted time and time again that in keeping with the spirit of the ESA to prevent the extinction of species, decisions made by the Services must be made in favor of the species who have everything to lose without federal protection.[130] As stated in previous sections of this Note, the current biodiversity crisis has exacerbated the rate at which species in the United States and across the world have gone extinct, never able to be brought back.[131] In this sense, the Services have a duty to utilize the ESA as a conservation tool and preserve listed species before their numbers dwindle down to an alarming level, as is the case with the right whale. The next part will analyze the reasoning behind the D.C. District Court's circuit split from the widely adopted precautionary principle, and the implications it carries in light of the June 2023 rule.

IV. Maine Lobstermen's Association V. National Marine Fisheries Service

Amidst the sudden tragedy of the 2017 right whale UME, killing 20% of the population in one year, NOAA Fisheries quickly devised a group of scientists to investigate the source cause.[132] NOAA Fisheries had to make sense of a situation with limited data to decipher the what, where, and why of the declining right whale population.[133] Wasting no time, NOAA Fisheries reinitiated formal consultation between its two internal divisions: the Sustainable Fisheries Division and the Protected Resources Division.[134] With the knowledge that the available recorded deaths displayed a high rate of fatal injury from vessel strikes and fish net entanglements, NOAA Fisheries initiated formal consultation requirements under Section 7 of the ESA, which looked at whether the adverse effects towards the right whale from the lobster and crab industries in New England are reasonably certain to occur.[135]

As is the case for countless other listed species–particularly those affected by climate change–scientific data for the right whale is generally lacking due to emergent deviations in normal feeding and migration

130 *See supra* Part III.A(1)-(3).

131 *See supra* Part II.A.

132 *2017–2025 North Atlantic Right Whale Unusual Mortality Event*, Nat'l Oceanic & Atmospheric Admin. Fisheries, https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2024-north-atlantic-right-whale-unusual-mortality-event [https://perma.cc/KG5T-4DGN].

133 *Maine Lobstermen's Ass'n*, 70 F.4th at 590.

134 *Id.*

135 *Id.* at 591.

behavior from increased ocean temperatures.[136] From the scientific data NOAA Fisheries did analyze, however, there were two conflicting interpretations: (1) the approximate number of deaths caused by the lobster and crab industry do not render the negative effects from the industry likely to jeopardize the right whale continued existence; (2) fisheries, through their operations, kill about 46 NARW (North Atlantic right whale) each decade, which would decimate the species in less than 10 years.[137] A "conservation framework"[138] was drawn up by NOAA Fisheries with listed goals it aimed to achieve to reduce right whale deaths.[139] Even with the conservation framework, NOAA Fisheries found itself lacking sufficient data to concretely determine the exact cause of right whale deaths.[140] In fact, according to NOAA Fisheries, most right whale deaths are believed to be undocumented.[141] NOAA Fisheries declared that "the population continues to decline at an unsustainable rate,"[142] and ultimately determined that the latter interpretation of data–where the lobster and crab industry will likely wipe out the right whale population in 10 years–was the reading that would ensure a positive jeopardy finding and allow it to implement stringent guidelines in its fisheries and promise a glimmer of hope to reduce the amount of take for the right whale.[143]

The District Court was unimpressed with NOAA Fisheries' interpretation. The court focused on criticizing the assumptions made by NOAA Fisheries, asking the question of whether NOAA Fisheries "must (or even may) indulge in worst-case scenarios and pick 'pessimistic' values in order to give 'the benefit of the doubt' to the species.'"[144] Ultimately, the court concluded that, while NOAA Fisheries is an agency entitled to deference when it comes to "form[ing] a scientific judgment," as it is composed of a team of expert scientists, the role of NOAA Fisheries is nonetheless "a limited one."[145] The court explained that the role of NOAA Fisheries should be one akin to being an advisor: "[t]he Service must lend expert assistance to the action agency, make a prediction

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136 *Id.*

137 *Id.*

138 For list of initiatives NOAA Fisheries aims to achieve to reduce right whale deaths, *see North Atlantic Right Whale: Conservation & Management*, Nat'l Oceanic & Atmospheric Admin. Fisheries, https://www.fisheries.noaa.gov/species/north-atlantic-right-whale/conservation-management [https://perma.cc/DNV6-YVVB].

139 *Maine Lobstermen's Ass'n*, 70 F.4th at 592.

140 *Id.* at 588.

141 *Id.* at 589.

142 *Frequent Questions: 2017-2025 North Atlantic Right Whale Unusual Mortality Event*, *supra* note 22.

143 *Maine Lobstermen's Ass'n*, 70 F.4th at 589-90.

144 *Id.* at 595.

145 *Id.* at 596.

about effects and, if the agency cannot reject the null hypothesis (no jeopardy) as unlikely, then grant a license."[146]

What the court found to be particularly egregious was the presumption on the part of NOAA Fisheries that they are allowed to decide what scientific data to use when making a jeopardy finding, saying "nothing in [Section] 7 requires 'distorting the decision making process by overemphasizing highly speculative harms' whenever the available data is wanting."[147]

Practically, this means that when presented with data that suggests the effects of an action will not likely jeopardize a listed species, that data should hold deference to any outlying data that might suggest otherwise. A possible confusion of the court was in its analysis of NOAA Fisheries' assumptions based on incomplete data. In naming the pessimistic data NOAA Fisheries used as "speculative," the Court saw NOAA Fisheries' interpretation of the pessimistic data as being arbitrary because it believed that NOAA Fisheries favored the right whale on a whim by choosing to rely on the study that purportedly artificially inflates the possible number of right whale deaths beyond what was found in other studies.[148] However, as court precedent has established, the Services are often confronted with limited data, "so [NOAA Fisheries] are often forced to make assumptions to overcome the limits in our knowledge…We generally select the value that would lead to conclusions of higher, rather than lower, risk to endangered or threatened species . . ."[149] The pessimistic data used by NOAA Fisheries were already in the realm of possible effects that would occur from actions taken by the crab and lobster industry, but the court interpreted NOAA Fisheries' decision to "give the benefit of the doubt" to the right whale as something that is not based in science.[150]

NOAA Fisheries' additionally claimed that it is owed deference from the court when the governing statute—the ESA—is silent on how to handle decisions using insufficient data.[151] NOAA Fisheries relied on House Reports before the formulation of the ESA revealing that the language found within Section 7 of the ESA was meant to be construed in favor of the imperiled species.[152] NOAA's claim was quickly dismissed by the court, since "legislative history is not the law" and cannot supply duties that are not found in the law itself.[153]

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146 *Id.*

147 *Id.*

148 *Id.*

149 *Id.* at 589.

150 *Id.*

151 *Id.* at 596.

152 *Id.* at 590 ("This language continues to give the benefit of the doubt to the species….").

153 *Id.* at 598 (quoting Epic Sys. Corp. v. Lewis, 138 S. Ct. 1612, 1631, 200 L. Ed. 2d 889 (2018)).

As a final note, the court disregarded the attempt from NOAA Fisheries to make decisions by picking "whales over people" as a way to adopt the precautionary principle in favor of the imperiled species.[154] Bringing up the example of other environmental frameworks that explicitly implement the precautionary principle, like the Clean Air Act (where a buffer for chemical exposure for the sake of human health was directly implemented by Congress),[155] here the court found that since Congress did not explicitly grant permission to use such principle to benefit species protection over people, then the agency would be overreaching in its influence.[156] *Maine Lobstermen's Association* might set a bad precedent in justifying dismissal of the ESA's legislative history and disregard for the utilization of the precautionary principle in the Services' decision making, but a 2023 rule by the Services has brought about an opportunity to adjust how the Services assess the standard to be met when evaluating when the effects of a federal action may likely jeopardize the continued existence of a listed species. In the following part, this Note will discuss when "effects of the action" was first changed since the implementation of the ESA in 1973, and what suggestions the Services have in store for the 2023 proposed rule, followed by a proposal to eliminate the need for a two-prong test to evaluate "effects of an action."

V. Proposed Solution to Mend Gap in the "Effects of the Action"

A. 2019 "Effects of the Action" Final Rule

In order to simplify how the Services interpret "effects of an action" under § 402.02, the Services published a final rule in 2019 that added a two-part test to determine whether the "effects of the action" from an agency action would "likely jeopardize the continued existence of the listed species."[157] Before the 2019 regulation, the Services would have looked at several types of action that may jeopardize a listed species, including actions that may have a "direct, "indirect," "interrelated," and "interdependent" effect on a species.[158] The revised 2019 language now directs the Services to determine whether the effects of an agency action jeopardize the continued existence of a species if (1) it would not occur but for the proposed action, and (2) it is reasonably certain to occur.[159] In addition, the Services introduced a whole new section, § 402.17(a)(1)-(3), which would aid in narrowing their

154 *Id.* at 600.

155 *See generally* Bearden et al, *supra* note 74.

156 *Id.*

157 *See* Regulations for Interagency Cooperation, 84 Fed. Reg. 44976-81 (Aug. 27, 2019).

158 *Id.* at 155.

159 *Id.* at 156.

interpretation of effects of an action.[160] While the Services claimed that the implementation of a two-prong test did not necessarily mean a higher burden to meet to find an effect that jeopardizes the continued existence of a species, the fishing industry says otherwise.[161] For lobster and crab industries subject to NOAA Fisheries regulations, this was a welcomed amendment because it outlined how exactly the Services were to measure what constitutes "effects of an action" to determine a jeopardy finding.[162]

The new June 2023 rule carries with it the same issues as the previous 2019 rule—the ultimate problem lies with the Services confusing courts with added definitions to narrowly interpret "effects of the action." The following section analyzes the current 2023 June rule and the weaknesses it perpetuates from the 2019 final rule.

B. 2023 June Rule

The Services deemed the two-prong test to be quite effective in its interpretation of effects of an action.[163] Therefore, they sought to retain this two-part test from the previous 2019 rule in the 2023 rule and additionally recommended the deletion of 50 C.F.R. § 402.17(a)(1)-(3), which contains factors to consider when evaluating when the effects of a federal action towards listed species are "reasonably certain" to occur.[164] The Services stated that later guidance material will be supplied in the "near future" to signal which factors the Service will use to interpret what "reasonably certain" means.[165] In tandem with the 2019 final rule, the Services assured that retaining the two-part test was to "describe a transparent standard that simplified the definition of 'effects of the action,' while still maintaining the scope of the assessment required to ensure a complete analysis of the effects of proposed actions."[166]

As stated previously in Part II(C)(1) of this Note, the retention of a "reasonably certain" standard does nothing to advance the analysis of the effects of a federal action if it is being restricted to just an objective standard using the best scientific evidence available.[167] Like in *Maine Lobstermen Association*, the District Court believed that NOAA

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160 50 C.F.R. § 402.17(a)(1)-(3).

161 84 Fed. Reg. 44976-82.

162 *Id.* at 159.

163 Endangered and Threatened Wildlife and Plants; Revision of Regulations for Interagency Cooperation, 88 Fed. Reg. 40753-55 (June 22, 2023) (to be codified at 48 C.F.R. pt. 402).

164 Applicable factors include: "time distance or multiple steps," "remote in time or location," or "only reached through a lengthy causal chain." *Id.*

165 *Id.*

166 *Id.*

167 *See supra* Part II(C)(1) for an analysis of the shortcomings of the current reasonably certain standard.

Fisheries' interpretation of pessimistic data was arbitrary and capricious because NOAA Fisheries granting the benefit of the doubt to the right whale was seen as too subjective of a decision, and the court insisted that decisions be made strictly on science based data.[168] For the right whale and many other listed species, deficient data require the Services to bridge gaps using their own interpretation of the data, which has been interpreted in favor of the species for many years in other courts.[169] The act of using the precautionary principle—giving the benefit of the doubt to species in light of insufficient data—is impossible to achieve if the Services is restricted to evaluating effects of the action under the question of whether the effects would be reasonably certain to occur. For the right whale, there are limited data on how effects from a federal action will play out, so the automatic answer from the agency would be to not find any jeopardy because there is no data that states otherwise.

C. Remove the Need for a Two-Prong Test to Evaluate Effects of An Action

Under the final June 2023 rule, the Services have added additional barriers of agency interpretation that hurt the viability of the right whale and other listed species in the long run.[170] In focusing on the two-prong test, the issue lies with the second prong: that the "effects of an action" are "reasonably certain" to occur. Despite the Services' assurance that the new test will promote clarity and instill a level of certainty when evaluating scenarios, this Note argues that it is restrictive for the Services to interpret all "effects of an action" that are "likely to jeopardize a listed species' continued existence" under a "best scientific and commercial data possible" standard.[171] Not only does the overarching best scientific data requirement when evaluating "effects of a federal action" generally assure that all possible data being used to evaluate the effects of the action are "likely" scenarios, but agency interpretation of data would be seen as equally valuable in the face of lack of data. The requirement to find actions that are "reasonably certain" to occur likely confused courts like in the D.C. Circuit, which interpreted the "pessimistic data" as an outlier in the limited data set and likely interpreted that NOAA Fisheries' interpretation of such pessimistic data was not as "likely" to be true compared to the other best-case scenario data evaluated. The impression NOAA Fisheries left upon the District Court was that it was picking which science to work with not because it is "concrete," but out of capriciousness to prioritize "whales" over people.[172]

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168 *Maine Lobstermen's Ass'n*, 70 F.4th at 586.

169 *See supra* Part III for an analysis of case precedent.

170 *See supra* Part IV.

171 *See supra* Part II(C).

172 *See supra* Part IV.

This Note's proposal suggests the removal of the two-prong test because it (1) aligns with prior case holdings where the decision to grant a jeopardy ruling was based on the available data, and not necessarily based on the quality of the data, and (2) avoids further confusion in courts about what definitions to evaluate "effects of the action" under. Addressing the first point to align with case precedent, the Services could avoid the impression of being "arbitrary and capricious" when deciding what science to use when making a jeopardy finding simply by amending the June 2023 rule to eliminate the two-prong test and to evaluate effects of a federal action using the "best scientific data available" under § 402.02. As stated before, many listed species like the right whale have very little scientific data that explain its declining numbers, so the Services must use their best judgment and rely on the best scientific data available to give species' the benefit of the doubt. This would be consistent with the ruling in *Maine Lobstermen's Association* because in evaluating effects of an action using "best scientific data available" standard, it presumes that with the little scientific data there are regarding the right whale, all data considered are just as likely to be true as the next set of data, so the Services are not complicit in necessarily picking and choosing based on the quality of data. Indeed, this would also fit in with prior case precedent in saying that when presented with both sides, choosing the "worst-case scenario" data is not in itself a statement saying to disregard other forms of scientific data, but instead it is most beneficial to the listed species. This also aligns well with the overall purpose of the ESA, which is to conserve species before faced with almost certain extinction using the precautionary principle, in which the Services make decisions benefiting the species before their numbers are reduced to zero.

The second point to avoid confusion with court interpretation of "effects on an action" would be resolved because § 402.17—which lists a set of factors to consider when evaluating whether an action is reasonably certain to occur—would be removed. When the Services use a streamlined version of evaluating the effects of a federal action that will likely jeopardize a listed species using the best scientific data available, it allows flexibility for the agency to base its decisions based on its expertise. The Services would of course evaluate each listed species differently based on the amount of data available and their circumstances. Suppose NOAA Fisheries had to issue regulations for the right whale and another endangered marine species. Having to evaluate the effects of an action using a set of limited listed factors can pigeonhole NOAA Fisheries into considering some listed factors for the right whale and another set of factors for a different species. This inconsistency can alarm courts like in *Maine Lobstermen's Association* that can view pick-and-choose decision making as arbitrary.

Implementing this change would also be streamlined, as the rule has already gone through notice and comment, with some comments

from major environmental groups urging the Services to implement similar changes.[173] The Services would simply need to engage in the notice-and-comment period once more and implement the feedback into its amended rule.

However, it should be noted that the 2024 ruling of *Loper Bright Enterprises v. Raimondo* may have had a chilling effect on the NOAA Fisheries' desire to challenge the ruling of *Lobstermen's Association v. NMFS*.[174] The Court in *Loper Bright* has taken the direction of limiting agency discretion when interpreting their organic statutes in the face of ambiguity, meaning that without clarification of the Services' regulations, courts may be inclined to find that the Services' interpretations are arbitrary and capricious if there is a hint of ambiguity. In the case of the right whale and many other listed species, eliminating that ambiguity is a hard task to pull off. Eliminating a two-prong test may invite speculation from courts that NOAA Fisheries is acting arbitrarily in its decision making as it relates to endangered species protection. This position would severely run against the intent of the Endangered Species Act, which encourages the Services to utilize their expertise and best judgement to handle each species on a case-by-case basis.

Conclusion

The removal of the two-pronged test to evaluate the effects of a federal agency action under Section 7 of the ESA—particularly the removal of the "reasonably certain to occur" prong—would not only give the Services more agency to give species the benefit of the doubt in their decision making but will ultimately uphold prior court precedent and the overall purpose of the ESA to conserve species. In the face of limited data, endangered species like the right whale would benefit entirely from a flexible interpretation when evaluating the effects of a federal action, and a flexible interpretation would allow for a quicker response to address population die-offs as a precautionary measure before it is too late, and the species is lost forever.

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173 *See generally* Earthjustice, Comment Letter on Proposed Changes to Endangered Species Act §§ 4, 4(d), and 7 Regulations: 88 Fed. Reg. 40742; 88 Fed. Reg. 40753; 88 Fed. Reg. 40764 (June 22, 2023), https://earthjustice.org/document/biden-esa-technical-comments [https://perma.cc/8E48-H69H]. This comment letter was filed by Earthjustice on behalf of several other environmental groups such as the Center for Biological Diversity, The Humane Society of the United States (now known as Humane World for Animals, National Parks Conservation Association, Natural Resources Defense Council, Sierra Club, and WildEarth Guardians. *Id.*

174 *See generally Feds Won't Challenge Pro-Lobster Court Decision*, Saving Seafood (Sept. 11, 2023), https://www.savingseafood.org/news/law/feds-wont-challenge-pro-lobster-court-decision/ [https://perma.cc/WHJ3-5K9F].

Reservation Taps are Dry: The U.S. Government's Inability to Honor Treaty Obligations is Starving Diné of Water

*Sidney Lee**

Abstract

The Navajo Nation has implicit rights to use the water from the Colorado River mainstream – some of the most senior rights on the river. However, it has been unable to quantify those rights, despite repeated requests to the federal government to define its rights. This came to a head in the Supreme Court case, Arizona v. Navajo Nation, where the Supreme Court held that while the Navajo Nation possessed rights to the river, it was not the obligation of the United States to procure said rights for the tribe. This was a disappointing decision following decades of attempts to gain clarity. This paper will (1) detail the history of the Colorado River, (2) analyze the Navajo's steps to avoid this litigation in the first place, (3) explore the impacts of Arizona v. Navajo Nation, and (4) outline potential solutions for continuous provision of water to the Navajo Reservation. Following the Court's suggestion to go to the Legislature and President, this paper identifies short- and long- term goals to achieve equitable water allocation, including legislation allocating water, executive orders, and a continuation of drought mitigation efforts. Meanwhile, Arizona should focus on conserving water in its own communities and, most importantly, establish water courts, to alleviate gridlock in the courts that make water settlements especially difficult in Arizona.

Table of Contents

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I. Background

"There isn't enough water. But that doesn't mean that the Navajo Nation does not have valid rights that should be enforced, that they should have the ability to develop their water and then play on the same level with every other stakeholder in the basin."

—Heather Tanana, Professor of Law at the University of Utah, and Navajo Citizen[1]

Figure 1: Map of the Navajo Nation in the United States.[2]

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1 Becky Sullivan, *The Supreme Court wrestles with questions over the Navajo Nation's water rights*, Nat'l Pub. Radio (Mar. 20, 2023, 7:02 PM), https://www.npr.org/2023/03/20/1164852475/supreme-court-navajo-nation-water-rights [https://perma.cc/VQ27-7XL7].

2 Beth Osnes, *Solar-powered shadow puppetry in a high school science classroom 'illuminates' a Navajo student energy forum*, Rsch. Gate (July 2014), https://www.researchgate.net/publication/264200713_Solar-powered_shadow_puppetry_in_a_high_school_science_classroom_'illuminates'_a_Navajo_student_energy_forum [https://perma.cc/Z8D8-MTAK].

The Navajo Nation, also known as Diné Bikéyah, or Navajoland, stretches 27,000 miles across Utah, Arizona, and New Mexico.[3] For context, this is bigger than 10 of the 50 states.[4] The Navajo Nation is the largest federally recognized tribe in the United States, in both geography and population, with 399,494 enrolled members as of 2021.[5] The Navajo people, or as they refer to themselves, Diné, meaning "The People," are widely dispersed across the reservation, in part because of water scarcity that limits their settlement options.[6] This issue of limited availability only grows more dire with widespread drought in the Western United States ("West") and the failure of both the state and federal governments to define their allotment to the Colorado River mainstream.[7] This issue goes beyond the deprivation of a basic human right, as it is compounded by the cultural significance of water to Diné.[8] A popular Diné saying, "tó éí iiná," meaning "water is life," underscores Diné history as "original caretakers of the land" and their appreciation for water as the lifeblood of their communities.[9]

Drought has taken its toll on the entirety of the West but it has hit the Navajo Reservation particularly hard. With a population of approximately 170,000 people living on the Reservation, almost one-third cannot access a clean and reliable source of drinking water.[10] Throughout parts of the reservation, "as much as 91% of Navajo households 'lack access to water.'"[11] Residents without running water are forced to haul water home from sources on the reservation, often driving miles to access the basic need.[12]

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3 *History*, Off. Site of the Navajo Nation, https://www.navajo-nsn.gov/History [https://perma.cc/T3GW-GR37].

4 *Id.*

5 Arizona Cooperative Extension, Navajo Nation Quick Facts (2008), https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1471.pdf [https://perma.cc/LE86-CVRX]; Simon Romero, *Navajo Nation Becomes Largest Tribe in U.S. After Pandemic Enrollment Surge*, N.Y. Times (May 21, 2021), https://www.nytimes.com/2021/05/21/us/navajo-cherokee-population.html [https://perma.cc/VFW3-VQXN].

6 *Navajo Nation*, Indian Health Servs., https://www.ihs.gov/navajo/navajonation/ [https://perma.cc/MJ2R-96UX]; Diné refers to the people and culture of the Navajo Nation, while the Navajo refers to the governmental body.

7 Sullivan, *supra* note 1; Arizona v. Navajo Nation, 599 U.S. 555, 558 (2023).

8 Jaden Redhair, *Water is Life. Sharing Navajo Nation with the World*, Nalgene, https://nalgene.com/water-is-life-sharing-navajo-nation-with-the-world/ [https://perma.cc/L9YR-C6AD].

9 *Id.*

10 Sullivan, *supra* note 1.

11 Arizona v. Navajo Nation, 599 U.S. at 580 (Gorsuch, J., dissenting).

12 Sullivan, *supra* note 1.

Additionally, Diné "are 67 times more likely than other Americans to live without running water or a toilet" because of the U.S.'s failure to honor past treaty agreements to provide tribes with basic necessities, such as water, housing, and healthcare.[13] Per the Winters Doctrine, the Navajo Nation has first rights to the Colorado River mainstream, and yet it has been over 150 years with no definition of their rights. If the Navajo Nation does not know what its rights are, where it can draw water from, or how much water it can take, it is tantamount to it not having the rights at all.

Following the decision in *Arizona v. Navajo Nation*, in which the Navajo Nation sought clarity as to their allotment to the Colorado River, the Navajo Nation remains in the dark when it comes to its water rights, despite repeated requests for action to the federal government and the state of Arizona.[14] It has continually been denied the opportunity to represent itself and its interests in various litigation and arbitration over the Lower Basin's allocation.[15] The lack of avenues for governmental accountability are already impacting the Navajo Nation, as it has no course of action to compel the government to answer. Moreover, it will only get worse as competing interests become louder and the Navajo Nation is drowned out. There is a clear gap between the rights promised and the Navajo Nation's ability to enforce said rights. This paper first analyzes the history of Western water law's exclusion of the Navajo and then outlines steps for potential short- and long-term solutions. The shorter-term state legislation that will be explored includes the (1) establishment of mandatory water restrictions and (2) water courts to better handle the influx of water settlements. Longer-term solutions include (1) federal executive branch intervention and (2) potential legislation to quell disputes between Arizona and Navajo Nation.

A. The Navajo's Legal Rights to the River

The Navajo Treaty of 1868 ("1868 Treaty") allowed Diné to return to their ancestral homeland and established their current reservation.[16] The 1868 Treaty also recognized the Navajo Nation's sovereignty.[17] However, in exchange for its original territory and recognition of its

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13 *About the Project*, DigDeep, https://www.navajowaterproject.org/project-specifics?_gl=1*1kgx6jz*_ga*NDg4NDgwMjc0LjE3MDYzMDIyMjA.*_ga_NTF9CEP35Y*MTcwNjQ3MzYxNi4zLjEuMTcwNjQ3MzY0OC4yOC4wLjA [https://perma.cc/P6LJ-FVW6].

14 Arizona v. Navajo Nation, 599 U.S. at 574–75 (Gorsuch, J., dissenting).

15 *Id.* at 599 (Gorsuch, J., dissenting).

16 *Navajo Treaty of 1986*, Smithsonian Nat'l Museum of the Am. Indian, https://americanindian.si.edu/nk360/navajo/treaty/treaty.cshtml#:~:text=For%20the%20Navajo%20(Din%C3%A9)%20the,as%20Navajo%20(Din%C3%A9)%20people [https://perma.cc/3DFK-5UK4].

17 *Id.*

freedom to govern themselves, the Navajo Nation gave up its rights to occupation outside of reservation boundaries.[18] It further ceded control over the education of its children to the United States government, which required they be taught the "elementary branches of an English education" as "to insure the civilization of the Indians entering into" the 1868 Treaty.[19]

The 1868 Treaty rights were expanded with the Winters Doctrine, established in the 1908 Supreme Court case, *Winters v. U.S,* which held that when the federal government creates an Indian reservation, it implicitly reserves the right to use a sufficient amount of the river's water to fulfill the purposes of the reservation as a homeland.[20] This Doctrine is seen as the foundation of tribal water rights and stipulates that the rights are "considered as having been established as of the date the federal government created the reservation involved."[21] Practically, this means that tribal water rights are often senior to those of most other Western water users, such as states, due to the principle of prior appropriation.[22] Prior appropriation is essentially a "first-come first-serve" legal principle, holding that the first person to use the water for a "beneficial use" gets the rights to said water.[23] The standard of beneficial use is generally any "reasonably efficient uses of water for economic purposes," such as domestic, municipal, and industrial uses.[24] This is a recognized principle in Western water law, specifically in times of shortage, allowing senior right holders priority to a scarce supply.[25]

Distinct from the rules of prior appropriation, the water rights granted under the Winters Doctrine cannot be revoked for non-use, meaning that tribes do not have to be actively using the water to retain their rights to the water, as the rights extend to future needs as well as present needs.[26] Importantly, the Winters Doctrine establishes that a tribe has the right to access enough water to sufficiently meet the needs of the tribe, *even where a treaty provision expressly recognizing the*

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18 *Id.*

19 *Id.*

20 Winters v. United States, 207 U.S. 564, 576–77 (1908); *The Winters Doctrine: The Foundation of Tribal Water Rights*, Inter Tribal Council of Ariz., https://itcaonline.com/programs/tribal-leaders-water-policy-council/the-winters-doctrine-the-foundation-of-tribal-water-rights/ [https://perma.cc/H7HS-WJF7].

21 *The Winters Doctrine: The Foundation of Tribal Water Rights*, *supra* note 20.

22 *Id.*

23 *Id.*; *Glossary: Beneficial Use (of Water)*, Inst. for Sustainability, https://www.aiche.org/ifs/resources/glossary/isws-water-glossary/beneficial-use-water [https://perma.cc/NJH9-HQ3M].

24 *Glossary: Beneficial Use (of Water)*, *supra* note 23.

25 https://wires.onlinelibrary.wiley.com/doi/10.1002/wat2.1423

26 *Winters*, 207 U.S. at 577; *The Winters Doctrine: The Foundation of Tribal Water Rights*, *supra* note 20.

right does not exist.[27] This is premised on the idea that when Congress reserves land, it does so to ensure that the land will be useful to and sustain the inhabiting tribal community.[28] A grant of land without a grant of accompanying rights to the necessary resources would make the land uninhabitable, defeating the purpose behind creating an Indian reservation.[29] This means the tribes on that land have rights to the water that surpass even the prior appropriation principle, yet they remain without water.

B. The West's Law of the River

The fight over the allocation of water in the West came to a head in the Colorado River Compact of 1922 ("the Compact").[30] Water "allocation regimes" like the Compact "determine who is able to use water resources, how, when, and where."[31] The Compact divided the river into two basins and established an allotment for each: the Upper Basin, consisting of Colorado, New Mexico, Utah, and Wyoming, and the Lower Basin, consisting of Arizona, California, and Nevada, with Lee's Ferry in northern Arizona demarcating this division.[32] This interstate Compact is a crucial piece of the "Law of the River," which refers to the body of law that regulates the usage of the Colorado River.[33] The Compact was adopted in reaction to a 1922 Supreme Court decision in *Wyoming v. Colorado*, holding that the law of prior appropriation applied, *regardless* of state lines.[34] This left other Western states concerned that Lower Basin states, such as California, would establish priority rights to the waters of the Colorado River, as they were growing and establishing

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27 *Winters*, 207 U.S. at 577; *The Winters Doctrine: The Foundation of Tribal Water Rights*, *supra* note 20.

28 Mike Godbe, *An Overview of Indian Water Rights in California – Part 2 Federal Winters Rights*, Cal. Indian Legal Servs. (Aug. 17, 2021), https://www.calindian.org/an-overview-of-indian-water-rights-in-california-part-2-federal-winters-rights/ [https://perma.cc/9EPZ-P2M8].

29 *Winters*, 207 U.S. at 577; *The Winters Doctrine: The Foundation of Tribal Water Rights*, *supra* note 20.

30 *Id.*

31 OECD Studies on Water, Water Resources Allocation: Sharing Risks & Opportunities 17–19 (2015), https://www.oecd.org/content/dam/oecd/en/publications/reports/2015/04/water-resources-allocation_g1g507d6/9789264229631-en.pdf [https://perma.cc/C56C-33L5].

32 *Colorado River Compac*t, Water Educ. Found. (Mar. 2024), https://www.watereducation.org/aquapedia-background/colorado-river-compact [https://perma.cc/3ZSQ-Y5MZ].

33 *Colorado River compact*, Colo. Rev. Stat. § 37-61-101 (2025), https://www.usbr.gov/lc/region/pao/pdfiles/crcompct.pdf [https://perma.cc/X5AK-UMCA]. *See also* An Act To permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes, Pub. L. No. 67-56, 42 Stat. 171 (1921) (offering the federal statutory foundation for the Compact).

34 *See* Wyoming v. Colorado, 259 U.S. 419 (1922) (holding Colorado could not divert the Laramie River to the extent that it would impact Wyoming's amount of prior water usage).

rights quicker than the Upper Basin states.[35] Foreseeing states' future growth, the Compact was a way to establish rights for other states before California could effectively bar other Western states from using the water within their own boundaries under the law of prior appropriation.[36] The Compact apportioned the right to exclusive beneficial consumptive use of 7.5 million acre-feet ("AF") to each the Upper and Lower Basins, with the provision that the Upper Basin states would not deplete the flow of the river below an aggregate of 75 million AF for any period of 10 consecutive years.[37] This meant that the Upper Basin may use its allotted amount, but must also allow for sufficient water to flow through to the Lower Basin. The Lower Basin also received an additional allotment of one million AF, for a total allocation of 8.5 million AF.[38] The remainder of the flow was reserved for Mexico, which was later codified in 1944 with an international treaty.[39] While the Compact was pivotal for the Western United States' water rights, there was only a single reference to tribal water rights, stating that nothing in the Compact should be "understood to affect the U.S. government's obligation to tribal water rights."[40] This exclusion from the Compact is just one instance of the federal government's omission of tribal interests, as there was no explicit allocation of water for the tribes.

There are two primary methods of allocation at play in the Compact: priority, or fixed,[41] and proportional allocation.[42] First, fixed allocation is explicit in its apportionment, which gives users a "fixed" amount, but is highly dependent on availability of water and sufficient storage.[43] Further, fixed apportionment does not allow for flexibility, making it an especially problematic regime when allocations cannot be

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35 Joe Gelt, *Sharing Colorado River Water: History, Public Policy and the Colorado River Compact,* Univ. of Ariz.: Water Res. Rsch. Ctr. (Aug. 1, 1997), https://wrrc.arizona.edu/publication/sharing-colorado-river-water-history-public-policy-and-colorado-river-compact [https://perma.cc/5RVC-VDL6].

36 *Id.*

37 *Colorado River Compact, 1922*, *supra* note 33.

38 *Id.*

39 *Colorado River Records: California's Thirst*, Utah Div. of Archives and Recs. Servs. (Aug. 7, 2023), https://storymaps.arcgis.com/stories/966ca6a7beee4304acd51b4cf363a388 [https://perma.cc/G2DN-A68D]; Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Mex.-U.S., Feb. 3, 1944, 59 Stat. 1219.

40 *Colorado River Compact, 1922*, *supra* note 33.

41 For the remainder of this Note, priority, or fixed, allocation will be referred to as fixed allocation as to not be confused with the doctrine of prior appropriation.

42 Gelt, *supra* note 35, at 5.

43 Schmidt et al*., The Colorado River water crisis: Its origin and the future*, WIREs Water, For example, in fixed allocation, if the projected AF of a river was 2 million AF, then each user would be given an allocation totaling 2 million AF. The problem occurs when the projection is over-estimated. If the actual AF was 1 million AF, you have users that will not receive the water they were promised.

easily adjusted when changes are necessary.[44] Second, proportional allocations are dependent on water availability, which is subject to change as hydrological conditions fluctuate.[45] This method is much more flexible than fixed apportionment, but it greatly reduces certainty in water demand and does not adequately adjust to societal change.[46]

Ideally, an allocation regime will promote economic efficiency, environmental performance, and equity.[47] However, this can be a lofty goal, as the transition can be contentious with economic impact often being prioritized over resource conservation and equity.[48] These issues with the allocation regimes in the Compact are compounded by climate change's exacerbation of drought that has decreased the amount of available water flowing through the Colorado River.[49]

To make matters worse, the annual flow that the original apportionments were based on were taken from "dubious readings maintained by the Bureau of Reclamation during a multi-year period that saw the river rage higher than at any other point in its recorded history."[50] This left the Lower Basin states with an overstated allotment of the Colorado River mainstream, rapidly growing populations and centers of commerce, and the task of dividing it all up between themselves. As is to be expected, this was the source of much tension among the Lower Basin states, as Arizona and California could not agree on how to divide their shares of the river.[51] This resulted in their inability to ratify the Compact, preventing it from becoming formal law.[52]

Finally, Congress had to intervene with the passage of the Boulder Canyon Project Act in 1928, which included a provision to make the Compact legally binding, in addition to providing a federal mandate for construction of the Hoover Dam.[53] This was the federal government's attempt to quell disputes over water rights in the Lower Basin

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44 Changes would be necessary in times of drought when there is not enough water to fulfill the apportionments. *Id.*.

45 *Id.*

46 Societal changes refer to growing population or industry boom. *Id.*.

47 OECD Studies on Water, *supra* note 31, at 14.

48 *Id.* at 9.

49 U.S. Army Corps of Eng'rs, Aspects of Governing Water Allocation in the U.S. 77-82 (Maria T. Lantz et al. eds., 2014).

50 *Colorado River Records: California's Thirst*, *supra* note 39.

51 *Colorado River Records: Delayed Ratification*, Utah Div. of Archives and Recs. Servs. (Aug. 7, 2023), https://storymaps.arcgis.com/stories/966ca6a7beee4304acd51b4cf363a388 [https://perma.cc/G2DN-A68D]. At this point, Nevada was, by far, the least powerful of the Lower Basin, as it was smaller and did not have the economic powerhouse that Las Vegas is today.

52 *Id.*

53 *Colorado River Records: Boulder Canyon Project Act*, Utah Div. of Archives & Recs. Servs. (Aug. 7, 2023), https://storymaps.arcgis.com/stories/966ca6a7beee4304acd51b4cf363a388 [https://perma.cc/G2DN-A68D].

between Arizona and California.[54] California was granted 4.4 million AF/year, Arizona was granted 2.8 million AF/year, and Nevada was left with the remaining 300,000 AF/year, with California and Arizona splitting any surplus in half.[55] Further, the Boulder Canyon Project Act required ratification by six Western states, out of seven participating states,[56] including California, to be legally binding.[57] This succeeded, despite Arizona refusing to ratify out of protest.[58] While this divided the Basin amongst the states, many other stakeholders—like the Navajo Nation and other Western tribes—remained within each state. As per the Boulder Canyon Act, it is the responsibility of the states to divvy up their established rights amongst stakeholders, including tribes, within their boundaries.[59] The Boulder Canyon Project Act was reaffirmed in the ruling in *Arizona v. California*.[60]

C. Arizona v. California

> *"We are United States citizens, but we're not treated like that. You can hear the frustration, the tone of my voice. We once again have been forgotten by our own government."*
>
> *—Navajo Nation President Jonathan Nez*[61]

While it was the hope of the federal government that the Boulder Canyon Project Act would put the Lower Basin's allotment arguments to rest, it did not have that effect. In 1952, Arizona filed suit against California, "seeking a declaration of its water rights in the Lower Basin," in what would end up being "one of the longest-running water rights cases" in U.S. judicial history.[62] The Federal Government intervened, claiming to "protect federal interest, including the rights of the Navajo Nation."[63]

The Navajo Nation, fearful the federal government was not adequately protecting its interests, sought leave to file a motion "'to define the scope of the representation' and objecting to what [it] considered

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54 *Colorado River Records: Delayed Ratification*, *supra* note 51.

55 *Colorado River Records: Boulder Canyon Project Act*, *supra* note 53; Arizona v. California, 373 U.S. 546 (1963).

56 The seven states involved were California, Arizona, Nevada, New Mexico, Colorado, Wyoming, and Utah. *See Colorado River Records: Delayed Ratification*, *supra* note 51.

57 *Colorado River Records: Boulder Canyon Project Act*, *supra* note 53.

58 *Id.*

59 *Id.*

60 Arizona v. California, 373 U.S. at 564–65.

61 DigDeep, *supra* note 13.

62 Arizona v. Navajo Nation, 599 U.S. 555, 581; Arizona v. California, U.S. Dep't of Just. Env't & Nat. Res. Div., https://www.justice.gov/enrd/indian-resources-section/arizona-v-california [https://perma.cc/SU4W-NMM2].

63 Arizona v. Navajo Nation, 599 U.S. 555, 581.

'a lack of effective representation and [a] conflict of interest.'"[64] This motion was then denied.[65]

The Supreme Court eventually referred the case to a Special Master that advised the U.S. refrain from mentioning the Navajo Nation.[66] Concerned again that it was not receiving sufficient representation under the federal government, the Navajo Nation sent the Attorney General a letter, requesting they object to the recommendation on its behalf.[67] The Navajo Nation never received a response.[68]

In 1961, the Navajo Nation filed a motion to intervene, citing the federal government's failure to assert its interests and claiming it had "'abandoned the case so far as the adjudication of the rights of the Navajo Indians [was] concerned.'"[69] The U.S. opposed this motion, claiming that Navajo intervention was unnecessary, considering it was already representing the interests of several Tribes.[70] Simultaneously, however, the federal government conceded that evidence would have to be submitted on behalf of the Navajo Nation, to be considered by the Court, and the U.S. had not submitted such evidence.[71] Like their many other pleas for clarity, their motion to intervene was denied.[72]

Finally, the case was decided in 1964, with the court allocating the waters of the Lower Basin.[73] Amongst the allocatees were the five tribes whose interests were *explicitly* asserted by the federal government. The court in *Arizona v. California* held:

> [I]n creating the Chemehuevi, Cocopah, Yuma, Colorado River, and Fort Mohave Indian Reservations, the United States reserved enough water from the Colorado River to irrigate the irrigable parts of the reserved lands, for future as well as present needs, and such water rights are "present perfected rights" entitled to priority.[74]

Present perfected rights are senior water rights that were established before the Compacts, therefore affording rightsholders high priority to the Colorado River mainstream.[75] These are the same rights the Navajo Nation already possesses, as per the 1868 Treaty and the Winters

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64 *Id.* at 582.

65 *Id.*

66 *Id.*

67 *Id.*

68 *Id.*

69 *Id.*

70 *Id*. at 583.

71 *Id.*

72 *Id.*

73 *Id.*

74 Arizona v. California, 373 U.S. at 595.

75 *See* Jonathan R. Schutz, *Present Perfect Rights: The Most Senior Undefined Water Rights on the Colorado River*, 16 Univ. Denver Water L. Rev. 381, 382 (2013), https://digitalcommons.du.edu/cgi/viewcontent.cgi?article=1364&context=wlr#:~:text=I.&text=Present%20perfected%20

Doctrine. However, unlike the five tribes explicitly listed in the 1964 Decree that resulted from the decision of *Arizona v. California*, the Navajo Nation's present perfected rights were not enumerated.[76] Once again, the Navajo Nation was left questioning its allotment of the Colorado River mainstream.[77]

Since the decision in *Arizona v. California*, the Navajo Nation has repeatedly asked the federal government to assess their rights to the mainstream. The most recent response from the Department of Interior said that it did not have, and was not looking for, an answer.[78] As demonstrated, the Navajo Nation's mainstream rights have lacked clarity since their inception, despite repeated requests by the Navajo Nation to assert its interests.[79] The Navajo Nation is adjacent to the mainstream of the Colorado River, but its rights to the river water still remains unadjudicated.[80] The furthest the federal government has gone in outlining these rights is to concede that its rights "may include some portion of the mainstream of the Colorado."[81] This culminated in the Navajo Nation bringing suit against the state of Arizona to procure an answer.[82]

D. Arizona v. Navajo Nation

The Navajo Nation sought relief to compel the federal government to assess its water rights in *Arizona v. Navajo Nation.*[83] Three Western states–Arizona, Nevada, and Colorado–"intervened *against* the Tribe to protect those States' interests in water from the Colorado River."[84] The justification for their intervention is that any diversion to the Navajo Reservation "would come at the expense of their states' populations and economies."[85]

Ultimately, the Supreme Court refused to quantify the Navajo Nation's water rights, ruling that while the Tribe possesses water rights, it is not the job of the federal government to procure those rights for it.[86] The opinion concludes with: "[t]he 1868 treaty reserved necessary water to accomplish the purpose of the Navajo Reservation. But the treaty did

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rights%20(%22PPRs%22,less%20certain%20in%20the%20details [https://perma.cc/R4PM-RVXK] (discussing the definition of present perfected rights).

76 Arizona v. California, 373 U.S. at 595.

77 Arizona v. Navajo Nation, 599 U.S. 555 at 583 (Gorsuch, J., dissenting) .

78 *Id.* at 583–84.

79 *Id.*

80 *Id.* at 580–81.

81 *Id.* at 581.

82 *Id.* at 584.

83 *Id.*

84 *Id.* at 555 (emphasis added).

85 Sullivan, *supra* note 1.

86 Arizona v. Navajo Nation, 599 U.S. at 560, 565.

not require the United States to take affirmative steps to secure water for the Tribe."[87] Importantly, the federal government has never *denied* the Navajo's potential water rights to the mainstream; it has just never given an explicit answer. The Court essentially told the Navajo that it is barking up the wrong tree, as it is not the judiciary's role to change the law, despite Article VI of the Constitution, which "extends '[t]he judicial Power' to cases 'arising under…Treaties made, or which shall be made.'"[88] Despite this Constitutional mechanism to do so, the Navajo Nation did not even ask the Court to *change* the law; it simply asked for an elaboration of its rights.[89] Justice Gorsuch, in his dissent, makes a bleak comparison, highlighting the struggles of the Navajo Nation at the whims of an unaccountable bureaucracy:

> To date, their efforts to find out what water rights the United States holds for them have produced an experience familiar to any American who has spent time at the Department of Motor Vehicles. The Navajo have waited patiently for someone, anyone, to help them, only to be told (repeatedly) that they have been standing in the wrong line and must try another.[90]

While a favorable decision in the *Arizona v. Navajo Nation* case would not have alleviated water scarcity problems overnight, it would have been a crucial step towards increased access for those living on the reservation.[91]

In response to the ruling, the Navajo Nation's Office of the Attorney General was optimistic, as "the majority's opinion left open the possibility that the [Navajo] Nation can intervene in future water-rights litigation that 'affect their claimed interests'–an avenue the [Navajo] Nation is currently exploring."[92] Tribal advocates breathed a sigh of relief at the decision, as they were concerned the Supreme Court would overturn the Winters Doctrine.[93] However, the Supreme Court, and federal government as a whole, should be held to a higher standard and be expected to follow through on their obligations. If there is celebration over a century-old right remaining in place, while tribes still have some vague, unquantified right to basic needs, it is past-due time to question whether the federal government is functioning as it was so intended.

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87 *Id.* at 569–70 (citation omitted).

88 *Id.* at 585 (Gorsuch, J., dissenting) (quoting U.S. Const. art. III, § 2, cl. 1).

89 *Id.* at 565.

90 *Id.* at 598.

91 Sullivan, *supra* note 1.

92 Press Release, Navajo Nation Dep't of Just., Navajo Nation Water Rights Intact After SCOTUS Ruling (June 29, 2023), https://nndoj.navajo-nsn.gov/Portals/0/Press%20Releases/2023/2023.6.29%20Press%20Release_Navajo%20Nation%20Water%20Rights%20Intact%20After%20SCOTUS%20R. . ..pdf [https://perma.cc/6XRW-Z6Q8].

93 Anna V. Smith, Umar Farooq & Mark Olalde, *Supreme Court Keeps Navajo Nation Waiting for Water*, ProPublica (June 26, 2023, 2:00 PM), https://www.propublica.org/article/supreme-court-navajo-nation-water-rights-scotus [https://perma.cc/7B85-62YQ].

It is admirable that the Navajo Nation continues to push forward with positivity, as it is very familiar with the federal government failing it, but non-indigenous residents, specifically in the West, need to be more critical of the U.S. government's handling of Native issues. Without a defined water right secured through federal court, the Navajo Nation, and tribes alike, must turn to the states to determine their allotment.[94]

E. Difficulties with Water Settlement Negotiations in Arizona

> *"The state perceives any strengthening of tribal sovereignty within the state boundaries as a threat to their own jurisdiction and governing authority."*
>
> *—Torivio Fodder, Manager of the University of Arizona's Indigenous Governance Program and Taos Pueblo Citizen*[95]

The Winters Doctrine ensures that tribes have the right to water on their reservations, which was emphasized by the decision in *Arizona v. Navajo Nation*, but they still need to quantify their allotment to receive the water.[96] Traditionally, they have two options to achieve this: reach a settlement with the stakeholders–typically the state they are located in, the federal government, and other interested parties–or go to court.[97] The process varies in each state, but it is especially difficult in Arizona, assumedly due to the sheer amount of federally recognized tribes located within state lines.[98] Currently, there are twenty-two recognized tribes in Arizona, with ten of them not having reached a settlement.[99] The disparity in settlements has been attributed to Arizona's aggressive negotiating tactics, as they create '"additional hurdles' to settling tribes water claims that do [not] exist in other states" and often attempt to force tribes to agree to terms unrelated to water.[100] Some examples of these concessions include: making a tribe's renewal of casino licenses contingent on reaching a water settlement, agreeing to terms that would restrict its ability to expand its reservations, and forfeiting the right to groundwater claims.[101] The inability to reach agreements with large swathes of tribes comes on the heels of Arizona state representatives inserting language into federal legislation preventing the Navajo from

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94 Olade et al., *infra* note 97.

95 Mark Olalde, Umar Farooq & Anna V. Smith, *How Arizona Stands Between Tribes and Their Water,* ProPublica (June 14, 2023, 6:00 AM), https://www.propublica.org/article/how-arizona-stands-between-tribes-and-their-water [https://perma.cc/QP7F-GT3Q].

96 *Id.*

97 *Id.*

98 *Id.*

99 *Id.*

100 *Id.*

101 *Id.*

bringing water from New Mexico into Arizona until it could reach a settlement with the State.[102]

Arizona is withholding a basic need to secure a more favorable settlement with tribes that are already being overlooked by the federal government. Understandably, many tribes have not "been able to get to settlement in some cases because Arizona [imposes] conditions that they find completely unacceptable."[103] State legislatures have argued these terms are necessary to "put the State on a level playing field with the tribes," asserting they do not have any other leverage in negotiations.[104] This claim is questionable at best and dangerously misinformed at worst, considering the State's leverage over the Navajo Nation is its rightful access to clean, drinkable, and running water. Even the Department of the Interior ("DOI"), the agency that refused to quantify the Navajo Nation's water rights in the first place, has raised objections to Arizona's proposed terms–specifically concerning restricting reservation expansion–calling the practice "contrary to this Administration's strong support for returning ancestral lands to Tribes."[105] However, the DOI has yet to act against Arizona's predatory negotiation practices.[106]

The pressure to settle with Arizona has become even greater for the Navajo Nation, with a multimillion-dollar pipeline being built by the federal government to bring water from the San Juan River in New Mexico and deliver it to Window Rock, Arizona--the capital of the Navajo Nation.[107] It is expected to be completed in 2027; however, if the Navajo Nation has not yet reached a settlement with the State, the pipe cannot legally deliver the water.[108] It can often take decades to settle a tribe's water rights claims.[109]

In most cases, if unable to reach a settlement, the tribe would turn to the courts for an answer.[110] While the Navajo Nation's suit against

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102 *Id.*

103 *Id.*

104 *Id.*

105 *Id.*

106 The Department of the Interior can issue policy guidance for water rights settlement in addition to their authority to oversee and coordinate the settlements between tribes and states. This includes the negotiation and the resulting settlement. Charles V. Stern & Mariel J. Murray, Cong. Rsch. Serv., R44148, Indian Water Rights Settlements (2024), https://www.congress.gov/crs-product/R44148/.

107 Suman Naishadham, *15 Native American tribes to receive $580 million in federal money for water rights settlement*, Pub. Broad. Serv. (Feb. 2, 2023, 8:29 PM), https://www.pbs.org/newshour/politics/15-native-american-tribes-to-receive-580-million-in-federal-money-for-water-rights-settlement [https://perma.cc/DNP5-FX8E]; Olalde et al., *supra* note 95 (sources conflict on how much money is spent on the project – ProPublica is referring to the overall grant from the infrastructure bill and PBS is referring to the specific grant to the Navajo Nation).

108 Olalde et al., *supra* note 95.

109 *Id.*

110 *Id.*

the federal government in *Arizona v. Navajo Nation* was unsuccessful, it still has the ability to sue in Arizona state court to fight for an allotment.[111] However, Arizona makes the court process just as difficult, if not more difficult than, the negotiation process.[112] Often times litigation can be riskier than negotiation because the apportionment is determined by the court, rather than the parties, making tribes hesitant to pursue this remedy.[113] Additionally, the process is slow, and the "court system has created gridlock."[114] Other Western states have attempted to address this inefficiency in settling water disputes by establishing commissions or specialized water courts.[115] For example, Colorado's Judicial Branch includes water courts with "seven water divisions based upon the state's drainage patterns" and designated groundwater basins.[116] Further, all the divisions are "staffed with a division engineer appointed by the state engineer, a water judge appointed by the Supreme Court [of Colorado], a water referee appointed by the water judge, and a water clerk assigned by the district court."[117] Judges presiding over the water courts "have jurisdiction in the determination of water rights, the use and administration of water, and all other water matters within the water divisions," allowing for a relatively speedy resolution.[118]

While the inefficiencies in the Arizona court system are recognized, there have not been any steps towards remediation.[119] Arizona has made it clear it is in no hurry to quantify to the rights of the Navajo Nation and other tribes still in settlement negotiations or litigation through the state court system.[120] Arizona can afford to delay, as it will just continue to drain tribes of both their rightful water and litigation expenses, resulting in an eventual settlement that is even more favorable to the State.[121] Tribes, however, grow more desperate for access to clean, running water. There is a stark power imbalance between the tribes and the State, despite what Arizona officials may believe.[122]

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111 *See* Smith et al., *supra* note 93.

112 *See* Olalde et al., *supra* note 95.

113 *Id.*

114 *Id.*

115 *Id.*

116 *How do Colorado Courts Work?*, Colo. Ct. Recs., https://coloradocourtrecords.us/water-court/ [https://perma.cc/J3ZL-7466].

117 *Water Courts*, Colo. Jud. Branch, https://www.courts.state.co.us/Courts/Water/Index.cfm [https://perma.cc/W26T-8ER5]

118 *Id.*

119 *See* Olalde et al., *supra* note 95.

120 "The Navajo Nation has negotiated with all three states where it has land – Arizona, New Mexico, and Utah – and has completed water settlements with two of them. [They are] partners in those states, New Mexico, and Utah, […] but when it comes to Arizona, it seems like [the State and the Navajo Nation] have different agendas." *Id.*

121 *See* Olalde et al., *supra* note 95.

122 *See id.*

The federal government needs to honor its promises to the Navajo Nation and intervene on behalf of the tribe to help lessen this disparity. In the lack of federal and state help, the Native community has acted in bringing water to the Navajo Nation.[123]

F. Community Efforts on the Reservation

The Navajo is currently receiving help from collective community action and indigenous organizations. One of these organizations is DigDeep, which is currently operating the Navajo Water Project.[124] It installs off-grid Home Water Systems to bring hot and cold running water to homes without the need for water or sewer lines.[125] In addition to providing these alternate utilities, it disperses grants through the Water is Life Fund for communities with their own solutions to the water scarcity issue.[126]

It is not just organized groups that are attempting to help their communities, but also individuals. Darlene Arviso, also known as the "Water Lady," delivers water to fellow Diné once a month to help them shoulder the burden of water scarcity.[127] As the only person in her entire family to have running water, she delivers water to 250 homes every month.[128] She has been called a "living saint" and compared to Santa Claus by the people she brings the water to.[129]

As inspiring as these stories are, the burden of this scarcity should not be placed solely on the shoulders of the communities. Additionally, these solutions are only temporary bandages on a worsening crisis. In this situation, government intervention and assistance are necessary to form long-term, staying solutions. However, long-term solutions, such as legislation, generally take significant time to enact,[130] making it crucial to explore shorter-term institutional solutions as well. The proposed

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123 *See id.*

124 *Navajo Water Project*, DigDeep, https://www.navajowaterproject.org/?_gl=1*1j0t4a5*_ga*NDg4NDgwMjc0LjE3MDYzMDIyMjA.*_ga_NTF9CEP35Y*MTcwNjQ3MzYxNi4zLjEuMTcwNjQ3MzY0Mi4zNC4wLjA [https://perma.cc/Y7K4-635H].

125 DigDeep, *supra* note 13.

126 *Id.*

127 Laurel Morales, *For Many Navajo, A Visit From The 'Water Lady' Is A Refreshing Sight*, Nat'l Pub. Radio: Code Switch (Jan. 6, 2015, 3:57 AM), https://www.npr.org/sections/codeswitch/2015/01/06/374584452/for-many-of-navajo-nation-water-delivery-comes-monthly [https://perma.cc/VP3B-73SJ].

128 *Id.*

129 *Id.*

130 Referring to the multiple factors that can make passing legislation unpredictable such as political division, time in the relevant Committee, and whether the bill passes, which can result in the process restarting. *See generally How a Bill Becomes a Law*, Nat'l Volunteer Fire Couns., https://www.nvfc.org/how-a-bill-becomes-a-law/#:~:text=For%20a%20bill%20to%20become,as%20long%20as%20100%20years [https://perma.cc/VY35-4YKF].

shorter-term solutions will be simpler to enact and more consistent than the community action already being taken. Unfortunately, it is not surprising that the United States government is behaving this way, as it is par for the course, especially for the Navajo Nation.

II. A Path Forward

> *"It is important that we stay positive as leadership even though we are put back in a familiar position as Navajo people have been urging this reconciliation for years. If anything, this ruling motivates us to get back in the fight for our homelands and claims to water."*[131]
>
> *—Navajo Nation Council Speaker Crystalyne Curley*

In Arizona, the traditional methods of procuring water apportionments for the Navajo Nation are not working considering the difficulties the Tribe has experienced in quantifying their rights with the State. To effectively address the issue of undefined water allotment, there must be long- and short-term goals working in tandem to alleviate the Navajo's water scarcity quickly. Additionally, there needs to be a focus on building up systemic statutory infrastructure focused on the creation of a more equitable water rights system. The Supreme Court in *Arizona v. Navajo Nation* recommends that Congress and the President pass legislation to procure needed water.[132] The Court suggests that if the legislature intends to remedy this issue, it must expand upon the duties listed in the 1868 Treaty.[133]

> For its part, Congress could independently consider legislation to apportion water rights to the Navajo Nation, or among some or all of the rights holders in the region. Similarly, Congress could direct an agency official such as the Secretary of the Interior to assess or quantify any of those rights. Congress could also require the United States to take any or all of the specific affirmative actions requested by the Navajo Nation, or it could choose to continue to await action by the executive branch to negotiate and recommend enactment of specific settlements.[134]

This section will address the actions that the federal government – specifically the executive and legislative branches – and the Arizona

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131 *Navajo Nation Water Rights Intact After SCOTUS Ruling*, Navajo Nation Water Rts. Comm'n (June 29, 2023), https://nnwrc.navajo-nsn.gov/EasyDNNmodules/navajo-nation-water-rights-intact-after-scotus-ruling [https://perma.cc/3MBS-5M57].

132 Arizona v. Navajo Nation, 599 U.S. 555 at 567.

133 Mainon A. Schwartz & Kristen Hite, Cong. Rsch. Serv., LSB11001, "Reserved" but Not "Secured": Supreme Court Sinks Navajo Nation's Attempt to Compel Federal Action on Tribal Water Rights (2023).

134 *Id.*

state government should consider if they are to build a more resilient water rights system.

A. Short Term Goals to Help Immediately Alleviate Water Scarcity

Right now, the most pressing issue for the Navajo Nation is the lack of access to clean, running water. Therefore, the most immediate steps that need to be taken must focus on procuring said water for the members of the Navajo Reservation. This can be accomplished by the Arizona state government, through the imposition of mandatory water restrictions and the Executive Branch, through an Executive Order.

While a Tribe is not a ward of the state, Arizona should allocate its share of the Colorado River to various parties within the state's borders, including the Navajo Nation, as per the Boulder Canyon Project Act.[135] One of Arizona's main justifications for its inability to reach a settlement with the Tribe is the scarcity of water in its own cities.[136] The average American uses around 100 gallons of water per day.[137] The average Diné uses around 7 gallons of water per day.[138] If states want to protect their residents and economies, it would likely be more impactful to impose water use restrictions in their own communities before attempting to stymie the rights of those consuming less than 1/10th of their everyday usage. Thus, the first thing Arizona should do is to further invest in water conservation across the state by imposing stricter mandatory water restrictions and focusing on the water needs of *all* those living within the boundaries of Arizona. If Arizona is truly worried that diversions of the river will impact its population's supply of water, it should be focusing on reducing the water consumption of its over 7 million citizens who consume, on average, 100 gallons of water per day, rather than depriving 170,000 tribal people, who consume on average, 7 gallons of water per day.[139] If Arizona were to get each person to reduce their average consumption by 5 gallons per day, it would be saving 35 million gallons every day.[140] If it continues to pursue depriving the Navajo Nation of its water, assuming that full enjoyment would be

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135 43 U.S.C. § 617r (2025).

136 Arizona v. Navajo Nation, 599 U.S. 555 at 561.

137 Laurel Morales, *For Many Navajo, A Visit From the 'Water Lady' is a Refreshing Sight*, Nat'l Pub. Radio: Code Switch (Jan. 6, 2015, 3:57 AM), https://www.npr.org/sections/codeswitch/2015/01/06/374584452/for-many-of-navajo-nation-water-delivery-comes-monthly [https://perma.cc/KHE5-7YDN].

138 *Id.*

139 *QuickFacts: Arizona*, U.S. Census Bureau, https://www.census.gov/quickfacts/fact/table/AZ/PST045223 [https://perma.cc/583Q-NGM7]; *Navajo Nation Profile*, Navajo Nation Wind, https://navajoprofile.wind.enavajo.org/ [https://perma.cc/H739-P4UN]; Morales, *supra* note 137.

140 Average consumption of the state being (7,000,000 x 100) = 700,000,000 gallons/day. Reduction by 5 gallons being (7,000,000 x 95) = 665,000,000 gallons/day. Amount of water saved being (700,000,000 – 665,000,000) = 35,000,000 gallons/day.

equivalent to the average U.S. water usage of 100 gallons per day, it will only save 15.8 million gallons per day – less than half of what it would save with minor restrictions on Arizona residents.[141]

While water restrictions are conservation measures to reduce water usage,[142] limiting household water use does not need to be life altering to make an impact, especially in the case of Arizona. According to the Environmental Protection Agency ("EPA"), "if homeowners with irrigation systems [i.e., yard sprinklers] hired irrigation professionals certified through a[n approved] program to perform regular maintenance, each household could reduce irrigation water by 15[%], or nearly 9,000 gallons[per year per household]."[143] It calls attention to warm, dry climates, like states in the Southwest United States, asserting that up to 50% of outdoor water use in these areas are wasted "due to evaporation, wind, or runoff caused by inefficient irrigation methods and systems."[144] By merely watering their lawns more efficiently, average water consumers in Arizona could save up to six gallons of water per day, greatly outpacing the water saved by depriving the Navajo Nation of basic human needs.[145] The gallons saved can be increased by replacing traditional grass lawns with native plants, which need very little water outside of average rainfall.[146]

Currently, Arizona has conservation mandates for its Active Management Areas.[147] Active Management Areas were established as part of Arizona's Groundwater Management Act, which designated these areas as requiring "the highest level of management, with the most extensive provisions" because the "groundwater overdraft [was] the most severe."[148] These designations "were established to provide

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141 Morales, *supra* note 137. Average consumption by the Navajo Nation being (170,000 x 7) = 1,190,000 gallons/day. Reservation consumption if equivalent to the State being (170,000 x 100) = 17,000,000 gallons/day. Amount of water saved being (17,000,000 – 1,190,000) = 15,810,000 gallons/day.

142 *Drought Preparedness & Water Conservation*, Am. Red Cross, https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/drought.html#:~:text=Water%20Restrictions,at%20night%2C%20or%20on%20weekends [https://perma.cc/X4A9-MBCP].

143 *Outdoor Water Use in the United States*, EPA: WaterSense, https://19january2017snapshot.epa.gov/www3/watersense/pubs/outdoor.html [https://perma.cc/Q8VD-75RD].

144 *Id.*

145 Morales, *supra* note 137. (Assuming the average household refers to 4 people) Outdoor water reduction per person per year being (9,000/4) = 2,250 gallons saved/person/year. Average outdoor water reduction per person per day being (2,250/365) = 6.16 gallons saved/person/day.

146 *Outdoor Water Use in the United States*, *supra* note 143.

147 *Ensuring Water Supply Sustainability: the Arizona Department of Water Resources' Drought and Water Supply Planning,* EPA (2015), https://19january2021snapshot.epa.gov/sites/static/files/2015-10/documents/az_water_supply_plan_final_10_28_15.pdf [https://perma.cc/HQ5E-HZHJ].

148 *Overview of the Arizona Groundwater Management Code*, Ariz. Dep't of Water Res., https://www.azwater.gov/sites/default/files/media/Arizona%20Groundwater_Code_1.pdf [https://perma.cc/6YS2-64YP].

long-term management and conservation of limited groundwater supply."[149] The mandatory measures include requiring users to meter and report water use and pay withdrawal fees for groundwater usage, all of which is overseen by the Arizona Department of Water Resources ("ADWR").[150] Currently, about 80% of the population of Arizona resides in these Active Management Areas.[151] Therefore, it is well within the purview of the ADWR to place mandatory conservation measures on a majority of the population under the authority of the Groundwater Management Act.

Additionally, Arizona has enough water to go around, not having to rely solely on the Colorado River for its water supply.[152] The State receives about 36% of its total water from the Colorado River, with the remainder coming from groundwater, rivers in-state, and reclaimed water.[153] Within the state, the 100 Year Water Supply Requirement mandates that Arizona's urban areas must prove they possess a 100-year supply of water before developing more land, to ensure there is enough water to support a larger population.[154] The requirements provide that the water supply must be of good quality; legally, financially, and physically available; and renewable.[155] This has resulted in Arizona having collected "trillions of gallons of water underground to be used in the future," all while the Navajo Reservation residents' water access was blocked by Arizona during the COVID-19 Pandemic.[156] This worsened the impacts of the pandemic on the Navajo Nation, as "[its] limited clean water supply was contributing to the virus' spread on the reservation."[157] The Navajo Nation even made a plea to Governor Doug Ducey for assistance and access to water during the pandemic, and its plea was rejected.[158] In an ideal world, Arizona would quantify the Navajo Nation's water rights efficiently and equitably. Unfortunately, it has continued to ignore, deny, and blatantly oppose requests from indigenous communities.

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149 *Ensuring Water Supply Sustainability: the Arizona Department of Water Resources' Drought and Water Supply Planning*, *supra* note 147.

150 *Id.*

151 *Id.*

152 *Id.*

153 *Arizona's Water Supplies*, Ariz. Dep't of Water Res.: Ariz. Water Facts, https://www.arizonawaterfacts.com/water-your-facts [https://perma.cc/A84Z-9RFV].

154 *Id.*

155 *Id.*

156 Olalde et al., *supra* note 95.

157 *Ensuring Water Supply Sustainability: the Arizona Department of Water Resources' Drought and Water Supply Planning*, *supra* note 147.

158 Olalde et al., *supra* note 95.

The Executive Branch should also act quickly by issuing an executive order compelling the DOI to quantify the Navajo Nation's water rights in a timely manner. The Boulder Canyon Project Act gave the Secretary of the Interior the power to "divvy up the resulting impounded water" of the Lower Basin.[159] This power was utilized shortly after the Act when the Secretary "began issuing contracts to various users."[160] The Navajo Nation also sought to utilize said power when they requested the Secretary of the Interior assess their rights to the Colorado mainstream—a request that was ignored.[161] An executive order is a way for the President to issue policy directives "intended to have the force and effect of law."[162] For the executive order to become legally enforceable, it must be within the bounds of the President's Constitutional power or a power delegated to them by Congress.[163] In this case, the DOI is an executive agency, whose head is appointed by the President (with Congressional confirmation) and can be removed at will by the President.[164] Therefore, it is not considered to be an independent agency under the purview of administrative law, as it does not operate independently of the President's wishes, and is firmly within the powers of the President.[165]

In this proposed executive order, the President's directive must have both an explicit timeline and language. The language should direct the Secretary of the Interior to commence an assessment into the water rights of the Navajo Nation and to report the findings to the Navajo Nation so they may know their rightful claims to the Colorado River. Therefore, if the expressed deadline passes without a determination of the Navajo Nation's rights, the Navajo Nation would have the ability to bring suit against the DOI for failure to implement rules pursuant to the executive order.[166] This is because a non-statutory executive order of substance "can bind agencies under the principle that they must

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159 Arizona v. Navajo Nation, 599 U.S. 555, 581.

160 *Id.*

161 *Id.* at 583.

162 Abigail A. Graber, Cong. Rsch. Serv., R46738, Executive Orders: An Introduction (2021), https://crsreports.congress.gov/product/pdf/R/R46738#:~:text=%E2%80%A2%20Authority%20for%20Executive%20Orders.&text=have%20the%20force%20and%20effect,delegation%20of%20power%20from%20Congress [https://perma.cc/7ZZR-Z34Q].

163 *Id.*

164 Mark K. DeSantis, Cong. Rsch. Serv., R45480, U.S. Department of the Interior: An Overview (2021), https://crsreports.congress.gov/product/pdf/R/R45480/2#:~:text=The%20U.S.%20Department%20of%20the,estate%20of%20the%20United%20States [https://www.congress.gov/crs-product/R45480].

165 Robert L. Glicksman & Richard E. Levy, Administrative Law: Agency Action in Legal Context 744 (3rd ed. 2010).

166 Peter Raven-Hansen, *Making Agencies Follow Orders: Judicial Review of Agency Violations of Executive Order 12,291*, 1983 Duke L.J. 285, 286–87 (1982), https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=2836&context=dlj#:~:text=He%20concludes%20that%20a%20non,ous%20obstacle%20to%20judicial%20enforceability [https://perma.cc/C3SQ-NSWK].

follow their own rules."[167] Challenges to executive orders often turn on an agency's interpretation of the directive–-if the DOI does not comply, it will likely be compelled to act once it is taken to court, as the order would have explicit language.[168] Additionally, this would allow the Executive Branch to settle the dispute for water between Arizona and the Navajo Reservation in a timely manner, which is crucial, considering the aforementioned federal pipeline construction intended to bring water to the Reservation.[169] An empty pipeline—costing millions of government dollars—would be an egregious waste of taxpayer dollars. The federal government has something to lose in this dispute as well.

B. Long Term Goals for Equitable Water Dispersion

If there is to be any substantial change from the lessons learned by the Navajo Nation in their fight for accessible drinking water, there must be future investment into systemic change. This can be accomplished through an establishment of water courts in Arizona, much like in Colorado. The federal government also must step up to achieve this, by passing legislation and increasing efforts to mitigate drought in the West.

As previously mentioned, Colorado has a network of water courts that comprise the decision-making body for water disputes in the State.[170] Colorado established the courts by passing the Water Right Determination and Administration Act of 1969, which also "created explicit procedures for filing and pursuing applications and objections to applications for water rights, conditional water rights, changes of water rights, and augmentation plans."[171] This Act streamlined the process for determining water settlements and disputes, something that Arizona's water governance desperately needs. Implementation of water courts in Arizona would allow for quicker trials and negotiations and, thus, a quicker deliverance of water to the people who need it.

Arizona could easily implement water courts similar to those in Colorado because its state constitution allows for such a court, which is exemplified by its establishment of a tax court.[172] First, Arizona's state constitution grants the Superior Court original jurisdiction over "cases and proceedings in which exclusive jurisdiction is not vested by law in another court" and for "special cases and proceedings not otherwise

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167 *Id.* at 285.

168 *See* Graber, *supra* note 162.

169 Olalde et al., *supra* note 95.

170 *Water Rights*, Colo. State Univ., https://waterknowledge.colostate.edu/water-management-administration/water-rights/ [https://perma.cc/2WEU-E4AM].

171 *Id.*

172 *Superior Court*, Ariz. Jud. Branch (Jan. 27, 2024), https://www.azcourts.gov/AZ-Courts/Superior-Court [https://perma.cc/68N7-2XEJ]; Ariz. Rev. Stat. § 12-161 (2022).

provided for, and such other jurisdictions as may be provided by law."[173] As there are no other courts with existing jurisdiction over water rights, the Arizona Superior Court can establish Water Courts and be granted jurisdiction over state water rights through the legislature, if necessary.

Pursuant to its authority under the state constitution, a topic-specific court has already been established through the State Legislature in the form of the Arizona Tax Court.[174] Established in 1988, the Tax Court functions as a department within the Superior Court system and is granted "jurisdiction over all questions of law and fact relating to disputes involving the imposition, assessment or collection of Arizona taxes."[175] Therefore, it is possible for the Arizona State Legislature to establish a Water Court as a department within the Superior Court, much like how it did with its Tax Court.

While the state of Arizona has many avenues at its disposal to make their water distribution more equitable, the federal government can—and should—take action as well. The court in *Arizona v. Navajo Nation* advises the Tribe to encourage the federal government to enact "legislation that provides for water rights, access, and infrastructure while acknowledging competing demands in the water-scarce environment of the American West."[176] The federal government has begun to make strides in this direction, with legislation being drafted to improve reservation conditions and efforts being made toward drought mitigation in the West.[177] However, these measures have clearly not yet been aggressive enough to secure the Navajo Nation's water apportionment.

For instance, proposals have been circulated by members of Congress.[178] Most prominently, is the Honoring Promises to Native Nations Act, penned by Democratic Senator Elizabeth Warren.[179] The goal behind the legislation is to take the 2018 Broken Promises Report—which "documents the challenges facing Indian Country," such as poverty, violence, and poor health—seriously and implement measures to improve the concerns raised by the Report.[180] More specifically, the purpose of the bill is to "ensure progress toward the fulfillment

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173 Ariz. Const. art. VI, § 14.

174 *Superior Court*, *supra* note 172; Ariz. Rev. Stat. § 12-161 (2022).

175 *Superior Court*, *supra* note 172, at 4.

176 Schwartz & Hite, *supra* note 133.

177 Charles V. Stern & Anna E. Normand, Cong. Rsch. Serv., IF12437, Bureau of Reclamation Funding in the Inflation Reduction Act (P.L. 117-169) (2024), https://crsreports.congress.gov/product/pdf/IF/IF12437#:~:text=authorities%20receiving%20funds.-,Drought%20Mitigation,the%20Reclamation%20Act%20of%201902 [https://perma.cc/52U3-85SC].

178 Elizabeth Warren & Derek Kilmer, Honoring Promises to Native Nations Act (2019), https://www.warren.senate.gov/imo/media/doc/Honoring%20Promises%20One%20Pager%20-%2011.28.2022.pdf [https://perma.cc/3QA6-GQB3].

179 *Id.*

180 *Id.*

by the Federal Government of its trust and treaty obligations to Native Americans and Tribal governments, to ensure funding for programs for Native Americans and Tribal governments, and for other purposes."[181] The bill was introduced in the Senate in December 2022 and referred to the Senate Committee on Indian Affairs.[182] The preliminary summary includes few mentions of water, with "funding for water pollution control" and "water and waste disposal program funding."[183] While this is a good start, it is nowhere near sufficient to address the water crisis that the Navajo Nation, and other Western tribes, are facing. Additionally, with the primary purpose of compelling the United States to honor its treaty obligation, it is unclear whether that would include making a determination of water apportionments for tribes, especially following the *Arizona v. Navajo Nation* ruling stating it was beyond the scope of the treaty.[184] The bill has not resurfaced since being recommended to the Committee on Indian Affairs, but whether the resulting legislation is this bill or another bill, it should not merely be a bandage on the Navajo Nation's water crisis. Rather, it should address the functionality of the water allotment process with language explicitly advocating for centralized allocation system or boundaries on states' negotiation tactics. Any future legislation should focus on making the water allocation system fairer and more equitable to allow Tribes to secure easy access to their basic needs.

Conclusion

The Navajo Nation has implicit rights to the waters of the Colorado River Basin. The federal government and the state of Arizona have a long history of ignoring the needs of tribes, at best, and actively oppressing them, at worst. This pattern has continued with the recent Supreme Court decision, Arizona v. Navajo Nation, in which the majority refused to hold the United States to its treaty obligations under the Winters Doctrine. The Navajo Nation still has no quantified right to the Colorado River mainstream, despite having had priority water rights for over 150 years. Western water law's consistent exclusion of the Navajo must be addressed; this paper proposed both shorter-term state legislation and longer-term federal solutions to determine the Navajo Nation's rights to the river.

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181 Honoring Promises to Native Nations Act, S.5186, 117th Cong. (2022), https://www.congress.gov/bill/117th-congress/senate-bill/5186/all-info?s=1&r=79 [https://perma.cc/5J8D-NR9L].

182 *Id.*

183 Warren & Kilmer, *supra* note 178.

184 Warren & Kilmer, *supra* note 178; Arizona v. Navajo Nation, 599 U.S. at 565.

The federal government must honor its treaty obligations through legislation and the continuation of drought mitigation efforts. Arizona must look at its current water consumption and rectify the gridlock in its court system if it wants to maintain a robust and equitable water management system. This problem does not have one easy solution. If there was one, the Navajo Nation would have accomplished it already. The outcome is discouraging, but Diné remains hopeful:

> *"We will continue to drive the pace of those discussions, so we are able to secure the water needed for the vibrant Navajo Nation permanent homeland and future that our ancestors envisioned and negotiated to preserve in our treaties."*
>
> *—Navajo Nation Attorney General Ethel Branch*[185]

185 Navajo Nation Dep't of Just., *supra* note 92; if the U.S. government will not make efforts to assist one of the largest, most well-known Tribes in the country, it will only be increasingly difficult for smaller tribes in Arizona to secure their water rights. Litigation is expensive and not every tribe has the resources and expertise the Navajo Nation does. Individuals should consider donating to indigenous-run organizations, voting for indigenous representation in elections, and pressuring their local and state representation to take this issue seriously, especially if they live in the Basin states.

Sovereign Toxicity: How a Waiver of Sovereign Immunity Could Provide Prisoners Wrongfully Exposed to Toxins with a Monetary Remedy

*Farrel Murphy**

Abstract

Spanning across the United States, incarcerated individuals have spent decades being forcefully exposed to harmful and toxic environmental hazards that can cause significant and long-term adverse effects on their health. Specifically, federally incarcerated individuals are frequently housed on land known to be unsafe to the government agents carrying out the planning and construction of new federal correctional institutions. This injustice has continued to occur because of defects in both the National Environmental Policy Act ("NEPA") review process and established environmental justice guidelines. Not only has the NEPA review process failed to derail or halt the building of these toxic institutions, but the current regulatory framework also prevents individuals who have been harmed from accessing monetary relief for the damage they have suffered. To protect these individuals and further the principles of environmental justice, Congress must amend NEPA to include a provision waiving sovereign immunity and allowing for liability and a monetary damages remedy specifically for violations of NEPA and the environmental justice guidelines that result in clear environmental injustice.

Table of Contents

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Introduction

Uranium, coal ash containing "mercury, lead, arsenic, hexavalent, chromium, cadmium, boron, and thallium,"[1] and coal tar are just some of the kinds of toxic waste and hazardous substances that incarcerated individuals in the United States are regularly exposed to while serving out their sentences or awaiting the adjudication of their cases.[2] This exposure is due to the phenomena of penal institutions in America being built on environmentally compromised land suffering from contaminated soil, groundwater, and even air in some instances.[3] Often, federal government officials, specifically those working within the federal Bureau of Prisons ("BOP"), are aware of the environmental contamination present on the sites they propose as locations for new correctional complexes as evidenced by some of those locations being designated as Superfund Sites on the National Priorities List.[4] The kind of toxic exposure inmates at these complexes face has reportedly led those individuals to develop long term and often debilitating health issues ranging anywhere from infection, to vertigo, to cancers

1 Taylor Carpenter, *The Death Sentence That is America's Toxic Prisons*, 17 Ind. Health L. Rev. 229, 231 (Feb. 2, 2021).

2 *See generally id.*

3 *Id.*

4 *See e.g.* Equal Justice Initiative, *Investigation Reveals Environmental Dangers in America's Toxic Prisons,* EJI.org (June 16, 2017), https://eji.org/news/investigation-reveals-environmental-dangers-in-toxic-prisons/ [https://perma.cc/SS5Q-DQRT].

such as lymphomas.[5] For example, prisoners at a state prison in Pennsylvania that were exposed to the kinds of toxins produced by coal waste reported health concerns in staggering numbers that began after they arrived at the prison.[6] An investigation conducted by the Abolitionist Law Center found that, consistent with exposure to coal waste, "more than 81% of responding prisoners reported respiratory, throat, and sinus conditions," and "68% of responding prisoners experienced gastrointestinal problems."[7]

Forcibly subjecting individuals to environmental hazards by way of incarceration in toxic institutions raises concerns related to environmental justice, paths to enforcement, and remedies available under both the National Environmental Policy Act ("NEPA") and environmental justice guidelines put forth by the executive branch. Federal prisons and facilities designed for the incarceration of individuals within the federal criminal legal system will be the focus of this Note. Specifically, this Note will demonstrate that Congress should amend the language of NEPA and waive sovereign immunity, or the bar to lawsuits against the federal government without its consent,[8] when harm has been caused to individuals following a clear violation of NEPA or environmental justice guidelines and allow liability resulting in a monetary remedy for those violations. The proposed amendment is necessary to fill the enforcement and remedy gap created by the defects in the current regulatory framework and the path to judicial review that it provides when individuals have suffered harm due to their incarceration in toxic federal penal institutions that were known to be environmentally concerning at the time of construction.

Part I of this Note provides an overview of the regulatory, legislative, and judicial frameworks that are implicated in the design of NEPA and environmental justice guidelines generally. A broader discussion concerning environmental justice and its evolution and the relationship between that evolution and incarcerated populations is also provided. Part II of this Note discusses the problems with the NEPA framework and the design of Executive Order 12898 that prevent adequate enforcement or a path to financial compensation as a remedy for potential plaintiffs that have been harmed by BOP noncompliance resulting in incarceration on environmentally contaminated and unsafe land. Finally, Part III of this Note will examine previously proposed solutions

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5 Candice Bernd et al., *America's Toxic Prisons: The environmental injustices of mass incarceration*, Earth Island J., (Summer 2017), https://www.earthisland.org/journal/index.php/magazine/entry/americas_toxic_prisons [https://perma.cc/PEM2-Q8VN].

6 Dustin S. McDaniel et. al., No Escape: Exposure to Toxic Coal Waste at State Correctional Institution Fayette 1 (2014).

7 *Id*.

8 Erwin Chemerinsky, *Against Sovereign Immunity*, 53 Stan. L. Rev. 1201, 1202 (2001).

and conclude that a more concrete solution is needed to address this issue of environmental injustice and lack of adequate relief available to plaintiffs. Part III will also discuss the idea that the Federal Tort Claims Act ("FTCA"), discussed in Part I, can serve as an example of a successful situation in which the federal government has waived sovereign immunity in a very limited set of circumstances to fill a gap in the ability of plaintiffs to access adequate redress and compensation.[9] This example will serve to show the feasibility of a waiver of sovereign immunity in a context where plaintiffs being harmed are without an adequate remedy. Additionally, the FTCA will also serve as an example of the ability to narrowly tailor such language to restrict suits to specific circumstances that the legislature has itself contemplated and narrowed.

I. Background

A. The Connection Between Mass Incarceration and Environmental Justice

Mass incarceration has been a lasting issue in the United States since the early 1970s beginning with the "war on drugs" waged by President Richard Nixon and continued by politicians pushing "tough on crime" platforms and putting excessively punitive legislation into place,[10] such as the 1994 Crime Bill signed into law by President William J. Clinton.[11] The Crime Bill of 1994 is also known as the Violent Crime Control and Law Enforcement Act of 1994.[12] The Crime Bill generally encouraged lengthier mandatory prison sentences and put more funding in place for measures led by police and additional police and incarceration facilities themselves.[13] According to the Bureau of Justice Statistics of the U.S. Department of Justice,[14] in 2020 a total of 5,500,600

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9 *See generally* Michael Contino & Andreas Kuersten, Cong. Rsch. Serv., R45732, The Federal Tort Claims Act (FTCA): A Legal overview (2023).

10 James Cullen, *The History of Mass Incarceration: From Alexis de Tocqueville to Ronald Reagan, the forces that have shaped the current state of our prison system,* Brennan Ctr. Just. (July 20, 2018), https://www.brennancenter.org/our-work/analysis-opinion/history-mass-incarceration [https://perma.cc/C7JR-FEMP]; *see also* Steven B. Duke, *Mass Imprisonment, Crime Rates, and the Drug War: A Penological and Humanitarian Disgrace*, 9 Conn. Pub. Int. L. J. 17, 17-18 (2009).

11 Cullen, *supra* note 10; *see also* Jessica Lussenhop, *Clinton crime bill: why is it so controversial*, BBC News Servs. (Apr. 18, 2016), https://www.bbc.com/news/world-us-canada-36020717 [https://perma.cc/8U9F-PLBV].

12 Violent Crime Control and Law Enforcement Act of 1994, 18 U.S.C. §§ 1033-1034 (1994).

13 Lussenhop, *supra* note 11.

14 The Bureau of Justice Statistics describes their role in the Department of Justice as "[collecting, analyzing, and disseminating] reliable statistics on crime and justice systems in the United States, [supporting] improvements to state and local criminal justice information systems, and [participating with national and international organizations to develop and recommend national standards for justice statistics." Bureau of Just. Stat., Correctional Populations in the United States, 2020—Statistical Tables 14 (2022).

people in the United States were under the control of adult correctional services, and 1,691,600 of those people were actively incarcerated in either local jails or prisons.[15] A recent count of federal inmates in the United States provided that as of January 29, 2025, there are "142,626 federal inmates in BOP[16] Custody" and "12,514 federal inmates in other types of facilities."[17]

The penal system in the United States is openly rife with ethnic and racial inequality stemming from both modern and historic systemic oppression and racial targeting both in society generally, and law enforcement specifically.[18] Research has long shown that individuals experiencing poverty and racial minority groups in the United States are subjected to incarceration at "disproportionately high rates."[19] Studies suggest Latino and Black men experience disparities in incarceration at even higher rates than other areas of exposure within the criminal legal system.[20] The groups most targeted and impacted by the policies that have led to mass incarceration in the United States, and have therefore faced higher rates of incarceration, represent the same populations and communities in the United States that President Clinton's Executive Order 12898 was designed to protect.[21]

Executive Order 12898 requires federal agencies to "make achieving environmental justice part of [their] mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States."[22] The exposure of prisoners to toxic substances poses increased

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15 *Id.* at 4.

16 BOP is the Federal Bureau of Prisons. The Federal Bureau of Prisons is "responsible for the custody and care of federal inmates." *About Our Agency,* Fed. Bureau of Prisons, https://www.bop.gov/about/agency/ [https://perma.cc/4CFV-AGTC]; the BOP is a component of the U.S. Justice Department. *See* J.W. Roberts, *Federal Bureau of Prisons: Its Mission, Its History, and Its Partnership with Probation and Pretrial services*, 61 Fed. Probation J. 53, 53 (1997).

17 *Population Statistics,* Fed. Bureau of Prisons (Jan. 29, 2025), https://www.bop.gov/mobile/about/population_statistics.jsp#:~:text=158%2C192%20Total%20Federal%20Inmates&text=Last%20Updated%20November%2016%2C%202023,Thursday%20at%2012%3A00%20A.M [https://perma.cc/2JN7-8T9F].

18 Ashley Nellis, *Mass Incarceration Trends,* Sent'g project (Jan. 25, 2023), https://www.sentencingproject.org/reports/mass-incarceration-trends/ [https://perma.cc/A6TG-KC7E].

19 Christopher Muller & Alexander F. Roehrkasse, *Racial and Class Inequality in US Incarceration in the Early Twenty-First Century*, 101 Soc. Forces 803, 803-804 (December 10, 2021).

20 Becky Pettit & Carmen Gutierrez, *Mass Incarceration and Racial Inequality*, 77 Am. J. Econ. Socio. 1153, 1157 (Oct. 29, 2018).

21 *See generally* Ashia Ajani, *Reframing Environmental Racism as a Form of Criminalization: Actualizing Critical Environmental Justice*, Yale Env't Rev. (Dec. 1, 2021), https://environmentreview.yale.edu/reframing-environmental-racism-form-criminalization-actualizing-critical-environmental-justice [https://perma.cc/PC4H-S4UY]; Exec. Order No. 12,898, 59 Fed. Reg. 32 (Feb. 16, 1994).

22 Exec. Order No. 12,898, 59 Fed. Reg. 32 (Feb. 16, 1994).

environmental justice concerns because historically marginalized and oppressed minority groups facing the greatest impact from the United States system of mass incarceration similarly "bear the brunt of environmental racism in their communities."[23]Additionally, "because it is the same communities that are impacted first and worst by the criminal justice system and environmental injustices, it is vital to consider how these two systems overlap."[24] Despite this, the environmental impact on individuals who are incarcerated is not typically considered in the current environmental review process of federal projects.[25]

President Clinton signed Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," into law on February 11, 1994.[26] This Executive Order is considered a "landmark Order" in the field of environmental justice,[27] and was the "first major federal action on environmental justice."[28]

President Clinton issued Executive Order 12898 in response to the phenomena that in the United States low-income and minority households faced greater environmental impact than "non-Hispanic whites and higher-income households," which had been supported by extensive research into the issue.[29] One goal of Executive Order 12898 was to attempt to mitigate the disproportionate environmental harm historically propounded on minority and impoverished communities.[30]

In response to long-standing criticism of Executive Order 12898's lack of strength to encourage agency compliance with the ideals set forth in the order, President Joseph R. Biden signed Executive Order

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23 Sonal Jessel & Bobbi Wilding, Environmental Justice, Health, and Carceral Facilities 6 (July 2021).

24 *Id.*

25 *E.g.* Equal Justice Initiative, *supra* note 4.

26 Exec. Order No. 12,898, 59 Fed. Reg. 32 (Feb. 16, 1994).

27 The Environmental Protection Agency defines "environmental justice" as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work." *Environmental Justice,* Env't Prot. Agency, https://www.epa.gov/environmentaljustice [https://perma.cc/X33K-9U6J].

28 *The 20th Anniversary of President Clinton's Executive Order 12898 on Environmental Justice,* Nat. Res. Def. Council (Feb. 10, 2014), https://www.nrdc.org/bio/albert-huang/20th-anniversary-president-clintons-executive-order-12898-environmental-justice [https://perma.cc/2DZ2-BVEL].

29 Hilary L. Zarin, Environmental Justice, Before and After Executive Order 12898: What are agencies doing, how well are they doing it, and what else can be done? at 1-2 (2016).

30 *Id*. at 2.

14096 into law on April 21, 2023.[31] President Biden's Executive Order, "Revitalizing Our Nation's Commitment to Environmental Justice for All," sought to expand the policies and goals behind President Clinton's Executive Order 12898 by providing more clear guidance to federal agencies on how to implement environmental justice principles without sacrificing their ability to carry out their duties under the current statutory framework, including duties associated with the NEPA framework.[32]

B. The Regulatory Framework of NEPA

NEPA,[33] at the time it was enacted by Congress in 1969[34] and signed into law in 1970 by President Nixon, was the first significant and most comprehensive legislation aimed at addressing environmental issues through the lens of environmental law within the United States that had ever been introduced or enacted.[35] NEPA has even been referred to as "the 'Magna Carta' of Federal environmental laws."[36] While most environmental legislation passed around the same time as NEPA was specific and "complex," NEPA itself "was short, simple, and comprehensive."[37] NEPA not only codified a policy of environmental protection on a national scale and established the Council on Environmental Quality ("CEQ"), but it also "required that environmental impact statements be prepared for major federal actions having a significant effect on the environment."[38]

NEPA sets forth an environmental review process that federal agencies are expected to undertake when they launch a major federal project.[39] The three types of analysis that can occur under the NEPA review process are a (1) Categorical Exclusion determination

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31 Hannah Perls, *President Biden Issues Long-Awaited Update to Clinton-era Environmental Justice Executive Order*, Harvard L. Sch. Env't & Energy L. Program (Aug. 3, 2023), https://eelp.law.harvard.edu/biden_ej_order_update/ [https://perma.cc/ABN8-5KSS].

32 *Id.*

33 National Environmental Policy Act, 42 U.S.C. §§ 4321-4370h (1969).

34 Nicholas C. Yost, *The Background and History of NEPA*, *in* The NEPA Litig. Guide 1, 1-2 (Albert M. Ferlo et al., eds., 2nd ed. 2012).

35 *Id.*

36 *Welcome*, Nat'l Env't Pol'y Act (Feb. 26, 2025), https://ceq.doe.gov/#:~:text=President%20Nixon%20signed%20the%20National,)%2C%20and%20for%20other%20purposes [https://perma.cc/S5MG-PZTC].

37 Alvin L. Alm, *NEPA: Past, Present, and Future*, 14 EPA J. 32, 32 (1988), https://heinonline.org/HOL/Page?collection=journals&handle=hein.journals/epajrnl14&id=33&men_tab=srchresults [https://perma.cc/Y4RE-LGUD].

38 *Id.*

39 *National Environmental Policy Act Review Process,* Env't Prot. Agency (July 15, 2024), https://www.epa.gov/nepa/national-environmental-policy-act-review-process [https://perma.cc/LM9U-VG7F].

("CATEX"), (2) Environmental Assessment/Finding of No Significant Impact ("EA/FONSI"), and (3) Environmental Impact Statement ("EIS").[40] This Note will focus primarily on the process surrounding EISs under NEPA as the decision to build a new federal prison facility is a significant federal project decision that is generally expected to require an EIS before construction and planning can move forward.[41] The purpose of drafting an EIS under NEPA is to require the federal agency to analyze "the environmental impact of each of the proposed actions and range of alternatives."[42] The NEPA EIS process also provides an opportunity for public comment before the final EIS is drafted and a decision on how to move forward is made by the drafting agency.[43] Additionally, the Environmental Protection Agency ("EPA") serves as a voice for feedback on the agency's environmental analysis, but NEPA's current mandate is only concerned with informed discretionary decision-making as opposed to the most environmentally conscious decision-making.[44]

C. The Regulation of Toxic Sites

One relevant environmental factor when considering the construction of a federal project may be the land itself, specifically an area of land's designation as a Superfund Site and the redevelopment of those sites.[45] The term Superfund Site comes from the Hazardous Substance Superfund Trust Fund, which is the trust fund established by Congress in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA").[46] CERCLA was enacted following public concern about environmentally contaminated land and the risk those kinds of sites posed to the environment and the public in

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40 *Id.*

41 28 C.F.R. § 61, App. A

42 Tiffany Middleton, *What is an Environmental Impact Statement?*, Am. Bar Ass'n (Mar. 2, 2021), https://www.americanbar.org/groups/public_education/publications/teaching-legal-docs/teaching-legal-docs--what-is-an-environmental-impact-statement-/ [https://perma.cc/5WKH-D44P].

43 Council on Env't Quality, A Citizen's Guide to the National Environmental Policy Act 14-15, https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5310825.pdf [https://perma.cc/BEG3-8X39].

44 *Id.* at 6, 15.

45 *See generally Superfund Redevelopment Basics,* Env't Prot. Agency (June 12, 2024), https://www.epa.gov/superfund-redevelopment/superfund-redevelopment-basics [https://perma.cc/D8AA-UCUU].

46 David M. Bearden, Cong. Rsch. Serv., R41039, Comprehensive Environmental Response, Compensation, and Liability Act: A Summary of Superfund Cleanup Authorities and Related Provisions of the Act 1 (2012).

the 1970s.[47] The CERCLA legislation implemented three major changes related to severely contaminated sites within the United States. It (1) "established prohibitions and requirements concerning closed and abandoned hazardous waste sites," (2) "provided for liability of persons responsible for releases of hazardous waste at these sites," and (3) "established a trust fund to provide for cleanup when no responsible party could be identified."[48]

As part of CERCLA's mandate, the EPA was ordered to establish and update a list of contaminated sites, known as the National Priorities List ("NPL") "to identify the most hazardous sites for the purpose of prioritizing cleanup actions."[49] Sites listed on the NPL "are eligible for extensive, long-term cleanup action" governed by CERCLA regulatory framework.[50] These prioritized sites are typically referred to as Superfund Sites.[51] A number of contaminants that can harm both the environment and the health of the human population of the area can be found at Superfund Sites, including, but not limited to, lead, asbestos, dioxins,[52] and radiation.[53] Superfund Sites can range from abandoned landfills to chemical plants that are no longer in use.[54] Data available as of 2010 provided that "at least 589 federal and state prisons are located within three miles of a Superfund cleanup site on the National Priorities List, with 134 of those prisons located within just one mile."[55]

D. The Limiting Power of Sovereign Immunity

Litigation against the United States government is generally handled in a very different context than litigation against a private

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47 *What is Superfund?*, Env't Prot. Agency (Oct. 8, 2024), https://www.epa.gov/superfund/what-superfund [https://perma.cc/VCY3-FP44].

48 *Superfund: CERCLA Overview*, Env't Prot. Agency (Oct. 8, 2024), https://www.epa.gov/superfund/superfund-cercla-overview [https://perma.cc/BV87-FYNR].

49 Bearden, *supra* note 46 at summary.

50 *Site Remediation Program*, N.J. Dep't of Env't Prot. (Jan. 31, 2013), https://www.nj.gov/dep/srp/superfund/sf_faq.htm [https://perma.cc/F43P-U2RB].

51 *See generally* Anna Saclamogna et al., *A Nationwide Cleanup,* Nat'l Geographic, https://www.nationalgeographic.com/superfund/ [https://perma.cc/4FQL-KHUM].

52 Dioxins are defined as "a group of chemicals that form as unwanted byproducts from incomplete burning of household and industrial waste. They can also be produced during bleaching of paper pulp and the manufacturing of chlorinated chemicals like polychlorinated biphenyls (PCBs), chlorinated phenols, chlorinated benzene, and certain pesticides." *Dioxins,* Ill. Dep't of Pub. Health, https://dph.illinois.gov/topics-services/environmental-health-protection/toxicology/hazardous-substances/dioxins.html [https://perma.cc/262E-MLV5].

53 *Contaminants at Superfund Sites,* Env't Prot. Agency (Nov. 21, 2016), https://19january2017snapshot.epa.gov/superfund/contaminants-superfund-sites_.html [https://perma.cc/H892-PFD7].

54 Mary Schons, *Superfund,* Nat'l Geographic Educ. (Nov. 15, 2024), https://education.nationalgeographic.org/resource/superfund/# [https://perma.cc/4PAQ-636J].

55 Bernd et al., *supra* note 5.

individual.[56] This is because the federal government's liability is generally limited, and the procedures for adjudicating matters where the government acts as the defendant present unique circumstances and defenses.[57] One of the most entrenched limitations on the liability of the federal government throughout the history of the United States has been the principle of sovereign immunity.[58] The principle of sovereign immunity is "the immunity of the government from suit without its express permission."[59] In line with this concept the United States Supreme Court has routinely held that consent is a prerequisite to bringing suit against the federal government.[60] Only Congress itself may issue this consent and such an issuance is known as a waiver of the sovereign immunity of the United States government.[61] Thus, lawsuits against the federal government face far greater barriers than an average lawsuit between private individuals.

A congressional waiver of sovereign immunity is quite rare, but Congress has waived sovereign immunity on several specific narrowly-tailored issues including "claims against the federal government for Fifth Amendment takings of private property, for tort claims, and for final agency actions" as well as "general stream adjudications in state courts."[62] The congressional waiver of sovereign immunity for final agency actions is contained within the Administrative Procedure Act ("APA") at 5 U.S.C. § 702, and it provides that

> an action in a court of the United States seeking relief other than monetary damages and stating a claim that an agency or an officer or employee thereof acted or failed to act in an official capacity or under color of legal authority shall not be dismissed nor relief therein be denied on the ground that it is against the United States or that the United States is an indispensable party. The United States may be named as a defendant in any such action, and a judgement or decree may be entered against the United States.[63]

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56 Gregory C. Sisk, A Primer on the Doctrine of Federal Sovereign Immunity, 58 Okla. L. Rev. 439, 439-440 (2005).

57 *Id.* at 440.

58 *See generally* Cong. Rsch. Serv., *Suits Against the United States and Sovereign Immunity*, Constitution Annotated, https://constitution.congress.gov/browse/essay/artIII-S2-C1-13-4/ALDE_00013569/ [https://perma.cc/EWR5-4Q2L].

59 Sisk, *supra* note 56, at 440.

60 Cong. Rsch. Serv., *supra* note 58.; *see also* United States v. Mitchell, 463 U.S. 206, 212 (1983) (holding "it is axiomatic that the United States may not be sued without its consent and that the existence of consent is a prerequisite for jurisdiction.").

61 Cong. Rsch. Serv., *supra* note 58.

62 Sandra B. Zellmer, *Waiving Federal Sovereign Immunity in Original Actions Between States*, 53 U. Mich. J. L. Reform 447, 449 (2019).

63 5 U.S.C. § 702 (1976).

It is important to note that this waiver of sovereign immunity specifies that it applies only to non-monetary relief meaning a damages remedy is not available in this context.[64] Consequently, this provides that a challenge to final federal agency decisions, such as those made by the BOP concerning whether to construct a federal correctional facility or where to place such a project, would only be subject to injunctive or declaratory relief as opposed to any form of monetary relief.[65]

Providing an example of a waiver of sovereign immunity which created an avenue for obtaining monetary relief, in 1946 Congress passed the Federal Tort Claims Act ("FTCA") which "allows plaintiffs to file and prosecute certain types of tort lawsuits against the United States in federal court, with the potential of recovering financial compensation from the federal government."[66] The FTCA does not provide a potential solution to the problem presented in this Note due to its "Discretionary Function Exception" at 28 U.S.C. § 2680(a), which exempts

> any claim based upon an act or omission of an employee of the Government, exercising due care, in the execution of a statute or regulation, whether or not such statute or regulation be valid, or based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or an employee of the government whether or not the discretion involved be abused.[67]

However, it does serve as an example of a successful instance where Congress waived sovereign immunity and created a damages remedy based on lack of availability elsewhere to plaintiffs.

Plaintiffs bringing claims under the FTCA have been successful in winning monetary judgements from the government in multiple areas of tort law.[68] Specifically, medical malpractice claims and "traffic" claims seem to be the most common FTCA claims alongside a host of other miscellaneous torts.[69] Attorneys that bring lawsuits for plaintiffs under the FTCA seem to focus mostly on the areas of medical malpractice, premises liability, and vehicular accidents leading to torts involving the

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64 *Id.*

65 Kristen Hite, Cong. Rsch. Serv., IF11932, National Environmental Policy Act: Judicial Review and Remedies (2021).

66 Contino & Kuersten, *supra* note 9, at 1.

67 28 U.S.C. § 2680 (2011).

68 *See generally Judgement Fund: Annual Report to Congress,* FiscalData (Dec. 19, 2024), https://fiscaldata.treasury.gov/datasets/judgment-fund-report-to-congress/judgment-fund-annual-report-to-congress [https://perma.cc/TZA2-T48V].

69 *Id.*

federal government or its agents.[70] Lawsuits in FTCA claims have provided injured plaintiffs with millions of dollars in damages for harm suffered at the hands of government actors working within the scope of their positions.[71]

Mouton v. United States and *Jackson v. United States* both provide illustrative examples of cases in which plaintiffs have been successful in seeking monetary damages from the federal government under the FTCA.[72] In *Mouton v. United States*, a private motorist and a United States Federal Aviation Administration ("FAA") employee acting in his official capacity collided on a Louisiana highway, which resulted in a neck injury to the private motorist.[73] The private motorist was awarded damages in the amount of $88,921.00 to be paid by the federal government for the FAA employee's negligence in the car crash.[74] In *Jackson v. United States*, the plaintiffs, the injured party and his wife, were awarded a collective amount of $5,712,402 in damages to be paid by the federal government in their FTCA claim.[75] This amount was awarded via an FTCA suit after doctors at a Veterans Affairs hospital in Missouri negligently failed to diagnose the plaintiff with prostate cancer, ultimately causing him great injury.[76] These cases show the FTCA has successfully provided harmed plaintiffs in need of redress with an avenue to obtain monetary damages from the federal government.

State tort law generally governs FTCA claims as the FTCA itself simply waived sovereign immunity in situations where a state cause of action in tort would otherwise exist in a particular state had the actor not been an agent of the federal government.[77] 28 U.S.C. § 1346(b) provides that damages can be recovered from the federal government "under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred."[78] Toxic tort litigation is a type of tort

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70 *E.g.*, *Nationwide Federal Tort Claims Act Attorneys*, Nat'l Trial L., https://www.nationaltriallaw.com/federal-tort-claims-attorneys/ [https://perma.cc/X3SK-Y9BS]; *Federal Tort Claims Act Results*, Levin & Perconti, https://www.levinperconti.com/successful-cases/federal-tort-claims/ [https://perma.cc/GZH8-688K].

71 *See generally Personal Injury Lawsuits Against Federal Government,* Miller & Zois, https://www.millerandzois.com/practice-areas/personal-injury-federal-government/ [https://perma.cc/URN3-PCFV] (an overview of how to file a claim under the FTCA and examples of successful claims).

72 Mouton v. United States, No. 6:18-CV-00484, 2020 U.S. Dist. LEXIS 70508 (W.D. La. Apr. 21, 2020); Jackson v. United States, No. 1:18 CV 9 ACL, 2019 U.S. Dist. LEXIS 223419 (E.D. Mo. Dec. 30, 2019).

73 *Mouton*, 2020 U.S. Dist. LEXIS 70508, at *2, *34.

74 *Id.* at *39.

75 Jackson, 2019 U.S. Dist. LEXIS 223419, at *52.

76 *See id.* at *1–3.

77 *See* Contino & Kuersten, *supra* note 9, at 6.

78 Federal Tort Claims Act, 28 U.S.C. § 1346(b).

litigation that serves to compensate individuals injured by negligent or wrongful exposure to unsafe substances at the hands of another responsible party.[79] Attorneys in both California and Colorado, states home to the two federal prisons discussed below, advertise services in bringing toxic tort claims for plaintiffs that have been injured by toxic exposure.[80] Based on these advertisements both states clearly entertain toxic tort lawsuits between private individuals. Therefore, it seems clear based on the information related to the FTCA and state law above that, if not for the discretionary function exception to the FTCA, prisoners injured by negligent exposure to toxic substances at the hands of the BOP could sue and obtain monetary damages under the FTCA.

II. When Legislation Fails to Protect

A. NEPA's Enforceability Issue

Despite NEPA's numerous, lengthy, and complex processes for review of proposed federal projects, and the legislation's requirement that federal agencies act in ways that create positive outcomes for both the environment and the people living in that environment,[81] it consists of only guidelines subject to agency discretion,[82] and not mandates, which has allowed federal agencies to perpetuate issues of environmental injustice in their decision-making related to federal projects. Specifically, this Note posits that the BOP, has exploited the discretionary nature of NEPA to incarcerate individuals on unsafe land without taking into consideration the impact the environment may have on those individuals. In 1930, Congress created the Federal BOP, which currently operates as part of the organizational scheme of the U.S. Department of Justice and is tasked with holding or housing federal inmates both pre and post-conviction.[83] Given the BOP's operating status under a federal agency, its decision making process regarding federally funded projects that could potentially impact the environment is subject to the NEPA review process.[84] As prescribed by the Department of Justice's "Procedures for Implementing the National Environmental Policy Act," the

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79 *See* Christy Bieber, *What is a Toxic Tort?*, Forbes Advisor (Apr. 5, 2023, 4:59 AM), https://www.forbes.com/advisor/legal/personal-injury/toxic-tort/ [https://perma.cc/63UA-VD7G].

80 *See Toxic Tort Claims in California*, Enjuris, https://www.enjuris.com/california/premises-liability/toxic-chemical-exposure/ [https://perma.cc/X6M5-2HYG]; *Toxic Tort Attorney*, Wool Trial L., https://wooltriallaw.com/toxic-torts/ [https://perma.cc/P376-FTLQ].

81 National Environmental Policy Act, 42 U.S.C. § 4321 (1969).

82 *See* Council on Env't Quality, *supra* note 43, at 5.

83 *See* J.W. Roberts, *Federal Bureau of Prisons: Its Mission, Its History, and Its Partnership with Probation and Pretrial services*, 61 Fed. Probation J. 53, 53 (1997).

84 *See generally* 28 C.F.R. § 61, App. A

process of building a new federal prison is a BOP action which typically requires an EIS.[85]

NEPA has specifically stated that federal agencies shall do everything practicable to "assure for all Americans safe, healthful, productive and esthetically pleasing surroundings" and "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences." [86] In defiance of these goals, the BOP has never been required to, nor has it chosen to, account for the possible adverse health effects and other types of negative impacts that unsafe environmental conditions may cause to individuals within its custody, and that information is often omitted in drafting EISs for the construction of new facilities.[87] Additionally, EPA representatives have previously explained that prisoners are not considered under environmental justice guidelines because the EPA's analysis relies on census data, which does not include prisoners.[88] This provides yet another barrier to achieving the goals of the environmental justice guidelines.

The NEPA framework lacks adequate enforcement power because it limits judicial review and does not allow for adequate remedies for injured parties.[89] NEPA lacks any kind of provision permitting judicial review or specifying the types of remedies available under it for agency noncompliance.[90] Because this leaves the NEPA review process subject only to the kind of judicial review permitted by the APA and its waiver of sovereign immunity, remedies for noncompliance or inadequate compliance with the NEPA review process are limited in scope.[91] Specifically, only injunctive or declaratory relief are available remedies as monetary damages are not an available remedy under the APA's waiver of sovereign immunity.[92] When a remedy is appropriate in a NEPA lawsuit, "courts have recognized that vacatur is the 'ordinary' remedy" because of the APA's instruction that a "court 'set aside'… the agency's action" "when a court finds that an agency violated the APA."[93] A remedy of vacatur means that "the agency's original decision is declared void and

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85 *Id*.

86 National Environmental Policy Act, 42 U.S.C. §§ 4331(b)(2)-(3) (1969).

87 Jessa Webber, *Sitting Ducks and Title VI of the Civil Rights Act: Preventing the Siting of New Prisons Near Harmful Pollutants*, 36 Notre Dame J.L. Ethics & Pub. Pol'y. 826, 835 (2022).

88 Env't Prot. Agency, Draft EJ 2020 Action Agenda Framework Compilation of Public Comments 161-73 (2015).

89 Hite, *supra* note 65.

90 *Id.*

91 *Id.*

92 *Id.*

93 Kristen Hite, Cong. Rsch. Serv., R47205, Judicial Review and the National Environmental Policy Act of 1969 9 (2022), https://crsreports.congress.gov/product/pdf/R/R47205 [https://perma.cc/XAZ2-XMV2].

ineffective."[94] However, courts have sometimes utilized the remedy of "remand without vacatur" which instead provides the agency with time to come into compliance with NEPA regulations.[95] Legal scholars have questioned the use of such a remedy as it appears to be inconsistent with the procedure prescribed by the APA for violations of NEPA.[96]

When a plaintiff in NEPA litigation challenges the analysis conducted in an EIS arguing that "the agency failed to consider certain impacts or failed to fully consider the weight of the impacts reviewed," the role left to the court is to "review the agency's NEPA analysis to determine whether the agency's decision was arbitrary or capricious under the APA."[97] The Supreme Court in *Robertson v. Methow Valley Citizens Council* held in this context, "if the adverse environmental effects of the proposed action are adequately identified and evaluated, the agency is not constrained by NEPA from deciding that other values outweigh the environmental costs. . . . NEPA merely prohibits uninformed—rather than unwise—agency action."[98] The court's lack of enforcement power in furthering the goals of NEPA, especially as they relate to environmental justice, under this judicial review framework leaves potential plaintiffs whose health was, is, or may be at risk without an adequate mechanism to seek enforcement of NEPA regulations.

Plaintiffs seeking injunctive rather than declaratory relief must meet specific tests outlined by the Supreme Court.[99] In the case of *Winter v. NRDC, Inc*. the Court provided guidance concerning what a plaintiff must show to be granted a preliminary injunction, including that "he is likely to succeed on the merits, that he is likely to suffer irreparable harm in the absence of preliminary relief, that the balance of equities tips in his favor, and that an injunction is in the public interest."[100] The Court in *Monsanto Co. v. Geertson Seed Farms* re-established that

> A plaintiff seeking a permanent injunction…must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.[101]

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94 *Id.*

95 *Id.*

96 *Id.*

97 Hite, *supra* note 65.

98 Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350-351 (1989).

99 *See generally* Hite, *supra* note 65.

100 555 U.S. 7, 20 (2008).

101 561 U.S. 139, 156-157 (2010) (quoting *eBay Inc. v. MercExchange, L. L. C.*, 547 U.S. 388, 391 (2006)).

Even if a plaintiff can surpass the numerous hurdles set out by the process outlined above and is granted declaratory or injunctive relief, these remedies are generally only beneficial before a federal prison has been built on contaminated land, in that they may slow or prevent its construction. However, they provide little benefit to plaintiffs who have already been sick or injured and need financial compensation to deal with those harms.

The judicial review process for agency non-compliance with the NEPA review guidelines leaves incarcerated individuals who have suffered harm without a remedy that would allow them to gain monetary compensation to help offset or deal with those harms. Those individuals are left entirely without an adequate remedy due to NEPA's failure to address the method of judicial review or remedies available for violations or noncompliance causing those issues to fall to the APA procedure. This regulatory framework and the resulting judicial review process creates a gap in the availability of methods of enforcement and monetary relief available under NEPA to inmates in federal custody who have suffered harm to their health due to being incarcerated in locations where they have been exposed to toxins and which the BOP knew to be environmentally unsound.

B. Executive Orders with No Force

The environmental justice guidelines set forth in President Clinton's Executive Order 12898 ("E.O. 12898") have even less enforcement power than the guidelines set forth in the NEPA review process, as E.O. 12898 itself explicitly limits any right to judicial review or enforcement of the guidelines it puts forth.[102] Section 6-609 of E.O. 12898 states,

> this order is intended only to improve the internal management of the executive branch and is not intended to, nor does it create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any person. This order shall not be construed to create any right to judicial review involving the compliance or noncompliance of the United States, its agencies, its officers, or any other person with this order.[103]

President Biden's Executive Order 14096 ("E.O. 14096") provides a similar disclaimer in Section 11, stating, "this order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents,

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102 Exec. Order No. 12,898, 59 Fed. Reg. 32 (Feb. 16, 1994).

103 *Id.*

or any other person."[104] Courts are overall reluctant to address enforcement of the environmental justice guidelines set forth in E.O. 12898 because the language of the order itself suggests it does not warrant any kind of judicial review or create any new rights.[105] Because of the language contained within the orders, the policies set forth originally by President Clinton in E.O. 12898 and reaffirmed by President Biden 29 years later in E.O. 14096 still lack legally binding enforceable mandates on federal agencies to comply and a damages remedy for those harmed by a total lack of compliance or inadequate compliance. President Biden's calls for increased accountability and transparency on the part of the federal government concerning the actions it undertakes and the relationship between those actions and issues of environmental justice[106] have not been answered, and will not be answered, unless concrete changes are made to the legislation itself.

C. Lack of Environmental Justice Challenges Under NEPA and EJ EOs

Despite the high frequency at which NEPA is litigated, environmental justice analysis is not usually a factor in that litigation due to "the lack of any statutory mandate for agencies to consider environmental justice."[107] Additionally, when these claims do reach the courts, they generally fail under the current framework of judicial review prescribed by Congress under the APA.[108] For the reasons outlined above, the current regulatory framework and procedure for judicial review in place under NEPA and E.O. 12898 are clearly not adequate in providing methods for enforcement or monetary remedies to inmates incarcerated on toxic land as a consequence of inadequate compliance with the policies outlined in NEPA and E.O. 12898. A more concrete solution and legislative change are needed to improve the regulatory framework under NEPA and the environmental justice executive orders as well as the judicial review and remedy providing processes. This change is necessary to make enforcement easier and increase the availability of monetary remedies for non-compliance with NEPA and environmental justice guidelines.

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104 Exec. Order No. 14,096, 88 Fed. Reg. 80 (Apr. 26, 2023).

105 Nina M. Hart & Linda Tsang, Cong. Rsch. Serv., LSB10590, Addressing Environmental Justice Through NEPA 4 (2021).

106 Exec. Order No. 14,096, 88 Fed. Reg. 80 (April 26, 2023).

107 Hart & Tsang, *supra* note 105, at 4.

108 *Id.*

D. The Failings of NEPA and E.O. 12898 Enforcement: Two Examples

The failure of the BOP and the EPA to consider prisoners and their position within the environmental justice analysis when evaluating the potential environmental impact of a project to construct a new federal correctional institution has resulted in the construction and continued operation of federal prisons on environmentally unsound and potentially hazardous sites.[109] Individuals subjected to incarceration in these institutions are likely exposed to toxins and other unsafe substances that could be detrimental to their health and well-being and cause permanent bodily harm.[110] Two of the federal correctional institutions that are illustrative of this environmental injustice are FCC Victorville and ADX Florence.

The Victorville Federal Correctional Complex is home to a number of penal facilities sitting within the boundary of San Bernadino County, California.[111] In 2004, the BOP opened FCC Victorville to house individuals in federal custody.[112] As of January 18, 2024, 4,132 individuals are currently incarcerated in a federal correctional facility within FCC Victorville.[113] The correctional complex now home to those inmates was built on compromised land that once housed George Air Force Base, a military base used primarily for weapons storage associated with hazardous substances.[114] The compromised nature of the land is evidenced by the EPA's designation of the area as Superfund Site CA2570024453, a site on the EPA monitored National Priorities List.[115] Superfund Site CA2570024453 is known to be contaminated with "33 hazardous chemicals, including plumes of spent jet fuel and trichloroethylene, an industrial solvent used to degrease planes," which can cause injury to major organs and is known to have caused cancer in animals.[116] Large numbers of both individuals housed on the George Air Force Base and individuals later incarcerated on the same land reported "lingering,

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109 Bernd et al., *supra* note 5.

110 *See generally* Carpenter, *supra* note 1.

111 *USP Victorville*, Fed. Bureau of Prisons, https://www.bop.gov/locations/institutions/vip/ [https://perma.cc/XUE7-7ENV].

112 Scott Schwebke & Beau Yarbrough, *Victorville prison where immigrant detainees held built atop toxic Superfund site,* The Sun (Nov. 23, 2018, 11:05 AM), https://www.sbsun.com/2018/08/13/victorville-prison-where-immigrant-detainees-held-built-atop-toxic-superfund-site/ [https://perma.cc/68LN-5ZZS].

113 *Population Statistics*, *supra* note 17.

114 Schwebke & Yarbrough, *supra* note 112.

115 *Superfund Site: George Air Force Base Victorville, CA*, Env't Prot. Agency (last visited Feb. 27, 2025, 2:13 PM), https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.docdata&id=0902737 [https://perma.cc/H8A4-QT5X].

116 Schwebke & Yarbrough, *supra* note 112.

debilitating medical problems."[117] The "contaminants of concern" were found in both the groundwater and the soil at the Superfund Site in Victorville.[118] Despite the EPA's recognition of harmful toxins at the Victorville site and the goals of the NEPA process outlined above, the federal BOP project to construct FCC Victorville was not adequately prevented by the NEPA review process or environmental justice guidelines.

ADX Florence, or the Florence Federal Correctional Complex, provides another clear example of a federal correctional compound built on land known to the federal government to be environmentally compromised at the time the project was carried out and construction commenced.[119] The Florence Federal Correctional Complex sits in close proximity to the site of the former Cotter Uranium Mill, which housed radioactive waste from chemicals such as "uranium, vanadium, and molybdenum."[120] The Cotter Uranium Mill in Canon City, Colorado is otherwise known as Superfund Site COD042167858 on the EPA's National Priorities List.[121] Regular uranium exposure can cause major health problems such as "non-malignant respiratory disease (fibrosis, emphysema) and . . . nephrotoxicity" and "[a]dditional health effects involving the reproductive/developmental systems and indicating potential neurologic effects from uranium exposure have been reported at higher doses in the literature."[122] Despite these environmental dangers, the Florence Correctional Complex now houses 2,518 individuals in federal BOP custody and remains an active penal institution today.[123]

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117 *Id.*

118 U.S. Army Corps of Eng'rs, Pre-draft Record of Decision Operable Unit No. 2 George Air Force Base California (1992).

119 The land home to the former Cotter Uranium Mill was added to the National Priorities List maintained by the EPA in 1984. *See* Env't Prot. Agency, Third Five-Year Review Report For Operable Unit 2—Lincoln Park Soils of the Lincoln Park Superfund Site Fremont County, Colorado 8 (2017). The ADX Florence Correctional Complex was built in 1994, and this ten-year gap would suggest that the BOP had adequate notice of the land's contamination status. *See* Ed Pilkington, *ADX Florence Supermax Prison: The Alcatraz of the Rockies*, The Guardian (Apr. 10, 2012), https://www.theguardian.com/world/2012/apr/10/abu-hamza-isolation-supermax-prison [https://perma.cc/N2Q8-N2N7].

120 Carpenter, *supra* note 1, at 235.

121 *Superfund Site: Lincoln Park Canon City, CO Site Documents and Data*, Env't Prot. Agency, https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.docdata&id=0800115 [https://perma.cc/SG3N-3FB2].

122 *What are the Physiological Effects of Uranium Exposure?*, Agency for Toxic Substances & Disease Registry (May 26, 2023), https://archive.cdc.gov/#/details?q=dr.cdc.gov/csem/uranium/physiological_effects.html&start=0&rows=10&url=https://www.atsdr.cdc.gov/csem/uranium/physiological_effects.html [https://perma.cc/8NMR-F3P9].

123 *Population Statistics*, *supra* note 17.

The BOP was aware of the contamination from the former uranium mill at the time the project was proposed as evidenced by the fact that "the prison's own 1989 environmental impact statement noted that the Arkansas River, ADX's main water source, was 'subject to pollution which could render its water supply unusable.'"[124] For years, individuals incarcerated at ADX Florence, such as Raymond Luc Levasseur, who watched several similarly incarcerated friends at ADX Florence suffer from tumors, skin issues, and even untimely death, have noted impacts on inmate health they believe to be caused by the contaminated land and water.[125] They have also voiced their concerns relating to being forcefully confined on land known to be environmentally unsound.[126] Much like FCC Victorville, as evidenced by its continued use as a functioning federal correctional complex today, the ADX Florence BOP project was able to successfully move forward through the NEPA review process and past environmental justice guidelines despite the known environmental dangers that would be posed to individuals incarcerated at the facility.[127]

While the federal correctional complexes mentioned above are not the only examples of penal facilities built on environmentally unsound land,[128] they serve as prime examples of the lack of adequate strength of the NEPA review process and environmental justice guidelines in preventing environmental harm that may come to incarcerated populations via federal projects, specifically those undertaken by the BOP. As evidenced through these examples, a solution undertaken with the goal of giving NEPA and the environmental justice guidelines more enforcement power, especially within the context of environmental justice, is needed. Specifically, an amendment to NEPA waiving sovereign immunity and allowing for a damages remedy for violations implicating environmental justice concerns is needed to provide plaintiffs with an adequate path to redress.

III. Solutions: A Need for Amended Law

To close the enforcement and remedy gap existing under the current regulatory and procedural framework for both NEPA and the environmental justice executive orders, Congress must amend NEPA and explicitly waive sovereign immunity in cases where a violation of

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124 Michael Waters, *How Prisons are Poisoning Their Inmates*, The Outline (July 23, 2018), https://theoutline.com/post/5410/toxic-prisons-fayette-tacoma-contaminated [https://perma.cc/S8H9-N2J8] (quoting U.S. Dep't of Just. Fed. Bureau of Prisons, Final Environmental Impact Statement: Florence, Colorado Federal Correctional Complex (1989)).

125 Waters, *supra* note 124.

126 *Id.*

127 *See supra* note 119 and accompanying text.

128 *See generally,* Waters *supra* note 124.

NEPA or environmental justice guidelines leads to environmental injustice. The procedure and language for this necessary amendment could be modeled after the FTCA, a successful example of Congress waiving sovereign immunity to close a remedy gap for plaintiffs injured by government actors.[129] Additionally, the language of such an amendment must incorporate reference to the environmental justice guidelines to increase enforceability of those guidelines and opportunity for redress following violations.

A. A Specific Solution Modeled on the Federal Tort Claims Act

To effectively provide an adequate monetary remedy to individuals who have suffered harm caused by exposure to toxic substances as a direct result of being incarcerated in a federal correctional institution built on land known to be environmentally unsafe at the time the BOP building project was carried out, Congress needs to pass an amendment to NEPA prioritizing environmental justice concerns like those highlighted in Executive Orders 12898 and 14096. An amendment of this kind is also necessary to protect individuals who may be incarcerated in correctional facilities built under similar circumstances in the future from facing the same dangers and potential health impacts as those at existing unsafe sites. Specifically, Congress should add a specific provision to NEPA waiving sovereign immunity and allowing for liability and monetary relief where it can be shown that a lack of adherence to NEPA guidelines and the environmental justice guidelines outlined in Executive Order 12898 caused harm resulting in environmental injustice. This would serve to codify the environmental justice guidelines as well as to provide injured plaintiffs with a more adequate remedy. Congress has similarly passed legislation waiving sovereign immunity in the past where the need for redress was great and potential plaintiffs did not have access to financial compensation from the government for wrongs committed by its agents.[130]

The language for such an amendment to NEPA could be borrowed from both the FTCA and Executive Order 12898. Specifically, an effective amendment to NEPA could include a provision reading:

> 'the district courts… shall have exclusive jurisdiction of civil actions on claims against the United States, for money damages…or personal injury or death caused by the negligent or wrongful act or omission of any employee of the Government while acting within the scope of his office or employment, under circumstances where the United States, if a private person, would be liable to the claimant in accordance with

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129 *See supra* notes 67-71.

130 Contino & Kuersten, *supra* note 9.

> the law of the place where the act or omission occurred,'[131] 'when such wrongful or negligent conduct arises out of a failure to "[identify] and [address]…disproportionately high and adverse human health or environmental effects…on minority populations and low-income populations in the United States'[132] or other uniquely situated groups who face statistically greater environmental injustice in society than the average American.

This language would narrowly tailor suits to toxic environmental torts caused by a lack of adherence to environmental justice guidelines. Under this amendment a plaintiff would likely need to show that (1) a toxic tort action could otherwise be brought if against a private party as opposed to the federal government for the harm suffered by the plaintiff, and (2) a violation of environmental justice guidelines, or a NEPA violation implicating environmental justice concerns, took place during the NEPA review process.

Like it did when it created and passed the FTCA, Congress could amend NEPA to include language, like the language provided above, that would provide a monetary damages remedy in circumstances where violations of NEPA guidelines and a failure to take environmental justice considerations into account lead to cases of notable environmental injustice and harm to health and safety due to forced exposure to unsafe environmental conditions. Additionally, the amended language could specifically incorporate language from Executive Order 12898 and Executive Order 14096 to make those guidelines more enforceable on federal agencies, specifically the federal BOP. Amended language of this kind, while opening the government up to suits for financial compensation by individuals who have been incarcerated on toxic or contaminated land, could be constrained to provide a remedy for the specific or very similar kinds of harm to that suffered by individuals in the situation that is the focus of this Note. This would serve to prevent an unnecessary or inefficient influx of NEPA lawsuits seeking financial compensation in areas that do not relate directly to or concern issues of environmental injustice. The FTCA creates "significant substantive limitations on the types of tort lawsuits a plaintiff may permissibly pursue against the United States" such as the Discretionary Function Exception mentioned above.[133] Again, the FTCA can serve as an example of the feasibility of language instituted by Congress waiving sovereign immunity and allowing for financial compensation in lawsuits naming the federal government as a defendant when that language is narrowly tailored to the specific instance or instances that have otherwise left wrongfully injured plaintiffs without an adequate method for or path to

131 Federal Tort Claims Act, 28 U.S.C. § 1346(b) (1946).

132 Exec. Order No. 12,898, 59 Fed. Reg. 32 (Feb. 16, 1994).

133 Contino & Kuersten, *supra* note 9, at 16.

receiving financial compensation.[134] The solution proposed by this Note serves as a concrete way to ensure that NEPA guidelines and goals and environmental justice guidelines are being followed, and that where they are not followed, an adequate damages remedy exists to fairly compensate those who have suffered negative health impacts because of that failure to comply or because of inadequate compliance.

Much like the FTCA, funding for awards given as part of the judgments that would be handed down as part of suits under the proposed amended NEPA language would likely come from the Judgment Fund. The Judgment Fund is "a permanent, indefinite appropriation" that was put in place by Congress in 1956 to streamline access to appropriations for final judgements that parts of the government facing suit were not set up to pay with their own revenue or some other secondary funding source.[135] Additionally, as the BOP holds individuals who have processed through the United States federal court system or are in the process of doing so,[136] a fund could be established to help pay damages related to environmental justice lawsuits by taking a portion of court costs from each federal criminal case. However, research by the Brennan Center for Justice suggests that this may not be an effective way to raise revenue largely because of the number of criminal defendants unable to pay their fees and costs.[137] The Judgment Fund appears to be the most straightforward system for appropriating funds to the lawsuits that would potentially be brought under the amended language suggested above, and it is already actively working.

B. Previously Proposed Solutions and Their Problems

While some legal scholars and researchers have proposed other possible solutions to protect or compensate individuals who are, have been, or will be incarcerated in institutions built on land known to be unsafe at the time of construction and operation, the main solutions posited in the available literature seem to face extreme challenges in their ability to be litigated or their ability to provide adequate relief.[138]

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134 *See generally* Contino & Kuersten, *supra* note 9.

135 *About the Judgement Fund,* U.S. Dep't of the Treasury (Mar. 22, 2018), https://www.fiscal.treasury.gov/judgment-fund/about.html [https://perma.cc/T5FJ-8EKF].

136 U.S. Dep't of Just., Fy99 Annual Accountability Report, Core Function Five: Detention And Incarceration (1999).

137 Matthew Menendez et. al., *The Steep Costs of Criminal Justice Fees and Fines,* Brennan Ctr. Just. (Nov. 21, 2019), https://www.brennancenter.org/our-work/research-reports/steep-costs-criminal-justice-fees-and-fines [https://perma.cc/XH26-2DUV].

138 *See generally*, Rosemary Martin, *When the Eighth Amendment Fails: The Safe Drinking Water Act for Protection Against Contaminated Prison Water*, 14 Geo. Wash. J. Energy & Env't L. 53, 53-54 (2023)

The scope of potential solutions also seems to pose another hurdle to certain groups of potential plaintiffs.[139]

Specifically, the Eighth Amendment to the United States Constitution and the Safe Drinking Water Act ("SDWA") have both been proposed as possible avenues to relief in this context.[140] Legal scholars have argued that subjecting inmates to incarceration in "toxic prisons [is] a form of cruel and unusual punishment and [is] therefore unconstitutional under the Eighth Amendment."[141] However, scholarship in this area posits that "because the Eighth Amendment has an elaborate actus rea requirement and mens rea requirement, it is not a reliable tool for people who are incarcerated."[142] These requirements mean that plaintiffs have to be able to show (1) that the individual faced "sufficiently serious" harm and "(2) that the defendant was deliberately indifferent to his health or safety."[143] The subjectivity of the test for an Eighth Amendment claim often makes it hard for deserving plaintiffs to win cases based on harms they suffered related to environmental hazards while incarcerated.[144] For these reasons, the Eighth Amendment does not provide a reliable or sufficiently objective framework under which incarcerated individuals suffering damage to their health caused by exposure to environmental toxins could recover monetarily for the harm suffered.

The SDWA, while providing a much easier path to a showing sufficient for liability, which does not include a subjective provision based on the knowledge of responsible government actors,[145] does not go far enough or have a broad enough scope to provide an adequate solution and path to recovery for all potentially deserving plaintiffs in this context. As previously discussed, inmates in federal prisons constructed on or near Superfund Sites or other environmentally unsound land may face exposure in a variety of ways such as through contact with the soil, through air exposure, or through contact with contaminated groundwater.[146] The SWDA is only designed for "the regulation of water contaminants."[147] Additionally, the SWDA "does not allow plaintiffs

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139 *Id.*

140 *See* Carpenter, *supra* note 1, at 240; Martin, *supra* note 139, at 53.

141 Carpenter, *supra* note 1, at 248.

142 Martin, *supra* note 139, at 53.

143 *Id.* at 53-54 (citing Farmer v. Brennan, 511 U.S. 825, 834 (1994) (quoting Rhodes v. Chapman, 452 U.S. 337, 347 (1981), and Wilson v. Seiter, 501 U.S. 294, 302- 03 (1991)).

144 Martin, *supra* note 138, at 55-59.

145 *Id.* at 59.

146 *See generally*, Waters, *supra* note 124 (discussing the negative health outcomes people facing incarceration have experienced at prisons across the country near environmental hazards).

147 Martin, *supra* note 139, at 59 (referencing Lena H. Humphreys & Mary Tiemann, Cong. Rsch. Serv., RL31243, Safe Drinking Water Act (SDWA): A Summary of the Act and Its Major Requirements 2-3 (2021)).

to recover damages" and instead one of the usual remedies is in the form a consent decree.[148] For these reasons, previously posited solutions do not seem to provide adequate paths to forwarding environmental justice goals and appropriately compensating plaintiffs who have been injured due to exposure to environmental hazards and toxic substances exacerbated by noncompliance with NEPA and environmental justice guidelines. A more concrete legislative change, such as the amendment to NEPA proposed above, is needed to accomplish these goals and to provide adequate compensation to people who have faced environmental injustice at the hands of the BOP specifically.

Conclusion

Individuals facing prolonged incarceration at the hands of the United States federal government have been subjected to exposure to toxins and unsafe environmental conditions due to land, air, and ground water contamination for decades.[149] Given NEPA and Executive Order 12898's failure to provide a separate judicial review framework and monetary damages remedy for agency noncompliance or inadequate compliance, specifically BOP noncompliance with NEPA and stated environmental justice guidelines, individuals who have been harmed are without an adequate method to seek enforcement as well as financial compensation for that harm. To correct this clear gap in both enforcement and remedy and to correct the need for a path to achieve those things, Congress must amend NEPA to include language waiving the sovereign immunity of the federal government in this specific context and instituting a monetary remedy for agency noncompliance resulting in violations of the environmental justice guidelines and principles highlighted in President Clinton's E.O. 12898. A less concrete solution that continues to leave potential plaintiffs without a method to obtain a monetary damages remedy would ensure the continued exacerbation of environmental injustice on the kinds of populations and communities that environmental justice guidelines were put forth to consider and protect. Guidelines are clearly not enough to force the compliance of agencies, and in this context where the lives of individuals who have no control over their residence are at stake, concrete consequences for agency noncompliance seem to be the only way to move forward and ensure environmental justice.

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148 Martin, *supra* note 139, at 63.

149 *See generally* Waters, *supra* note 124.