NOTE

WHERE'S THE CARROT?: EXAMINING REGULATORY SYSTEMS IN ENVIRONMENTAL LAW

DAWSON GALLUZZI*

ABSTRACT

Current environmental law is limited in its efficacy due to the mechanisms it relies on to encourage firms to adopt more climate-considerate practices. The result is that climate change presents an ever-growing threat to the Earth's inhabitants. The Federal Government has several regulatory tools at its disposal to produce better environmental law, although each branch's priorities may conflict with one another. The efficacy of federal environmental legislation and rulemaking is influenced by the choice of incentives systems which are used to regulate firms. Considerable administrative costs are incurred by regulatory agencies attempting to structure these compliance systems to be acceptable in both political and social contexts. One approach that has been shown to be effective through historical review is when agencies adopt a dual-structure incentive system. Within the environmental context, this method results in agency-setting of an emissions floor. This structure is less restrictive on firm action than alternatives including mandatory restrictions, such as command-and-control, or goal-oriented programs, such as a performance-based standard. Since firms retain considerable control over their operation, they are incentivized to adjust them to meet the floor or even a higher standard. If agencies further adopt incentive-based rewards for firms complying at a higher standard, they can regulate emissions and reward a diligent firm for lowering their emissions towards a more socially optimal amount. By introducing incentive-based rules, agencies such as EPA will be able to reduce the "information gap" between their regulators and the needs of the regulated firm. While there is historic backing, incentive-based regulations may be restricted by judicial precedent and interpretations of environmental

* J.D. 2023, New York University School of Law and Articles Editor, New York University Environmental Law Journal. I currently work in the Rhode Island Attorney General's Office in its Criminal Division. I would like to thank Professor Davis-Noll for her help on the initial draft of this paper and Laura, Sarah, Kyle, Olivia, Josh, and Chamblee for their help in refining my ideas for this journal. Mom and Dad, Grandpa Don and Grandma Margie, I love you, thank you for all your help in getting me here, and I couldn't have done this without you. To Dwight, these are the papers that you can look forward to writing in 10 years, good luck. And to Buddy "Mar" Galluzzi, thank you for being such a good boy, even if you get drool on everyone and everything.

statutes. Without legislation clarifying the ability of regulators to utilize these frameworks when designing compliance structures, it is likely that they will continue to be hampered by the Supreme Court.

INTRODUCTION

While virtue may be "its own reward" according to the Stoics,[1] tackling the climate crisis typically requires more tangible incentives for action than virtue alone. In the past half-century, the federal government has taken a significant supervisory role in the regulation of pollutants, both nationally and internationally. While there were once relatively few regulations, today there is a complex bureaucracy directed by the Environmental Protection Agency (EPA).[2] As

[1] *See* PIERRE HADOT, THE INNER CITADEL: THE MEDITATIONS OF MARCUS AURELIUS 240 (Michael Chase trans., Harvard Univ. Press 1998) (1992).

[2] *See, e.g.*, *Laws and Executive Orders*, EPA, https://www.epa.gov/laws-regulations/laws-and-executive-orders (last updated July 3, 2023).

the fiftieth anniversary of the modern Clean Water Act[3] and the sixtieth anniversary of the Clean Air Act[4] draw nearer, it is prudent to examine the inner workings of the United States' environmental regulations. While the names of the bills are usually self-explanatory regarding what they regulate, *how* they regulate practices and incentivize compliance has changed significantly over the past five decades.

There has been a shift from the initial days of "top-down" governance by executive authorities using direct regulation, such as pollution controls and equipment mandates, to a delegated system of standards in which polluting entities have more control over how to reduce emissions to reach prescribed levels.[5] This assignment put the onus on firms to determine the most cost-effective way to reduce their output of pollutants but also made compliance with environmental laws an unnecessary hardship on them due to the lack of clear standards.[6] Furthermore, there are insufficient inducements built into the existing regulatory structure; current environmental regulations are a punitive system such that failure to meet the polluting standard results in increased oversight and punishments, such as fines.[7] Due to this framework, polluting companies comply with the current environmental legal systems only to avoid punishment

[3] *See Milestones in EPA and Environmental History*, EPA, https://www.epa.gov/history/milestones-epa-and-environmental-history (last updated June 7, 2023).

[4] *See id.*

[5] This can be shown through increasing reliance on a system of performance standards. *See, e.g.*, 42 U.S.C. § 7411 (providing for the standards of performance for new stationary sources under the Clean Air Act).

[6] *See* Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENV'T L. REV. 297, 297–300 (1999) ("The essential picture of regulation in much of the environmental literature is that Congress passes a law, federal agencies implement the program (usually through rulemaking), and compliance follows in due course . . . . From the point of view of the practicing lawyer, [this picture] may seem almost irrelevant . . . . The conventional picture seriously distorts the realities of the present system . . . . What environmental lawyers do much of the time could be considered slippage management.").

[7] *See generally* Sally Simpson et al., *Why Do Corporations Obey Environmental Law? Assessing Punitive and Cooperative Strategies of Corporate Crime Control*, U.S. DEP'T OF JUST. (Nov. 2007), https://www.ojp.gov/ncjrs/virtual-library/abstracts/why-do-corporations-obey-environmental-law-assessing-punitive-and.

but are not incentivized to reduce emissions of a pollutant lower than the regulations.[8] This system is insufficient to encourage further reduction of pollution but could do so by supplementing the delegation system with voluntary incentives to reduce further pollutants.

An approach which combines enforcement mechanisms, set standards, and voluntary goals with additional rewards may be the most prudent way to generate effective regulations and incentivize compliance and additional efforts. Specifically, this structure could help ensure that agency goals are met by matching increasingly demanding standards with increasing rewards for observance. While the current federal system has a great understanding of how to use the "stick" in ensuring compliance with environmental laws, this Note asks: "where's the carrot?" Incentives in environmental policy are one of the quickest ways to spur change in the marketplace; they generate a system of rapid results driven by voluntary action rather than actions pursued under the threat of punishment. The result is more pursued and sustained compliance with environmental law, although care must be taken that the offered rewards do not lead to an acceleration of already degraded environments. As the climate crisis continues to unfold and expand, incentive-based regulations will be a way to augment environmental laws to produce greater impacts and it will be up to policymakers to ensure that impact is restorative rather than destructive.

This Note will examine the structure of environmental regulations and how they could be improved through a voluntary incentives system, with a focus on current litigation establishing important judicial determinations of agency power.[9] Part I of the Note examines the history of the early "command-and-control" regulations, as well as the "market-based" reforms made to the environmental program during the Reagan and both Bush administrations.[10]

---

[8] *See* EPA, GUIDELINES FOR PREPARING ECONOMIC ANALYSES: REGULATORY AND NON-REGULATORY APPROACHES TO POLLUTION CONTROL 4-2 (2010), https://www.epa.gov/sites/default/files/2017-09/documents/ee-0568-04.pdf.

[9] *See* Ella Nilsen, *The Supreme Court Is Hearing a Major Case on EPA's Authority over Planet-Warming Gasses. Here's What's at Stake.*, CNN (Feb. 26, 2022), https://www.cnn.com/2022/02/26/politics/epa-supreme-court-greenhouse-gas-climate-explained/index.html.

[10] *See* GUIDELINES FOR PREPARING ECONOMIC ANALYSES, *supra* note 8, at 4-4–4-5; *see also* Elise Stefanik, *Market-Oriented Solutions to Climate Change*, THE

After examining the trend towards performance standards, this Note will assess how those programs have been reviewed by the courts. Finally, the increased use of consent decrees in settling environmental litigation has shown an alternative way to resolve disputes through mutual incentives while maintaining the possibility of enforcement actions.[11] Part II examines critiques of the "command-and-control," "performance standard," and "incentive-based" systems, examining the benefits and drawbacks to each regulation type. Part III studies performance standard reforms, their historical development, and how they are applied in environmental regulations. Part IV further examines incentive-based policymaking, and how it has been applied in countries such as Chile. Part V examines the historical context behind incentive-based subsidies through restrictive quotas, the Hawaiian sugar industry, and tax incentives in the oil and gas industries. Finally, this Note concludes with a discussion of studies on indirect incentives, how they have shaped the future of the energy industry, and how they will affect the ability of executive agencies to regulate these industries even as it becomes increasingly difficult for Congress to pass legislation on these topics.

I. PRE-ENVIRONMENTALISM REGULATIONS

While most dedicated federal environmental laws did not get passed until the 1970s,[12] there was an earlier system to regulate harms to the environment through the common law.[13] Parties often used the common law doctrines of nuisance and trespass for private actions.[14] Examples of environmental law at common law included:

CATALYST (Spring 2019), https://www.bushcenter.org/catalyst/environment/stefanik-market-solutions (describing how "Republicans have championed market-based solutions for decades," including specific examples from these three Republican administrations).

[11] *See* David L. Cailles, *The Use of Consent Decrees in Settling Land Use and Environmental Disputes,* 21 STETSON L. REV. 871, 872–73 (1991).

[12] *See Milestones in EPA and Environmental History*, *supra* note 3.

[13] *See* Richard Myers, *A Brief History of Environmental Regulation: Why You Need to Understand the Past to Influence the Future*, ENV'T FED'N OF OKLA., http://envirofdok.org/wp-content/uploads/2013/03/Myers-Oklahoma-Presentation-2013v2.pdf (last visited Mar. 28, 2023).

[14] *See* Jason Czarnezki & Mark Thomsen, *Advancing the Rebirth of Environmental Common Law*, 34 B.C. ENV'T AFFS. L. REV. 1, 1–3, 7 (2007).

neighbors disturbing another person's land[15] or the taking of another's hunted game.[16] Judges applying tort law were equipped to dispose of cases involving highly visible damages to specific individuals.[17] However, the judicial system had a harder time regulating incidents involving more attenuated harms where there was greater uncertainty between the immediate result and the action that caused it.[18]

Federal agencies passed their initial regulations in the shadow of already existing state regulatory programs, created under the state's "police powers" in the areas of public safety and health.[19] One example of this wave of federal safety regulation is the passage of the Atomic Energy Acts of 1946 and 1954 to regulate a relatively new energy source. Public scrutiny pressured legislators to continue to pass environmental regulations following subsequent environmental tragedies, such as the Cuyahoga River fire.[20] Along with these new regulations, there was also support within Congress for the creation of an agency which would oversee these regulations. The agency would be delegated certain legislative authority while maintaining enforcement power through its placement in the executive branch. A legislative proposal in 1969 created the Council on Environmental Quality in the Executive Office,[21] and led to the establishment of EPA in 1970.[22] With the support of President Nixon,

15 *See* Keeble v. Hickeringill [1701] 103 Eng. Rep. 1127, 1127.

16 *See generally* Pierson v. Post, 3 Cai. 175 (N.Y. Sup. Ct. 1805).

17 While the doctrine of private necessity allows a boat owner to tie their boat to a dock during a storm, the boat owner must compensate the owner of the dock for the damage that the boat causes. *See generally* Vincent v. Lake Erie Transp. Co., 124 N.W. 221 (Minn. 1910).

18 For an example of how tough the standards for tort litigation are, see generally Note, *Rethinking Actual Causation in Tort Law,* 130 HARV. L. REV. 2163 (2017).

19 *See* Daniel A. Brown, *Executive Constraint, Judicial Uncertainty, and Legislative Complacency: Washington Responds with a Progressive Approach to Climate Change*, 31 SEATTLE U. L. REV. 707, 712 (2008).

20 *See The 1969 Cuyahoga River Fire*, NAT'L PARK SERV., https://www.nps.gov/articles/story-of-the-fire.htm (last updated May 3, 2022).

21 *See Council on Environmental Quality*, THE WHITE HOUSE, https://www.whitehouse.gov/ceq/ (last visited July 12, 2023).

22 *See The Guardian: The Origins of the EPA*, EPA (1992), https://www.epa.gov/archive/epa/aboutepa/guardian-origins-epa.html.

EPA's mission centered on both the creation and enforcement of regulatory standards as the "protector" of the environment, as well as "the conduct of research on the adverse effects of pollution."[23] With a large mission and Congress's delegation of power, EPA was empowered to examine new regulatory structures.

II. COMMAND-AND-CONTROL REGULATIONS

A. *Emergence of Command-and-Control Regulation*

During the first twenty years of its life, EPA focused its regulations on two important goals: creating a regulatory regime within the sphere of influence delegated to it by Congress and ensuring that companies complied with EPA's regulations. Regulations passed by EPA and other federal regulatory agencies during this period used a regulatory scheme called "command-and-control." These types of regulations are hardline rules made by enforcement agencies (the "command") which directly oversee portions of the business practice (the "control").[24] A major concern of EPA was the regulation of "point source" pollution, which were areas in the environment into which pollutants were being introduced, such as in waterways.[25] EPA designed its regulations to ensure that owners of "point sources" reduced pollutant discharge as much as possible.[26] In the case of certain chemicals, such as DDT—which was used as an insecticide—there were even direct bans.[27] These rules were absolutes: either owners of point sources subscribed to EPA's particular regulations, or else they were not in compliance. These regulations, therefore, were more process-oriented than goal-oriented.[28] If there were more cost-effective ways to reduce pollution but those methods did not comply with EPA regulations, there was no incentive on

[23] *See id.*

[24] *See generally* Farber, *supra* note 6.

[25] *See Common Considerations*, EPA, https://www.epa.gov/sourcewaterprotection/common-considerations (last updated Feb. 8, 2023).

[26] *See NPDES Permit Basics*, EPA, https://www.epa.gov/npdes/npdes-permit-basics (last updated Dec. 23, 2022).

[27] *See DDT Ban Takes Effect*, EPA (Dec. 31, 1972), https://www.epa.gov/archive/epa/aboutepa/ddt-ban-takes-effect.html.

[28] *See* Farber, *supra* note 6, at 299 (explaining how "negative slippage" can occur through environmental regulation, where mandates are unable to be enforced to the fullest extent).

the part of the regulated firm to pursue them. These regulations "controlled" companies by enforcing specific equipment or processes to reduce emissions rather than encouraging them to find ways to reduce their footprint that may synergize better with industry practice.

However, this control approach would ultimately result in considerable pushback against EPA from pro-business circles.[29] Starting under the Reagan administration, the agency began shifting toward regulatory standards and goals regarding pollutants rather than past processes of command-and-control regulations.[30] While there are notable exceptions, such as the complete ban on chlorofluorocarbon (CFC) emissions[31] and other international bans on materials through the Montreal Protocol,[32] much of the regulation was designed to give polluting entities choices about their mitigation techniques rather than enforce a specific process. This was done by focusing on the final emissions of pollutants rather than the earlier focus on mitigation under the command-and-control approach.

B. *Current EPA Use of Command-and-Control Regulations*

Command-and-control regulations allow for direct action against specific pollutants. They are also generally better protected from judicial scrutiny since addressing the consequences of pollution falls within EPA's statutory authority to regulate.[33] Command-and-control regulations show rapid results so long as there are

[29] *See* Robert A. Wampler, *U.S. Climate Change Policy in the 1980s*, GEO. WASH. U. NAT'L SEC. ARCHIVE (Dec. 2, 2015), https://nsarchive2.gwu.edu/NSAEBB/NSAEBB536-Reagan-Bush-Recognized-Need-for-US-Leadership-on-Climate-Change-in-1980s/.

[30] One of the major complaints of the early command-and-control regulations was that they required significant government oversight into reductions in pollution, which could be better served by giving the decision-making power to the firms that knew the processes better. *See* Farber, *supra* note 6, at 298–99, 318.

[31] *See* EPA, PESTICIDE REGULATION (PR) NOTICE 93-4 (1993).

[32] *See The Montreal Protocol on Substances That Deplete the Ozone Layer*, U.S. DEP'T OF STATE, https://www.state.gov/key-topics-office-of-environmental-quality-and-transboundary-issues/the-montreal-protocol-on-substances-that-deplete-the-ozone-layer/ (last visited Apr. 1, 2023).

[33] *See* West Virginia v. EPA, 142 S. Ct. 2587, 2623 (2022) (Gorsuch, J., concurring) (noting "a 'mismatch' between the EPA's expertise over environmental matters" and "balancing the many vital considerations of national policy implicated in deciding how Americans will get their energy.").

alternative methods of production available and an adequate enforcement apparatus. One of the greatest successes of EPA in the recent past was the near-complete elimination of CFCs.[34] In 1991 EPA banned the usage of CFCs in most contexts,[35] following receipt of news that increasing concentration of CFCs was depleting the Ozone layer.[36] This quick action taken domestically, in conjunction with international actions on environmental safety such as the Montreal Protocol, is an important reason the Ozone layer is healing and will likely make a full recovery in this century.[37]

However, command-and-control regulations also have significant disadvantages. One of their main drawbacks is the incredible amount of information needed by a regulatory agency such as EPA to make a functional rule. The agency responsible for setting an environmental rule must ensure that a regulation will allow some kind of "free choice, flexibility, and innovation,"[38] while making sure that it is strict enough to achieve the administration's goals of institutional effectiveness. For industries with a significant amount of polluting production, such as the petroleum industry, this can be incredibly difficult.[39] As with CFCs, when there is a single pollutant with easy mitigation strategies, direct management may be the most effective way to reduce emissions. However, as the administrative state has grown,[40] administrators of regulatory systems have increasingly moved towards market- or incentive-based regulations to

[34] *See Chlorofluorocarbons and Ozone Depletion*, AM. CHEM. SOC'Y, https://www.acs.org/education/whatischemistry/landmarks/cfcs-ozone.html (last visited Apr. 10, 2023).

[35] *See Regulatory History of CFC's and Other Stratospheric Ozone Depleting Chemicals (to 1993)*, EPA (Apr. 23, 1993), https://www.epa.gov/archive/epa/aboutepa/regulatory-history-cfcs-and-other-stratospheric-ozone-depleting-chemicals-1993.html.

[36] *See Chlorofluorocarbons and Ozone Depletion*, *supra* note 34.

[37] *See Current State of the Ozone Layer*, EPA, https://www.epa.gov/ozone-layer-protection/current-state-ozone-layer (last updated Aug. 12, 2021).

[38] *See* James A. Swaney, *Market Versus Command and Control Environmental Policies*, 26 J. ECON. ISSUES 623, 624–25 (1992) (describing the many factors which can be weighed when undergoing the task of agency regulation).

[39] *See United States Remains Largest Producer of Petroleum and Natural Gas Hydrocarbons*, U.S. ENERGY INFO. ADMIN. (May 23, 2016), https://www.eia.gov/todayinenergy/detail.php?id=26352.

[40] *See* Gillian E. Metzger, *1930s Redux: The Administrative State Under Siege*, 131 HARV. L. REV. 1, 36–38 (2017).

help eliminate that "knowledge gap" between rule-makers and rule-followers.[41]

C. *Command-and-Control after* West Virginia v. EPA

Although direct regulations have not historically faced challenges under the Major Questions Doctrine and Non-Delegation Doctrine, *West Virginia v. EPA* demonstrates how the Supreme Court can utilize these doctrines against command-and-control regulations. These two interpretive canons relate to how Congress is assumed to delegate power to executive agencies. The Non-Delegation Doctrine enforces a strict separation of powers based on the idea that Congress "cannot delegate its legislative power . . . to other entities."[42] The Major Questions Doctrine, which is more commonly cited today,[43] stands for the idea that "Congress must speak particularly clearly when it authorizes the executive branch to take on matters of political or economic significance."[44] Because this is not a constitutional limitation, Congress could always moot a Major Questions case by speaking in favor of the proposed delegation. In *West Virginia v. EPA*, the states of West Virginia and North Dakota, as well as coal and mining corporations, challenged the standards

[41] For an example on the "knowledge gap," see *Addressing the Knowledge Gap*, U.N. ENV'T PROGRAMME: BEAT POLLUTION, https://www.unep.org/beatpollution/take-action/addressing-knowledge-gap (last visited Apr. 10, 2023), describing the problems of a "low national capacity for analyzing data and assessing . . . social and environmental costs"; see generally Roberton C. Williams III, *Growing State-Federal Conflicts in Environmental Policy: The Role of Market-Based Regulation*, 96 J. PUB. ECON. 1092 (2012), describing the structural changes of federal regulation from command-and-control regulations to "market-based regulations," which include both incentive-based and market-based solutions.

[42] *Nondelegation Doctrine*, CORNELL L. SCH.: LEGAL INFO. INST., https://www.law.cornell.edu/wex/nondelegation_doctrine (last visited Apr. 10, 2023); *see The History of the Doctrine of Nondelegatability*, CORNELL L. SCH.: LEGAL INFO. INST., https://www.law.cornell.edu/constitution-conan/article-1/section-1/the-history-of-the-doctrine-of-nondelegability (last visited May 10, 2023).

[43] *See generally* Adam Liptak, *The Curious Rise of a Supreme Court Doctrine That Threatens Biden's Agenda*, N.Y. TIMES (Mar. 6, 2023), https://www.nytimes.com/2023/03/06/us/politics/supreme-court-major-questions-doctrine.html; *The History of the Doctrine of Nondelegatability*, *supra* note 42 ("the Court's solution has been to reject delegation challenges in all but the most extreme cases, and to accept delegations of vast powers to the president or to administrative agencies.").

[44] Liptak, *supra* note 43.

set out by the never-implemented "Clean Power Plan."[45] By a vote of 6–3, the Court struck down the Clean Power Plan as being an overreach of EPA's statutory authority.[46] Notably, the proposed regulation was not directly regulating pollutants.[47] However, the main restriction on EPA's authority is related to a command-and-control regulation known as "generation shifting." Under the Clean Power Plan, EPA sought to limit the emissions of certain resources using generation shifting mechanisms, citing their statutory authority under 42 U.S.C. § 7411.[48] The Court ruled that EPA was unable to mandate this shift. Justice Gorsuch's concurrence reasoned that it was a "mismatch between an agency's challenged action and its congressionally assigned mission and expertise," meaning EPA would be regulating something other than the source of the pollution which Congress authorized.[49] Thus, the Court stated generation shifting fell under the Major Questions Doctrine, and so required that EPA receive "clear delegation" from Congress to promulgate such regulations.[50]

West Virginia v. EPA may have a similar impact to *Massachusetts v. EPA*, as they both provide groundwork for EPA's structural programs. Any future EPA administrator will understand that an "outside the fence" regulation poses risks of a lawsuit by polluters and their allies, meaning EPA must distinguish future regulations from the Clean Power Plan. However, the Biden administration hasn't been silent on environmental regulation. Legislation by the 117th Congress has provided both a defensive line by codifying past precedents as well as some routes forward with regulations. The core holdings of *Massachusetts v. EPA* were codified into law by a portion of the Inflation Reduction Act of 2022 (IRA), which ensures that many airborne pollutants will continue to be under EPA's

45 *See generally* West Virginia v. EPA, 142 S. Ct. 2587 (2022).

46 *See id.* at 2587–91.

47 *See id.* at 2587–89.

48 *See* David Driesen, *The Clean Power Plan: Unpacking the Generation Shifting Issue*, CTR. FOR PROGRESSIVE REFORM (Sept. 8, 2016), https://progressivereform.org/cpr-blog/the-clean-power-plan-unpacking-the-generation-shifting-issue/.

49 *West Virginia*, 142 S. Ct. at 2623.

50 *See id.* at 2616 ("A decision of such magnitude and consequence rests with Congress itself, or an agency acting pursuant to a clear delegation from that representative body.").

purview.[51] Since the Court decided this case based on the Major Questions Doctrine,[52] an opposing court would have to reckon with this explicit acknowledgement of authority.

Like the language that enshrined *Massachusetts v. EPA*, *West Virginia v. EPA*'s impact was affected by the IRA. While there is no language in the IRA that explicitly negates *West Virginia v. EPA*'s holding, the IRA provides an economic solution to the problems posed by *West Virginia v. EPA*'s cost-related reasoning. Inside the IRA are funding mechanisms which will help to decrease the cost of clean energy and emissions-reductions programs.[53] Because of the current regulatory system of EPA, which has factored in cost-benefit analysis "since the Reagan Era,"[54] reducing implementation costs necessarily increases the permissible scope of regulation. A significant argument of the plaintiffs in *West Virginia v. EPA* concerned the way the Clean Power Plan forced states to regulate in a specific manner and the costs imposed on the regulated community.[55] If these costs can be limited, it will make *West Virginia v. EPA* distinguishable in future litigation. Some Democratic party officials are more optimistic and believe the current language is a "game changer" which will "cement[] E.P.A.'s authority."[56] However, the current language is designed as a defensive barricade more than an offensive strategy. Post-facto comments, such as in the IRA, usually receive "little weight" from the courts and, in such a

[51] *See* Kate Aronoff, *No, the Inflation Reduction Act Did Not "Overturn" West Virginia v. EPA*, THE NEW REPUBLIC (Aug. 24, 2022), https://newrepublic.com/article/167520/inflation-reduction-act-overturn-west-virginia-epa.

[52] *See West Virginia*, 142 S. Ct. at 2610 ("Under our precedents, this is a major questions case.").

[53] *See* Aronoff, *supra* note 51 ("[The IRA]'s bread and butter is in making clean energy cheaper, which may change the calculus around how new regulations are crafted and how ambitious they can be.").

[54] *Id.* ("cost-benefit analysis . . . has been a legal requirement for new regulations since the Reagan era") (emphasis omitted).

[55] *See* Oral Argument at 23:13, West Virginia v. EPA, 142 S. Ct. 2587 (2022) (No. 20-1530) ("The Clean Power Plan set an aggressive system that said that there were options for the state, but, really, there weren't because states couldn't actually have other options other than generation shifting and reduced output and the extremely aggressive measures that EPA set in place.").

[56] Lisa Friedman, *Democrats Designed the Climate Law to Be a Game Changer. Here's How*., N.Y. TIMES (Aug. 22, 2022), https://www.nytimes.com/2022/08/22/climate/epa-supreme-court-pollution.html.

narrowly-divided, partisan Senate, even moderate linguistic reforms died at the negotiation table.[57]

EPA's move towards broadening its existing incentive-based "cap-and-trade" systems will be stunted by the *West Virginia v. EPA* decision. The Court did not overrule *Massachusetts v. EPA*, so the precedents in that case which involve the direct regulation of carbon dioxide and other airborne pollutants will be safe for the near future.[58] EPA's authority to regulate airborne pollutants was strengthened by the IRA but legal experts remain skeptical that the change will have much impact.[59] EPA's authority will also expand naturally as mitigation technology becomes cheaper to implement over time, accelerated by programs like those in the IRA. Other forms of regulation, such as performance standards and command-and-control, will also be allowed so long as they are specific to the pollutants regulated. For litigants challenging agency authority, that rules can now fall into the Major Questions Doctrine is a boon which will be heavily utilized against other government agencies.[60]

The Court's block of the Clean Power Plan may have been more influential than approval of the program would have been. It was unlikely that the Obama administration's Clean Power Plan would ever become law because another administration could have a different response to the climate crisis. By ruling against its feasibility, however, the Supreme Court created an important precedent for how far environmental programs could reach—or rather, could not. By ruling that agency regulations can be scrutinized under the Major Questions Doctrine, the Court has provided another oversight

[57] *See* Marlo Lewis, Jr., *Inflation Reduction Act and West Virginia v. EPA: Legislative History Refutes Sen. Carper's Spin*, COMPETITIVE ENTER. INST. (Sept. 13, 2022), https://cei.org/blog/inflation-reduction-act-and-west-virginia-v-epa-legislative-history-refutes-sen-carpers-spin/ (stating "Section 60105(g) was later deleted on a point of order.").

[58] *See* Massachusetts v. EPA, 549 U.S. 497, 499–501 (2007).

[59] *See* Aronoff, *supra* note 51.

[60] A lawsuit challenging SEC authority on a similar environmentally focused regulation (requiring investment firms to provide data to support "environmental" investment claims) is now in the works. *See* Lesley Clark, *Red States Decry 'Woke Left' SEC Proposal for ESG Investing*, ENERGY & ENV'T NEWS (Aug. 18, 2022), https://www.eenews.net/articles/red-states-decry-woke-left-sec-proposal-for-esg-investing/.

that agency officials must consider if they want to future-proof their proposed rules against litigation.

D. *Possible Resurgence: Renewable Energy*

While biogas—a renewable fuel comprised of methane and other gases created "by the breakdown of organic matter"[61]—production does not currently enjoy federal support, there are biogas producing sites in all 50 states and Puerto Rico.[62] The systems range from a general pledge that "X" percentage of a state's energy must come from renewables such as biogas by a target year, to proposals that are more specific about the types of energy that must be produced.[63] The latter are state plans called "renewable portfolio standards" and they designate which types of energy must be produced.[64] Renewable portfolio standards are not based on incentives and are seen as binding guidelines, which is notable because some of the push towards renewable energy has been through voluntary programs.[65] These plans demonstrate that renewables have begun to be

[61] *What is Biogas?*, NAT'L GRID, https://www.nationalgrid.com/stories/energy-explained/what-is-biogas (last visited Apr. 11, 2023) (describing biogas as a renewable fuel created when "organic matter . . . is broken down by microorganisms in the absence of oxygen" and explaining that this process is called anaerobic digestion).

[62] *See Why Biogas?*, AM. BIOGAS COUNCIL, https://americanbiogascouncil.org/wp-content/uploads/2019/05/ABC_Market_Snapshot.pdf (last visited Apr. 11, 2023); *Biogas Opportunities Roadmap Report*, EPA, https://www.epa.gov/agstar/biogas-opportunities-roadmap-report (last updated Aug. 18, 2020) (showing a three-agency report into the study of biogas related systems and that it is possible that there will be more interest in this field under the Biden Administration).

[63] For examples of the variety of state standards for the adoption of renewable energy, see *State Renewable Portfolio Standards and Goals*, NAT'L CONF. OF STATE LEGISLATURES, https://www.ncsl.org/energy/state-renewable-portfolio-standards-and-goals (last updated Aug. 13, 2021) and see *Biomass Explained*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/biomass/landfill-gas-and-biogas.php (last visited Apr. 11, 2023), explaining that "[b]iogas may qualify as a renewable fuel" in state renewable portfolio standards and qualifies as an "advanced" fuel or "feedstock for low carbon fuels."

[64] *See State Renewable Portfolio Standards and Goals*, *supra* note 63.

[65] *See id.* (comparing the difference between states that have mandatory standards—30 states and D.C.—and those with voluntary goals—3 states). For an example of a voluntary program, see *Summary of the South Carolina Energy Freedom Act*, OFF. OF THE REGUL. STAFF (Sept. 2019), https://energy.sc.gov/files/view/SC%20Energy%20Freedom%20Act_summary%2009.012.2019.pdf.

included in command-and-control and performance standard legislation, which may further increase their adoption. Renewable portfolio standards allow for a greater deal of state control over how these goals are met than the percentage-based plans. These standards can stipulate, for example, that a certain amount of the renewable energy must come from a specific source,[66] which might ostensibly include biogas or solar energy. In places where this approach is used in conjunction with an emissions-trading system, it can lead to energy credits being more valuable because they fulfill multiple requirements. By increasing the value of these energy credits, states can encourage a greater production of the desired renewable resource and, thus, the percentage of their energy from renewables.

States may be relying on command-and-control regulations to support a shift to renewable energy due to political and social pushback against incentive-based policies. Specifically in the environmental sector, where most of the statutory authority was passed before incentives were a common regulatory structure, incentive-based regulation may be more prone to legal challenge than interpretive command-and-control regulations. Additionally, enforcement issues are seen to "shift the burden of proof to demonstrate compliance from government to regulated entities."[67] This feature may be why environmental-based subsidies have been more vulnerable than other regulatory schemes. For example, sugar subsidies continue to be a contested topic,[68] and there are mixed reactions to energy subsidies among lawmakers and the public.[69]

---

66 *See State Renewable Portfolio Standards and Goals*, *supra* note 63.

67 *Economic Incentives*, EPA, https://www.epa.gov/environmental-economics/economic-incentives (last updated Sept. 8, 2022).

68 Many conservative organizations continue to write for the abolition of the sugar subsidies. *See, e.g.*, Karla Jones, *Sugar Subsidies: A Bitter Pill for the States to Swallow*, AM. LEGIS. EXCH. COUNCIL (May 7, 2018), https://alec.org/article/sugar-subsidies-a-bitter-pill-for-the-states-to-swallow/; Justin Sykes, *Top Five Reasons to End U.S. Sugar Subsidies*, AMS. FOR TAX REFORM (Nov. 16, 2015), https://www.atr.org/top-five-reasons-end-us-sugar-subsidies/.

69 *See* Bill Maloney, *Renewable Energy Subsidies—Yes or No?*, FORBES (Mar. 23, 2018), https://www.forbes.com/sites/uhenergy/2018/03/23/renewable-energy-subsidies-yes-or-no/?sh=417603f66e23.

Additionally, incentive-based regulations are often subject to intense pressure from interest group lobbying,[70] with new industries entering the lobbying process as the federal government has begun regulating many other forms of energy and agricultural practices.[71] Many of the industries who have received subsidies, such as the sugar and oil markets, spend a significant amount in lobbying fees.[72] Approximately $120 million is spent by oil lobbyists every year since 2008.[73] As a point of comparison, alternative energy lobbyists nearly doubled their record spending in 2021,[74] and still only spent $19.07 million.[75] It is likely that the increased amount of lobbying funds—which in some cases has doubled in the past ten years[76]—will create a greater amount of subsidy incentive systems that will help to "equalize" the playing field for alternative energy with those industries like oil receiving these favorable policies already. Incentives systems are not just a passing interest for the federal government; rather, they provide real ways to influence the production of materials important to the energy security of the United States. As in the last twenty years, incentive-based systems will continue to expand and become more complex as policymakers learn the best ways to regulate firm behavior and because of their utility to interest groups. However, it is unlikely that interest groups will be able to completely displace the command-and-control apparatus entirely

[70] During the period of 2006–09, some of the highest spenders on lobbying were from both "brown" and "green" firms. *See* Magali Delmas, *Research: Who's Lobbying Congress on Climate Change*, HARV. BUS. REV. (Oct. 27, 2016), https://hbr.org/2016/10/research-whos-lobbying-congress-on-climate-change.

[71] *See Lobbying: Alternative Energy Production and Services*, OPENSECRETS, https://www.opensecrets.org/industries/lobbying.php?ind=e1500 (last visited Apr. 11, 2023) (conclusion based on graph data).

[72] *See Industry Profile: Oil and Gas*, OPENSECRETS, https://www.opensecrets.org/federal-lobbying/industries/summary?cycle=2021&id=E01 (last visited Apr. 11, 2023) [hereinafter OPENSECRETS]; Roberto A. Ferdman, *How the Sugar Lobby Helps Perpetuate that Sweet Tooth of Yours*, WASH. POST (June 25, 2014), https://www.washingtonpost.com/news/wonk/wp/2014/06/25/how-the-sugar-lobby-helps-perpetuate-that-sweet-tooth-of-yours/.

[73] *See* OPENSECRETS, *supra* note 72.

[74] *See id.*

[75] *See id.*

[76] *See id.*

due to its reliability and the structure of rulemaking in agencies, despite its aforementioned drawbacks.

III. PERFORMANCE-BASED REFORMS

A. *Historic Development*

As the backlash from command-and-control regulations intensified before and during the Reagan era, policymakers and government agencies looked for something which could provide companies greater mobility while still maintaining the core aims of an environmental program. Eventually, the shift led to a variety of rules that can be grouped under the term "performance-based," which are governed by standards. This structure was pioneered by other executive agencies, whose promulgation and enforcement demonstrated the approach's efficacy. A drawback of top-down control regulations is that regulators work from limited information when deciding bright-line standards, which leads them to both rely on and distrust industry- or lobbyist-supplied information.[77] However, moving to a structure that provides more leniency to firms regarding implementing changes to reach a desired goal—such as emissions reductions—is better. For example, since the organizations have a greater understanding of what could be done to reduce emissions,[78] a performance standard regulation for emissions reduction might prescribe "reducing emissions by 5%," and the organizations could pursue creative solutions that an administrator with only limited knowledge of the organization's internal operations would be hard-pressed to envisage. By giving general guidelines, regulators allow organizations with the greatest ability to self-regulate the choice of where and how to make reductions.

A key example of effective performance-based regulations and guidelines is the tobacco regulations promulgated by the Food and Drug Administration (FDA). In 1997, the tobacco industry settled a thirty-nine-state lawsuit regarding the marketing and sale of

[77] *See* PATRICK BERNHAGEN, THE POLITICAL POWER OF BUSINESS: STRUCTURE AND INFORMATION IN PUBLIC POLICY-MAKING 11–12 (2007) (describing how lobbyists apply their information asymmetry to influence political leaders and why policymakers are generally suspicious of such information).

[78] *See generally* Wendy E. Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L. J. 1619 (2004).

cigarettes.[79] In addition to paying "$368 billion over 25 years,"[80] the tobacco industry was forced to admit that nicotine was an FDA-regulable drug, a stance which it had vigorously opposed since the beginning of safety controls.[81] As a result, FDA was able to begin an aggressive regulation program on the sale and marketing of tobacco products.[82] Some of these regulations, such as a blanket ban on the sale of tobacco products to people under twenty-one years of age,[83] are command-and-control regulations. However, many of FDA regulations produced are standards rather than mandates. For example, enacted and proposed rules involving the regulation of menthols and nicotine levels in cigarettes give tobacco companies options in deciding how to deal with the emission of these chemicals.[84] These rules also provide a further incentive: if a company can produce evidence that their product is not as addictive or hazardous to user health, then the company can file a Modified Risk Tobacco Product application with FDA.[85] If this application is granted, the company will be allowed to include marketing claims in packaging that are atypical of a normal cigarette carton such as "95% less

[79] *See* Martine Costello, *Tobacco Deal Reached: State Negotiators and Cigarette Industry Finalize a Historic Pact,* CNN MONEY (June 20, 1997), https://money.cnn.com/1997/06/20/companies/tobacco_settlement/.

[80] *Id.*

[81] *See id.*

[82] *See Selling Tobacco Products in Retail Stores*, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/tobacco-products/retail-sales-tobacco-products/selling-tobacco-products-retail-stores (last updated Apr. 29, 2021) (providing an example of one of the many restrictions which FDA now places on point-of-sale transactions of tobacco in retail stores).

[83] *See Newly Signed Legislation Raises Federal Minimum Age of Sale of Tobacco Products to 21*, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/tobacco-products/ctp-newsroom/newly-signed-legislation-raises-federal-minimum-age-sale-tobacco-products-21 (last updated Jan. 15, 2020).

[84] *See* Tobacco Product Standard for Menthol in Cigarettes, 87 Fed. Reg. 26434 (May 4, 2022); *see also* Tobacco Product Standard for Nicotine Level of Combusted Cigarettes, 83 Fed. Reg. 11818 (Mar. 16, 2018) (setting a lower "cap" on nicotine allowed in a product but not regulating the internal architecture or features of the cigarette).

[85] *See Modified Risk Tobacco Products*, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/tobacco-products/advertising-and-promotion/modified-risk-tobacco-products#Overview (last updated Mar. 16, 2023).

nicotine compared to conventional cigarettes."[86] Therefore, performance-based initiatives can also provide incentives to the firm to make the most efficient changes.

B. *Use in Environmental Regulations*

In contrast to command-and-control regulations, performance-based reforms remove the "what to change" of environmental regulation from the hands of the government regulators and vest the decision-making power in the regulated parties. For one production plant, for example, this decision may be changing equipment to more environmentally conscious products, whereas another plant may change the process itself. The presumption is that these companies, as rational actors, will be able to make decisions which minimize implementation costs because of their superior knowledge of the process while still meeting the standards set by the government.

This implementation of performance-based regulations is a major benefit of the scheme since it is effective and carries mutual benefit: the agency does not need as much data from each affected company to create a cohesive energy policy, and industry can create an individualized and cost-effective plan.[87] However, if regulators make the standard too strict, it will be either economically burdensome or ineffective. Because of the power which setting environmental standards holds, there is significant strategizing done in crafting regulations which can influence the location decisions or outputs of certain firms.[88]

Another problem with a performance standard relates to achievability regarding minimizing environmental harms: if a standard is too lenient or "weak," there is little incentive for a firm to reduce to a socially and ecologically optimal level, and this may even be by design.[89] Environmental regulations can spur the

---

[86] *See* Letter from Matthew R. Holman, Dir., Off. of Sci., Ctr. for Tobacco Prods., to Karen Delaney, Program Manager, U.S. Food & Drug Admin., (Dec. 23, 2021) https://www.fda.gov/media/155092/download.

[87] *See* Robert N. Stavins, *Market-Based Environmental Policies*, *in* PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION 31, 33 (Paul R. Portney & Robert N. Stavins eds., 2000).

[88] *See* Scott Barrett, *Strategic Environmental Policy and International Trade*, 54 J. PUB. ECON. 325, 326–27 (1994).

[89] *See* DAVID M. DRIESEN, THE ECONOMIC DYNAMICS OF ENVIRONMENTAL LAW 71 (2002); Barrett, *supra* note 88, at 325–27 (describing how governments

development and use of innovative technologies when building new energy-generating properties, while also encouraging the retirement of less-efficient (albeit cheaper to operate) technologies.[90] An example of this can be found in the nuclear power industry, wherein there are different "generations" of plants with varying levels of efficiency. If the stringency of regulations is significantly increased, plants that may have been designed to run for a longer period are likely to be decommissioned early. This reaction may not be the cleanest option due to the emissions needed to construct an entirely new plant.[91] Ultimately, however, a consistent performance standard provides flexibility for firms and regulators that may allow for expansion and improvements long-term for the benefit of all parties involved. However, performance standards still suffer from a similar "bar-setting" problem as command-and-control schemes. The goal of a firm is to meet the standard, even if there would be social benefits to going further than that goal set out by the administration.

IV. INCENTIVE-BASED REGULATORY SYSTEM

A. *Overview of Incentive-Based Regulations*

Incentive-based regulations are not a new concept in environmental law, but they have become increasingly important in the past few decades. An incentive-based regulation is one that provides an inducement for a regulated firm to meet a certain standard. The voluntariness and the reward for success are the primary distinctions between incentive-based and the preceding compliance schemes. Unlike with the hard-and-fast rules of command-and-control or a performance standard, firms can ignore a true regulatory incentive. However, the benefits to compliance, such as favorable tax concessions or economic rewards, often lead to high participation.

may change their environmental standards in order to gain a competitive advantage in certain industries).

[90] *See* Marit E. Klemetsen et al., *Can Direct Regulations Spur Innovations in Environmental Technologies? A Study on Firm-Level Patenting*, 120 SCANDINAVIAN J. ECON. 338, 364 (2016).

[91] If a plant is decommissioned before its working life is over, the cost of carbon which was to be spread out over many years is then pushed into only the shorter working years of the plant. If a plant's construction took 100 tons of carbon and was projected to last for 20 years, it would cost 5 tons/year. However, if the plant is decommissioned after only 10 years, the cost of the construction would only be able to be spread out over 10 years, making it cost 10 tons/year.

Incentive-based regulations cannot be effectively compulsion but they are able to weigh a firm's actions towards an agency's desired outcome.[92]

Incentive-based regulation has become increasingly common in other areas of law from which environmental law borrows heavily. FDA's Modified Risk Tobacco Product application for cigarettes described above is a regulation that can be thought of as incentivizing companies to modify their behavior; tobacco companies that reduce the amount of nicotine beyond the amounts stated in the current FDA rule will be allowed to put claims on their labeling which may have the effect of boosting sales and market share.[93] This economic boon would provide a more compelling reason to create a low-nicotine cigarette than the current agency performance standard such that the introduction of this product to the market could reduce the overall use and resulting harm caused by nicotine.

Additionally, an example of the convergence of incentives and policy is the Securities and Exchange Commission's self-reporting system.[94] If a firm self-reports, complies with, or otherwise assists a federal investigation into its own practices, the final charges that the firm would receive may decrease proportionate to its assistance.[95] This policy provides an economic incentive to the companies to report their own violations, which they do with regularity.[96] Since these incidents are self-reported rather than needing to be uncovered, the Securities and Exchange Commission saves significant

[92] *See* Massachusetts v. Mellon*,* 262 U.S. 447, 482 (1923) ("If Congress enacted [the statute] with the ulterior purpose of tempting them to yield, that purpose may be effectively frustrated by the simple expedient of not yielding.").

[93] *See Modified Risk Tobacco Products*, *supra* note 85.

[94] *See, e.g.*, *Statement on the Relationship of Cooperation to Agency Enforcement Decisions, Exchange Act Release No. 44969*, SEC (Oct. 23, 2001), https://www.sec.gov/litigation/investreport/34-44969.htm.

[95] *See id.* The SEC has a variety of options to choose from when dealing with a cooperative firm, including the taking of no enforcement action, reducing the charges the SEC is seeking, lightening the sanctions, or including mitigating language in their legal actions.

[96] *See* Andrew Ceresney, Dir., SEC Div. of Enf't, The SEC's Cooperation Program: Reflections on Five Years of Experience 6 (May 13, 2015).

administrative costs with the need for less in-depth investigations while still bringing these types of unsavory practices to light.[97]

EPA took notice of this new approach used in other government agencies and added the incentive-based approach to its regulatory toolkit. Perhaps it saw incentives as enabling the grant of increased control to regulated firms, which was appreciated in business circles and thereby made it easier to impose, while still allowing administrators to hold the ultimate power in how much to regulate. Additionally, incentive-based regulations provide increasing advantages that may prompt regulated entities to make greater efforts to reduce emissions more than specifically required. First, they enable setting a standard that is both effective at reducing harm while ensuring that compliance is not economically prohibitive.[98] This result occurs because if a company believes that further agency regulation of its pollution is possible and the given incentive provides enough long-term (financial) benefits to outweigh the short-term (financial) losses, it will implement changes to meet the regulation.[99] For companies, exceeding the standards may even prove

[97] *See* Louis Kaplow & Steven Shavell, *Optimal Law Enforcement with Self-Reporting of Behavior*, 102 J. POL. ECON. 583, 583–85 (1994).

[98] *See* Bill Fotsch & John Case, *The Key to an Effective Incentive Plan*, FORBES (May 15, 2018), https://www.forbes.com/sites/fotschcase/2018/05/15/the-key-to-an-effective-incentive-plan/?sh=43c09f0e31a7 (describing the implementation of incentive plans in the business context, which involves a similar thought process to policy incentives). The goal of an incentive plan is to "affect people's behavior on the job," which is true both in a business and a policy context. While an incentive-based policy in a workplace involves regulating personal behavior and policies generally deal with market participants, the goal in both is to change the behavior of the actors in the given space to align with the policy-setter's goals.

[99] *See* Peter M. Kort, *Pollution Control and the Dynamics of the Firm: The Effects of Market-Based Instruments on Optimal Firm Investments*, 17 OPTIMAL CONTROL APPLICATIONS & METHODS 267, 268–300 (1996). Cost-benefit analysis is an important part of the American regulatory structure, requiring the "conversion" of many non-economic factors into economic concerns. While not the only way to analyze regulation, it is prominent in the United States. *See* Cass R. Sunstein, *Cost-Benefit Analysis and the Environment*, 115 ETHICS 351, 351–85 (2005).

useful as a marketing tool for environmentally friendly consumers.[100]

Incentives allow for standards to be set while still maintaining similar levels of effectiveness by encouraging voluntary reduction.[101] The "cap-and-trade" system (which sets a global emissions standard that all plants must follow and those that exceed that standard of compliance gain tradeable "credits" which hold a value of exchange) demonstrates the power of incentive and market-based reform.[102] It makes both newer and older plants cheaper to run because companies can receive payments for their credits or purchase credits for a less efficient plant that might not be able to meet regulations under command-and-control or performance standards.[103] Since systems such as cap-and-trade have proved enduring,[104] regulators and industry should determine and examine, respectively, the assumptions factoring into the incentive system calculations. This is especially relevant in the environmental law space because novel studies on the effects of certain chemicals are certain to come out and new political administrations may have very different views on what a valid standard entails.

---

[100] *See* Mahabubur Rahman et al., *The Product-Market Performance Benefits of Environmental Policy: Why Customer Awareness and Firm Innovativeness Matter*, 29 BUS. STRATEGY & ENV'T 2001, 2004–07 (2020).

[101] The goal of incentives is to create overall reductions but the regulator need not specify which firm must reduce by what standard. *See Economic Incentives*, EPA, https://www.epa.gov/environmental-economics/economic-incentives (last updated Sept. 8, 2022) ("Marketable permits, for example, set the total level of pollution control, but the market determines which polluters reduce emissions. On the other hand, taxes let the market determine the extent of control by individual polluters and the total level of control.").

[102] *See* JONATHAN L. RAMSEUR, CONG. RSCH. SERV., IF11103, A BRIEF COMPARISON OF TWO CLIMATE CHANGE MITIGATION APPROACHES: CAP-AND-TRADE AND CARBON TAX (OR FEE) 2 (2021).

[103] *See* JONATHAN L. RAMSEUR, CONG. RSCH. SERV., RL34436, THE ROLE OF OFFSETS IN A GREENHOUSE GAS EMISSIONS CAP-AND-TRADE PROGRAM: POTENTIAL BENEFITS AND CONCERNS 2 (2008).

[104] A mandatory cap-and-trade program now exists between 11 states and has been in operation for over a decade in the United States, with some programs in the European Union being nearly two decades old. *See Cap and Trade Basics*, CTR. FOR CLIMATE & ENERGY SOLS., https://www.c2es.org/content/cap-and-trade-basics (last visited Apr. 15, 2023).

Incentive-based regulations necessarily assume that there is creative momentum toward generating innovative and efficient ways to reduce pollution, which is not always the case. While providing a monetary incentive can spur change, command-and-control regulations may be a more effective solution when a specific promising method is identified, as discussed in Part II.B above. Another problem with incentives in regulation is political; what one person calls an "incentive," another may call a "gift" or "giveaway."[105] Additionally, although performance-based standards may not work as effectively in increasing the social surplus, they require less oversight because what is regulated is production data rather than production itself. Lastly, by making important regulatory decisions voluntary, regulatory effectiveness may decrease. An agency must balance these considerations when creating a regulatory system to ensure its goals are met, industry firms retain economic competitiveness, and political and legal backlash are minimized.

B. *A Case Study on Regulatory Schemes: Santiago, Chile*

One of the most complete and encompassing studies on the effects of different regulatory schemes on air pollution was written by Raúl O'Ryan and José Miguel Sánchez.[106] In it, they lay out the differences in net benefits on air quality for three different systems of regulation: an emissions standard (a command-and-control regulation that sets a specific amount), an emissions permit system (which give countries the right to generate a certain amount of emissions and can be traded on a one-to-one basis), and an ambient permit system (an emissions permit system where the "cost" of the emission is based on the location, making the "credit"—which can be

[105] *See generally* Emily Chung, *How Much Are Taxpayers Really Subsidizing Canada's Fossil Fuel Industry?,* CAN. BROAD. CORP. (Mar. 9, 2022), https://www.cbc.ca/news/science/fossil-fuel-subsidies-expaliner-1.6371411; Sujatha Bergen & Susan Casey-Lefkowitz, *Fossil Fuel Subsidies in 2021? Give Taxpayers a Break.*, NAT'L RES. DEF. COUNCIL (Apr. 6, 2021), https://www.nrdc.org/bio/susan-casey-lefkowitz/fossil-fuel-subsidies-2021-give-taxpayers-break; David Carlin, *A 5 Trillion Dollar Subsidy: How We All Pay for Fossil Fuels*, FORBES (June 2, 2020), https://www.forbes.com/sites/davidcarlin/2020/06/02/a-5-trillion-dollar-subsidy-how-we-all-pay-for-fossil-fuels/?sh=114f86437ea1 (using the language of "gift" and "giveaway").

[106] *See generally* Raúl O'Ryan & José Miguel Sánchez, *Comparison of Net Benefits of Incentive-Based and Command and Control Environmental Regulations: The Case of Santiago, Chile*, 22 WORLD BANK ECON. REV. 249 (2008).

bought and sold—more or less valuable).[107] The paper concludes that the ambient permit system is typically less efficient in achieving its aims than either the emissions permit or the emissions standard.[108] While it is much less expensive to implement than the other two systems due to less economic disruption, the flexibility of the ambient permit system made it less effective because emissions could simply be reorganized to meet the new standards.[109] The end result of ambient emissions standards can be significant reductions in emissions in some areas and next to none in others.[110]

While this example happened in a city, it has global implications. The increase in permit systems allows certain wealthy countries to "buy" their way into compliance with the Paris Accords—a multi-national agreement wherein countries committed to the creation of nationally-determined contributions designed to reduce global greenhouse gas (GHG) emissions—by purchasing credits from less industrialized countries.[111] This means they may or may not reduce pollution, but instead possibly relocate it to other parts of the world with lower GHG emissions through market leakage.[112] Thus, what is required on the global scale to combat climate change is not only an incentives system to increase cost-effectiveness, but also a universal emissions standard which reduces emissions worldwide. The members of the Organization for Economic Co-Operation and Development (OECD)—an international policy organization with a focus on social, economic, and environmental

107 *See id.* at 250–52.

108 *See id.* at 260–67.

109 *See id.*

110 *See id.* at 266–67.

111 *See* Ed Scott-Clarke & Max Burnell, *The Carbon Offset Market Could Be Worth $200 Billion by 2050. But What Is It?*, CNN BUS. (Oct. 18, 2021), https://www.cnn.com/2021/10/18/business/carbon-offsets-climate-explainer/index.html; Nicholas Kusnetz, *Carbon Credits Likely Worthless in Reducing Emissions, Study Says*, INSIDE CLIMATE NEWS (Apr. 19, 2017), https://insideclimatenews.org/news/19042017/cabon-emissions-credits-paris-climate-agreement/ (discussing a report on the approved credit schemes which approved ways to reduce emissions in the Paris Agreements).

112 *See* Jesse Klein, *In the Quest for Carbon Offsets, (Almost) Anything Goes*, GREENBIZ (Nov. 30, 2020), https://www.greenbiz.com/article/quest-carbon-offsets-almost-anything-goes.

challenges[113]—have recently shown an increased willingness to work together on taxation issues, with a major development on a global corporate tax in 2021.[114] Creating a global carbon tax may take just as much time and international effort as it did to create the global corporate tax (almost thirty years have passed between the first European Union committee proposing a corporate tax rate in 1992 and the OECD tax being adopted in 2021) but it would be an incredibly important command-and-control regulation around which other incentive systems could be structured.[115] By creating this dual system, the program could both ensure a set amount of carbon reduction without leakage through the global carbon tax and allow for increased reduction through the incentives system.

C. *The Resilience of Environmental Disincentives: The Cost of Carbon*

By introducing environmental metrics into incentives systems, such as the social cost of carbon (SCC), a greater reduction in GHGs can be achieved. The SCC is a metric used by executive agencies in the United States to price in the negative externalities of the marginal production of GHGs.[116] Executive administrations task agencies with examining the SCC when looking at the costs of policies in order to properly account for any possible environmental harm the policy may produce.[117] While the SCC is important to regulators when considering the effects of potential programs, the actual cost per ton has fluctuated with the executive administrations' changes

[113] *See About*, OECD, https://www.oecd.org/about/ (last visited Oct. 17, 2023).

[114] *See* Julia Horowitz, *President Biden Wins Global Support for Massive Tax Overhaul*, CNN BUS. (July 2, 2021), https://www.cnn.com/2021/07/01/economy/global-minimum-tax-agreement/index.html.

[115] *See* Ludvig Wier, *Tax Havens Cost Governments $200 Billion a Year. It's Time to Change the Way Global Tax Works*, WORLD ECON. F. (Feb. 27, 2020), https://www.weforum.org/agenda/2020/02/how-do-corporate-tax-havens-work/ ("This was already suggested by the EU Commission's Ruding Committee in 1992, which proposed a minimum EU corporate tax rate of 30%.").

[116] *See generally* William D. Nordhaus, *Revisiting the Social Cost of Carbon*, 114 PROCS. NAT'L ACAD. SCIS. 1518 (2017).

[117] *See* Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates Under Executive Order 13990, 86 Fed. Reg. 24669 (May 7, 2021).

in policy.[118] The Biden administration's EPA's interim value for the SCC is $51 per ton, which is ten times the Trump administration's EPA's valuation[119] (which had reduced it to between thirteen percent at the high end and only two percent at the low end of what it was under Obama's administration).[120] However, the Biden Administration's EPA has proposed increasing that number up to $190 per ton to account for other externalities, such as human lives lost due to climate change.[121] If an incentive system based on the SCC were to pay out credits based on how much carbon was saved, these three administrations would have extreme fluctuations in how much GHGs were reduced. However, this may not be as harmful as it sounds. Unlike command-and-control or performance-based mandates, an incentive-based system is adaptable and can change based on the assumptions underlying it. Therefore, a savvy administrator may want to create an incentive-based system because it may be better able to withstand the inevitable political shifts that tend to threaten environmental policy.[122] Thus, while the effectiveness of

[118] *See* Heather Boushey, *A Return to Science: Evidence-Based Estimates of the Benefits of Reducing Climate Pollution*, THE WHITE HOUSE (Feb. 26, 2021), https://www.whitehouse.gov/cea/written-materials/2021/02/26/a-return-to-science-evidence-based-estimates-of-the-benefits-of-reducing-climate-pollution/. Also note that the SCC is used to signal the strenuousness of administrative regulations under a given administration because of carbon's importance to GHG emissions. *See also Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates Under Executive Order 13990*, THE WHITE HOUSE 2 (Feb. 2021), https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf.

[119] *See* Jason Bordoff, *Trump v. Obama on the Social Cost of Carbon—and Why It Matters*, WALL ST. J. (Nov. 15, 2017), https://www.wsj.com/articles/trump-vs-obama-on-the-social-cost-of-carbonand-why-it-matters-1510769071; *Biden Administration Revamps Social Cost of Carbon*, COLUM. CLIMATE SCH., https://climate.law.columbia.edu/content/biden-administration-revamps-social-cost-carbon (last visited July 8, 2023).

[120] *See* Bordoff, *supra* note 119; *Biden Administration Revamps Social Cost of Carbon*, *supra* note 119.

[121] *See* Rebecca Hersher et al., *EPA's Proposal to Raise the Cost of Carbon is a Powerful Tool and Ethics Nightmare*, NPR (Feb. 9, 2023) https://www.npr.org/2023/02/08/1155544378/epas-proposal-to-raise-the-cost-of-carbon-is-a-powerful-tool-and-ethics-nightmar.

[122] *See generally* Jessica Hejny, *The Trump Administration and Environmental Policy: Reagan Redux?* 8 J. ENV'T STUDS. & SCIS. 197 (2018).

the policy may change, the stability that it imposes on the market remains. As a stabilizing force, an incentive-based system can be changed to fit with the goals of the current administration, and these goals can be supplemented with the adoption of other measures to induce behaviors such as subsidies.

V. SUBSIDIES AS AN INCENTIVE-BASED SYSTEM

A. *Introduction to Subsidies and Environmental Law*

Subsidies are, at their core, the provision of certain inducements—usually monetary—to change actors' behavior.[123] In this way, they can be used in an incentive-based system to increase the supply of a given material,[124] which may affect price.[125] For example, a subsidy could encourage the domestic production of a certain commodity that would otherwise be economically infeasible to produce.[126] Subsidies are typically used by states to indirectly produce shifts in private behavior to align the market with the goals and policies of the subsidy-producing country.[127] In environmental law, incentive-based regulations, including subsidies, are usually discussed as an academic theory.[128] However, even as far back as the

123 *See* R.W. Gannon et al., *Goal-Oriented Agricultural Water Quality Legislation*, 32 J. AM. WATER RES. ASS'N 437, 442 (1996) (examining subsidies as one of many "goal oriented" incentives); *see also* Simon Lester, *The Problem of Subsidies as a Means of Protectionism: Lessons from the WTO EC-Aircraft Case,* 12 MELBOURNE J. INT'L L. 1, 4 (2011).

124 *See generally* Gert Janssens & Georges Zaccour, *Strategic Price Subsidies for New Technologies*, 50 AUTOMATICA 1999 (2014) (finding that R&D and supply factors shift availability of technology); EMMA HUTCHINSON, PRINCIPLES OF MICROECONOMICS 219–35 (2016).

125 *See* Janssens & Zaccour, *supra* note 124, at 4 ("The ultimate goal of price subsidies is precisely to obtain competitive prices sooner.").

126 *See* Lester, *supra* note 123, at 4.

127 *See* Timothy J. Kehoe & Jaime Serra-Puche, *A General Equilibrium Analysis of Price Controls and Subsidies on Food in Mexico*, 21 J. DEV. ECON. 65, 65 (1986) ("Our results [studying price controls] indicate that, although food subsidies need to be reduced, maintaining some subsidies would have a favorable impact on income distribution.").

128 *See, e.g.*, Toke Skovsgaard Aidt & Jayasri Dutta, *Transitional Politics: Emerging Incentive-Based Instruments in Environmental Regulation*, 47 J. ENV'T. ECON. & MGMT. 458, 458–59 (2004); Alan Randall & Michael A. Taylor, *Incentive-Based Solutions to Agricultural Environmental Problems: Recent*

H.W. Bush administration, bipartisan studies and congressional bills have considered applying "economic-incentive mechanisms to problems as diverse as water pollution and hazardous waste management."[129]

B. *Restrictive Quotas and Subsidies*

While less disruptive than direct government action, incentive-based subsidies matched with a quota—a government or otherwise imposed production restriction—will result in a supply change.[130] One of the chief problems with a private agreement that restricts parties' production is the risk of shirking.[131] Shirking occurs when individual producers bound by a quota have a significant incentive to produce more than their allotted share of the limited good. In such an agreement, the good's price would be "set" at a price where there is a profit for most parties in order to encourage economic cooperation. (This is in contrast to producer operations in a free market system, in which they will continue to produce until demand brings the price down to the optimal amount, at which point it remains constant.[132]) These types of terms and dynamics exist in oligopolistic markets, such as the Organization of Petroleum Exporting Countries (OPEC).[133] Countries in the OPEC come together to set an amount

Developments in Theory and Practice, 32 J. AGRIC. & APPLIED ECON. 221, 221–22 (stating that Incentive-Based regulations are a recent development).

[129] *See* Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea?*, 18 ECOLOGY L. Q. 1, 2–3 (1991).

[130] *See generally* Daniel A. Sumner & Christopher A. Wolf, *Quotas Without Supply Control*: *Effects of Dairy Quota Policy in California*, 78 AM. J. AGRIC. ECON. 354, 354 (1996) (describing how the California Milk marketing quota generates "more producer surplus and smaller welfare losses than a federal-style program without quota" by affecting the supply of milk into the market).

[131] As an example, shirking has been studied in the context of employment law. *See generally* George Bulkley & Gareth D. Myles, *Trade Unions, Efficiency Wages, and Shirking*, 48 OXFORD ECON. PAPERS 75, 75 (1996) (stating that "provid[ing] workers with an incentive not to shirk has aroused widespread interest" and "that it is costly for the worker to expend effort on the job (taking the wage and then shirking is preferred)").

[132] *See* Madhuri Thakur, *Market Equilibrium*, EDUCBA, https://www.educba.com/market-equilibrium/ (last visited Apr. 16, 2023).

[133] *See generally* Sel Dibooglu & Salim N. AlGudhea, *All Time Cheaters vs. Cheaters in Distress: An Examination of Cheating and Oil Prices in OPEC*, 31 ECON. SYS. 292 (2007).

of oil that they will each drill in order to keep prices high and ensure significant profits.[134] However, many countries overproduce oil contrary to the agreement,[135] which can lead to the price falling below the agreed-upon rate. By only having a restrictive quota without any incentive or enforcement mechanism, it can be difficult to achieve widespread compliance.

To solve the problems associated with restrictive quotas, the U.S. federal government added incentive-based regulations and price controls to ensure compliance. A famous environmental law case challenging the use of a restrictive production agreement—the Agricultural Adjustment Act of 1938—is *Wickard v. Filburn*.[136] As part of his New Deal policies, President Franklin D. Roosevelt sought to address the consistently low price of foodstuffs and a continuing "race to the bottom" among producers that was hurting the income of farmers.[137] Because many American farms relied on a mono-culture method of planting,[138] in which they produced a single type of crop which usually "benefit[ed] from higher profits,"[139] any dip in the price of a commodity would directly impact the farmers' wages. To maintain a sufficient price, the Roosevelt administration provided a subsidy to farmers who grew *less* wheat.[140] Farmers

134 *See* Charles Issawi, *The 1973 Oil Crisis and After*, 1 J. POST KEYNESIAN ECON. 3, 3 (1978) ("Their action was highly profitable: it is netting them, at present, some $130 billion a year."). For examples of cuts happening recently, see Maha El Dahan & Ahmed Rasheed, *OPEC+ Announces Surprise Oil Output Cuts*, REUTERS (Apr. 2, 2023), https://www.reuters.com/business/energy/sarabia-other-opec-producers-announce-voluntary-oil-output-cuts-2023-04-02/.

135 *See* Dibooglu & AlGudhea, *supra* note 133, at 292–93.

136 *See generally* Wickard v. Filburn*,* 317 U.S. 111 (1942).

137 *See id.* at 126. For an explanation of a "race to the bottom" and its destructive nature to workers and producers, *see* James Chen, *What Is the Race to the Bottom?*, INVESTOPEDIA, https://www.investopedia.com/terms/r/race-bottom.asp#:~:text=The%20race%20to%20the%20bottom%20refers%20to%20a%20competitive%20situation,)%2C%20or%20reducing%20labor%20costs (last updated Oct. 3, 2022).

138 *See* J.F. Power & R.F. Follett, *Monoculture*, 256 SCI. AM. 78, 79 (1987) (describing the process of monoculture and its historical development).

139 Peter Kogut, *Monoculture Farming in the Agriculture Industry*, EOS DATA ANALYTICS (Oct. 20, 2020), https://eos.com/blog/monoculture-farming/.

140 *See* Agricultural Adjustment Act, 7 U.S.C. §§ 601–627 (1933). By cooperating with the Agricultural Adjustment Program, farmers were secured a stable and higher-than-market price for their wheat through government subsidies. The

were paid to reduce their output of the crop, which kept prices high enough that they could make good wages on their harvests. This subsidy was a policy-focused incentive system that complemented the quota: it stabilized the price of wheat, sustained the livelihoods of depression-era farmers, and prevented shirking through financial inducement and rigorous enforcement. Subsidies were thus used as an important inducement for participation in what would otherwise be an unpopular government program.

In response to the Agricultural Adjustment Act, Roscoe Filburn, a farmer who had produced more than his quota of wheat, sued the Secretary of Agriculture.[141] While Filburn did not sell the extra wheat but, rather, grew it for personal use, the Supreme Court still ruled against him and upheld the fine.[142] The Court reasoned that if all producers grew too much wheat, then it would affect market commerce by reducing demand and, thus, price.[143] *Wickard* thereby describes why regulators also need enforcement power to fully realize their goals; without a way to police the agreement between farmers and the state, each farmer may produce more than their allotment to turn a profit and benefit additionally from the subsidy.

To ensure that profit-seeking behavior is curtailed, regulatory enforcement must exist and be effective in surveilling and punishing noncompliance. Some producers may be scared away from wrongdoing by the possibility of punishment.[144] However, many people will attempt cost-benefit analysis to determine the best course of action. A rational person under a restrictive production agreement would likely choose to forego additional production when the profit of additional crops is less than (P x M), where P is the probability of the government finding out about the illegal conduct and M is the

"catch" was that by subscribing to the AAP, the farmers were consenting to the regulation that they would only grow a certain amount of the crop. *See also Wickard*, 317 U.S. at 126–31. ("[P]roducers who cooperated with the Agricultural Adjustment Program received an average price on the farm of about $1.16 a bushel . . . . It is hardly lack of due process for the Government to regulate that which it subsidizes.").

141 *See Wickard*, 317 U.S. at 113.

142 *See id.* at 130.

143 *See id.* at 127–28.

144 *See generally* Eberhard Feess et al., *The Impact of Fine Size and Uncertainty on Punishment and Deterrence: Theory and Evidence from the Laboratory*, 149 J. ECON. BEHAV. & ORG. 58 (2018).

average monetary penalty assessed. The regulation's effectiveness (or, at least, how it is perceived) will be impacted by the risk of punishment.

C. *Negative Incentives*

Regulatory compliance ultimately requires both proactive and reactive actions by the regulator but, even when those actions occur, compliance may be imperfect. One challenge is producing an adequate penalty, also called a negative incentive.[145] If a penalty is set too low or is non-existent, it will not effectively restrict behavior, so firms will shirk their statutory obligations.[146] For example, an individual with diplomatic immunity may let their parking tickets stack up since there are no consequences to not paying.[147] In contrast, if a penalty is set too high to compensate for lackluster enforcement, there will be general discontent among the regulated community because of perceived "arbitrariness."[148] Another problem is the cost of supervision: if it is too costly, supervision may be deficient and, if firms catch on, compliance will suffer. Conversely, the cost of an auditing force may outweigh the social good of the project, making it an inefficient solution to the initial problem.

Collective policing can also be achieved through an adequate compensation structure that incentivizes individuals to report breach

---

[145] *See* Uri Gneezy, *The W Effect of Incentives*, U. CHI. SCH. BUS. (Oct. 13, 2003) (defining negative incentives as "a non-monotonicity close to zero" and characterizing behavior under the incentives as an "economic reaction" when fines are increased).

[146] *See* Farber, *supra* note 6, at 301–05 (describing this problem as "negative slippage").

[147] *See* Michael Howard Saul, *Diplomats Dodge Old Debt*, WALL ST. J. (Sept. 22, 2014), https://www.wsj.com/articles/diplomats-dodge-old-debt-1411438396. However, this problem has been rectified in recent years through the use of other mechanisms to influence behavior. *See* Mack Hogan, *Diplomatic Immunity Won't Save You from Parking Tickets in New York*, JALOPNIK (June 19, 2018), https://jalopnik.com/diplomatic-immunity-wont-save-you-from-parking-tickets-1826861102 ("If [parking tickets are not paid], your car can be towed, your registration renewal can be denied, your plates can be confiscated and some of the foreign aid your country receives might be withheld.").

[148] *See generally* Lars P. Feld & Bruno S. Frey, *Tax Compliance as the Result of a Phycological Tax Contract: The Role of Incentives and Responsive Regulation*, 29 LAW. & POL'Y 102, 107 (2007) ("In the case of arbitrary procedures, taxpayers feel helpless and get the impression that they are not taken seriously.").

of compliance information. A good domestic example of this incentive-based reporting scheme is the Securities and Exchange Commission's and Commodity Futures Trading Commission's "whistleblower program," which provide a cut of all recovered assets of illegal activity to the tipster.[149] This allowance makes the disclosure of information to the regulatory body profitable to the tipster and helps the government recover the assets.[150] While there are issues with ensuring that the reporting party did not also profit already from the guilty conduct and granting payouts, which can be quite costly, agencies such as the Securities and Exchange Commission and Department of Justice regard these systems as an effective way of policing agreements and reducing governmental burden.[151] By properly compensating firms that report wrongdoing, the government increases the probability of punishment for noncompliance, thereby deterring improper behavior.[152] Expanding beyond command-and-control schemes and integrating incentive-based thinking into multi-party agreements would reduce the government's cost of maintaining regulatory schemes, encourage self-regulation, and promote the regulatory regime's overall effectiveness. Similarly, adding "whistleblower" incentives to environmental policies may increase the efficacy of regulations and reduce the need for costly investigations, but the statutory authorization for this type of regulation could face implementation challenges.

149 *See* Yehonatan Givati, *Of Snitches and Riches: Optimal IRS and SEC Whistleblower Rewards*, 55 HARV. J. ON LEGIS. 105, 112–19 (2018); *see also The Whistleblower Program*, COMMODITY FUTURES TRADING COMM'N, https://www.whistleblower.gov (last visited July 14, 2023).

150 *See The Whistleblower Program*, *supra* note 149; *see also Office of the Whistleblower,* SEC. & EXCH. COMM'N, https://www.sec.gov/whistleblower (last modified Apr. 11, 2023).

151 See Givati*, supra* note 149, at 130–34 (noting how self-reporting saves the agencies many hours of possible investigatory work into problems but also discussing the possibility that whistleblowers undesirably profit from noncompliance).

152 *See id.* at 123 (stating that the goal of the policymaker "is to deter undesirable activity with the lowest possible reward"). For a more mathematical expression of firm behavior, see *id.* at 125–28, describing an equation for deterrence based on cost-benefit analysis.

D. *Historical "Positive" Subsidies in Agricultural Industries*

While restrictive agreements and complementary subsidies that incentivize less production have enjoyed limited success, incentives to expand production have been more popular and effective. The type of restrictive agreement discussed in *Wickard* is rarely found in modern environmental regulations because it requires either very few producers working in tandem (e.g., the OPEC) or a single producer with a prohibitive market share (e.g., De Beers[153]). Production-side regulatory subsidies are much more common in the United States, especially in the agricultural and natural resource extraction industries. However, while subsidies can be powerful mechanisms for successful market regulation, they can also cause significant environmental harm if not properly planned.[154]

The use of positive subsidies in the American fossil fuels and agricultural industries, specifically for sugar, oil, and natural gas production, exemplifies the destructive nature of the allowances. Sugar is one of the key cash crops of the United States,[155] mainly grown in the Deep South and Hawai'i.[156] In Hawai'i, where sugar cultivation historically did not have to compete against cotton plantations for prime agricultural land,[157] sugar became a significant

153 *See, e.g.*, Cyrlene Claasen & Julia Roloff, *The Link Between Responsibility and Legitimacy: The Case of De Beers in Namibia*, 107 J. BUS. ETHICS 379, 382 (2012) ("For many decades, De Beers [a single company with control of many of the diamond mines in Africa] dominated the diamond market holding a share of about 80%.").

154 *See* Cees van Beers & Jeroen C. J. M. van den Bergh, *Environmental Harm of Hidden Subsidies: Global Warming and Acidification*, 38 AMBIO 339, 339 (2009).

155 *See* Nader Soltani et al., *Potential Yield Loss in Sugar Beet Due to Weed Interference in the United States and Canada*, 32 WEED TECH. 749, 749 ("Sugar beet is a valuable cash crop grown mainly for sugar production in various regions of the United States and Canada. Sugar beet contains as much as 20% sugar by weight and is the source of 20% of the world's sugar supply.").

156 *See U.S. Sugar Production*, U.S. DEP'T OF AGRIC. ECON. RSCH. SERV., https://www.ers.usda.gov/topics/crops/sugar-and-sweeteners/background/ (last updated Oct. 19, 2021) ("In the United States, sugarcane is produced in Florida, Louisiana, and Texas.").

157 *See generally* C.K. McClelland & C.A. Sahr, *Cotton in Hawaii*, HONOLULU STAR-BULL., May 2, 1912 (a historical report on the problems with growing cotton, such as, "the profitableness of the sugar industry, the greater hardiness . . . of rice, sugar cane and pineapples, and . . . [crops] so badly infested with insects as

cash crop of the islands.[158] The United States influenced the adoption of the sugarcane crop in the Hawaiian Islands, which led to significant cost reductions in the United States.[159] while causing environmental chaos in Hawai'i.[160]

The "Big 5" American sugarcane companies (Castle & Cooke, Alexander & Baldwin, C. Brewer & Co., American Factors (also known as Amfac), and Theo H. Davies & Co.) were the primary industrial interests in Hawai'i in the nineteenth century.[161] They saw Hawai'i's rich tropical landscape as ideal for agriculture. Furthermore, the state was an important point of transport for specialized foodstuffs as the United States grew westwards towards Asia. As the American Civil War severed the Union's connections to its usual supply of cotton and sugar,[162] the cost of sugar spiked by over two

to be unprofitable"). For the contention that sugarcane is a "Cash Crop," *see Sugarcane Profile*, AGRIC. MKTG. RES. CTR., https://www.agmrc.org/commodities-products/grains-oilseeds/sugarcane-profile (last revised Apr. 2022) ("Sugarcane was one of the first 'cash crops' of early colonial America.").

158 *See* Barry Rigby, *The Origins of American Expansion in Hawaii and Samoa, 1865–1900*, 10 INT'L HIST. REV. 221, 222–23 (1988).

159 *See id.* at 222 (describing how the presence of U.S. agents in the Hawaiian Islands "locked Hawaii into a pattern of plantation development and [U.S.] sugar-market dependence"). The cost of sugar increased during the Civil War and then began to steadily decrease after 1870. This corresponds to when investment in industrial sugar production in Hawai'i began. *See The Sweet and Sour History of Sugar Prices*, WINTON (Apr. 6, 2017), https://www.winton.com/longer-view/the-sweet-and-sour-history-of-sugar-prices.

160 *See* William G. Cutler et al., *Bioaccessible Arsenic in Soils of Former Sugar Cane Plantations, Island of Hawaii*, 442 SCI. TOTAL ENV'T 177, 177 (2013).

161 *See* John P. Frank, *Ex Parte Milligan v. The Five Companies: Martial Law in Hawaii*, 44 COLUM. L. REV. 639, 644 (1944) (describing the "Big 5" companies in Hawai'i in the late 19th Century); s*ee Hawaiians Strike Against the Sugar Industry in Hawaii, 1946*, GLOB. NONVIOLENT ACTION DATABASE, https://nvdatabase.swarthmore.edu/content/hawaiians-strike-against-sugar-industry-hawaii-hawaii-1946 (last visited Oct. 17. 2023) (describing the makeup of the "Big 5" Companies in Hawai'i under the "Case Study Details" section).

162 Without the Confederate states' cotton, the Union and European industrial markets got creative with their supply chains. Important crops such as cotton had to be shipped from foreign locations, such as Egypt, which doubled its price. *See* Peter Schwartzstein, *How the American Civil War Built Egypt's Vaunted Cotton Industry and Changed the Country Forever*, SMITHSONIAN MAG. (Aug. 1, 2016) (noting how Egypt's cotton exports climbed from six hundred thousand cantars to 1.3 million from 1861 to 1865). Sugar was almost exclusively produced in the South due to the climate, with Louisiana producing "almost all of the sugar grown

hundred percent.[163] This lasting memory would lead to the development of an incentive program for Hawaiian sugar.

In 1875, Hawai'i and the United States signed the Reciprocity Treaty,[164] a free trade agreement at a time when protectionism by way of tariffs was the preferred business model.[165] Protectionism uses embargos and tariffs to increase the competitiveness of "domestic" industry.[166] Protectionist taxes on foreign goods are an indirect, positive subsidy for the domestic industry to produce more goods by forcing foreign competition to work significantly harder to be profitable in the market. This system can help foster the growth of an emerging domestic industry against foreign competition and a stimulation of capital formation.[167] Hawai'i's exemption from foreign protectionist tariffs transitioned Hawaiian sugar from "foreign" to "domestic," which led to the sugar exported from Hawai'i to balloon from twenty-four million pounds in 1874 to 330 million pounds by 1890.[168] This access stimulated demand, which subsequently generated production growth through new sugar plantations run by the "Big 5."[169] However, this sugar was still coming from an

in the United States during the antebellum period." *See Antebellum Louisiana II*, LA. STATE MUSEUM, https://www.crt.state.la.us/louisiana-state-museum/online-exhibits/the-cabildo/antebellum-louisiana-agrarian-life/index (2018).

163 *See* THEODORE MORGAN, HAWAII: A CENTURY OF ECONOMIC CHANGE, 1778–1876, at 180 (1948).

164 *See* John Patterson, *The United States and Hawaiian Reciprocity, 1867–1870*, 7 PAC. HIST. REV. 14, 14–15 (1938) (describing the reciprocity treaty of 1875 between Hawai'i and the United States as "a commercial and economic negotiation dominated by political motives.").

165 *See* Kate Farr, *Reciprocity Treaty of 1875*, DARTMOUTH U., https://www.dartmouth.edu/~hist32/History/S26%20-%20Reciprocity%20Treaty%20of%201875.htm (last visited Apr. 17, 2023).

166 For a general overview of the aims of protectionist policies, see *Protectionism: Examples and Types of Trade Protections*, INVESTOPEDIA, https://www.investopedia.com/terms/p/protectionism.asp (last modified Apr. 11, 2022). For an analysis of the costs of protectionism, see Robert C. Feenstra, *How Costly is Protectionism?*, 6 J. ECON. PERSPS. 159, 159–62 (1992).

167 *See* Bennett D. Baack & Edward John Ray, *The Political Economy of Tariff Policy: A Case Study of the United States*, 20 EXPLS. ECON. HIST. 73, 75–76 (1983).

168 *See* RALPH SIMON KUYKENDALL, THE HAWAIIAN KINGDOM—VOLUME 3: THE KALAKAUA DYNASTY 83 (1979).

169 *See* John M. Liu, *Race, Ethnicity, and the Sugar Plantation System: Asian Labor in Hawaii, 1850 to 1900*, *in* LABOR IMMIGRATION UNDER CAPITALISM:

area outside the United States, so it wouldn't benefit from positive incentives given to domestic producers. The 1890 McKinley Tariff was the Hawaiian sugar industry's worst nightmare: all "foreign" sugar was free of tariffs, making Hawai'i no longer special among international producers.[170] Additionally, there was a two-cent bounty given to all domestic producers to maintain the domestic industry, which the Hawaiian sugar producers were not granted.[171] American-aligned businesspeople on the islands successfully instituted a *coup d'état* in 1893, hoping for the annexation of Hawai'i that would permanently make Hawaiian sugar domestic. After considerable debate about taking this illegally seized land, the United States annexed Hawai'i in 1898 through the Newlands Resolution,[172] and its sugar would fuel America's sweet tooth for the next seventy years.

By making Hawaiian sugar "domestic" for the purposes of the American tariff system, U.S. officials incentivized economic, ecological, and political changes to the islands. Ecologically, sugar is a destructive and wasteful crop in part because it is extremely water-intensive.[173] Additionally, harvesting sugarcane requires twelve-hour days of backbreaking labor, which was then conducted primarily by East Asian migrant laborers.[174] Sugarcane production also required water and wood to create sugar mills, and planters extracted these resources from Hawai'i with abandon.[175] One planter drained

ASIAN WORKERS IN THE UNITED STATES BEFORE WORLD WAR II, at 186, 193–94 (Lucie Cheng & Edna Bonacich eds., 1984).

170 *See* Douglas A. Irwin, *Tariff Incidence: Evidence from U.S. Sugar Duties, 1890–1930* (Nat'l Bureau of Econ. Rsch., Working Paper No. 20635, 2014).

171 *See* Richard D. Weigle, *Sugar and the Hawaiian Revolution*, 16 PAC. HIST. REV. 41, 41 (1947).

172 *See* H.R.J. Res. 259, 55th Cong. (1898).

173 *See* Carol MacLennan*, The Mark of Sugar: Hawaii's Eco-Industrial Heritage*, 29 HIST. SOC. RSCH. 37, 40 (stating that sugar is "one of the world's thirstiest crops" and that after continued sugar farming "neither the industry nor the environment in Hawaii resembled its original self").

174 *See* Natasha Varner, *Strikers, Scabs, and Sugar Mongers: How Immigrant Labor Struggle Shaped the Hawai'i We Know Today,* DENSHO (Aug. 22, 2017), https://densho.org/catalyst/strikers-scabs-sugar-mongers-immigrant-labor-struggle-shaped-hawaii-know-today/ (stating that "by the turn of the century, [Japanese migrant laborers] had become the largest ethnic group on the islands").

175 *See, e.g.*, ARTHUR ALEXANDER, KOLOA PLANTATION 1835–1935, at 8, 56–57 (1985) (providing a general overview of inefficiencies in mill production, such

over six hundred acres of riparian land to create sugarcane.[176] During the 1800s, these environmental and human costs were disregarded in the pursuit of cheaper products.

Sugar subsidies are not a relic of the Gilded Age and show the market-altering power of the state's decision-making. The United States currently subsidizes the domestic production of sugar with $2.4 to 4 billion per year,[177] while simultaneously importing additional sugar under a strict system of tariff-rate quotas.[178] Under this system, each country can import a specific amount of sugar into the United States at a low tariff rate and further amounts at a higher rate.[179] Sugar prices in the United States are affected by this limitation in the supply chain and are roughly twice as much as in the rest of the world.[180] These systems support domestic sugar production (and thereby cater to sugar planters, who represent a powerful voting group).

The downsides of incentivizing domestic sugar production include environmental and socioeconomic harm.[181] For example, consider the Mississippi Delta region, where pesticide runoff from

as the draining of 600 acres of riparian land to create a sugar plantation before realizing the land was unsuited or that an entire cord of wood would need to be used to create molasses). For a more general overview of the ecological sugar production in Hawai'i and worldwide, see MacLennan, *supra* note 173; *Sugarcane Farming's Toll on the Environment*, WORLD WILDLIFE FOUND. (Summer 2015), https://www.worldwildlife.org/magazine/issues/summer-2015/articles/sugarcane-farming-s-toll-on-the-environment.

176 *See* ALEXANDER, *supra* note 175, at 56–57.

177 *See* Colin Grabow, *Candy-Coated Cartel: Time to Kill the U.S. Sugar Program*, CATO INST. (Apr. 10, 2018), https://www.cato.org/policy-analysis/candy-coated-cartel-time-kill-us-sugar-program (stating that the United States' pro-sugar policies "cost households and users between 2.4 billion and 4 billion a year" by artificially inflating the commodity price).

178 *See Sugar Import Program*, U.S. DEP'T OF AGRIC. FOREIGN AGRIC. SERV., https://www.fas.usda.gov/programs/sugar-import-program (last visited Apr. 3, 2023).

179 *See id.*

180 *See* Aaron O'Neill, *Monthly Prices for Sugar in the United States, Europe and Worldwide from January 2014 to June 2023*, STATISTA (July 13 2023), https://www.statista.com/statistics/673460/monthly-prices-for-sugar-in-the-united-states-europe-and-worldwide/.

181 *See* OLIVER D. CHEESMAN, ENVIRONMENTAL IMPACTS OF SUGAR PRODUCTION: THE CULTIVATION AND PROCESSING OF SUGARCANE AND SUGAR BEET 17–19 (2004).

sugarcane has caused the mass death of fish in the Delta.[182] Furthermore, favoritism of the sugar industry harms related industries: the Department of Commerce estimates that three confectionary manufacturing jobs are lost for each growing or harvesting job in the sugar industry saved.[183] The subsidy of sugar—while undoubtedly effective in encouraging production—has caused severe ecological harm in Hawai'i and the Mississippi Delta region, and disrupted the already-existing sugar industry and other agricultural efforts of America, demonstrating the potential negative effects of incentive-based systems.

E. *"Implicit" Subsidies: Oil and Gas Tax Breaks*

The energy sector provides another example of ecological damage that can occur due to government incentives. Over the past ten years, Congress has begun phasing out energy subsidies. For example, in 2011, legislators allowed the ethanol subsidy—which provided a "54-cent-per-gal tariff on imported ethanol and a 45-cent-per-gal tax credit to U.S. oil companies that purchased and blended ethanol with gasoline"—to expire.[184] In 2019 and 2021, the solar and wind subsidies, which provided partial government funding for infrastructure investments such as solar panels or wind turbines, wound down in the case of solar power and lapsed in the case of wind.[185] The IRA has extended solar investment tax credits until 2034 and extended the wind credits until 2024.[186] Based on these

[182] *See* Gerald J. Lauer et al., *Pesticide Contamination of Surface Waters by Sugar Cane Farming in Louisiana*, 95 TRANSACTIONS AM. FISHERIES SOC'Y 310, 310–16 (1966).

[183] *See* U.S. DEP'T OF COM., EMPLOYMENT CHANGES IN U.S. FOOD MANUFACTURING: THE IMPACT OF SUGAR PRICES 2 (2006).

[184] Jeff Johnson, *Ethanol Subsidies Expire*, AM. CHEM. SOC'Y: CHEM. & ENG'G NEWS (Jan. 4, 2012), https://cen.acs.org/articles/90/web/2012/01/Ethanol-Subsidies-Expire.html.

[185] *See* James Osborne, *Wind, Solar Face Future Without Subsidies*, HOUS. CHRON. (Dec. 26, 2019), https://www.houstonchronicle.com/business/energy/article/Wind-solar-face-future-without-subsidies-14930292.php; *Production Tax Credit and Investment Tax Credit for Wind Energy*, U.S. DEP'T OF ENERGY, https://windexchange.energy.gov/projects/tax-credits#:~:text=The%20Production%20Tax%20Credit%20(PTC,facility%20is%20placed%20into%20service. (last visited Apr. 3, 2023).

[186] *See Solar Investment Tax Credit: What Changed?*, U.S. DEP'T ENERGY: OFF. ENERGY EFFICIENCY & RENEWABLE ENERGY (Sept. 8, 2022),

actions, the federal government looks to be scaling down its involvement in promoting these renewable energy products. By contrast, there looks to be no end in sight to the large federal incentives for crude oil and other members of the petroleum family.

Incentives for the drilling of crude oil are indirectly applied but still make a significant impact on the production and profitability of drilling. These favorable conditions are not direct payments like many subsidies, so the incentives given to these companies are harder to estimate. However, the absolute value of these incentives ranges from $11.5 to over $20 billion per year, depending on which tax stipulations are counted.[187] Over fifty percent of these incentives come in the form of tax breaks that allow oil companies to claim costs against their incomes (often used for well-related operations, such as the income from wells or the exploration or development of new resources).[188] By not collecting as many taxes as it can by providing this cost deductible, the government is implicitly subsidizing the oil industry. Because of the wide variety of tax deductibles and regulatory costs, untangling exactly how much an oil company saves financially is much harder than calculating the reduction in an excise tax. Overall, however, the tax deductibles and myriad other industry-friendly regulations encourage the drilling of significant amounts of oil, so much so that the entities in the United States produce nearly a tenth of the world's production.[189] Due to the environmental costs of oil drilling, including both the physical toll it

https://www.energy.gov/eere/solar/articles/solar-investment-tax-credit-what-changed; *Production Tax Credit and Investment Tax Credit for Wind Energy*, *supra* note 185.

187 *See What Tax Incentives Encourage Energy Production from Fossil Fuels?*, TAX POL'Y CTR., https://www.taxpolicycenter.org/briefing-book/what-tax-incentives-encourage-energy-production-fossil-fuels (last visited Apr. 19, 2023); Clayton Coleman & Emma Dietz, *Fossil Fuel Subsidies: A Closer Look at Tax Breaks and Societal Costs*, ENV'T & ENERGY STUDY INST. (July 29, 2019), https://www.eesi.org/papers/view/fact-sheet-fossil-fuel-subsidies-a-closer-look-at-tax-breaks-and-societal-costs.

188 *See What Tax Incentives Encourage Energy Production from Fossil Fuels?*, *supra* note 187.

189 *See Oil Production Worldwide in 2010 and 2021, by Select Country*, STATISTA, https://www.statista.com/statistics/273504/oil-production-in-selected-countries-since-2000/ (last visited Apr. 19, 2023); *World Oil Supply and Demand, 1971–2020,* INT'L ENERGY AGENCY, https://www.iea.org/data-and-statistics/charts/world-oil-supply-and-demand-1971-2020 (last updated July 29, 2021).

takes on the local environment as well as its global contribution to GHG emissions, accounting for the myriad of tax breaks given to oil producers would be an effective step in reducing carbon emissions.

The natural gas industry, which describes many types of captured gas usually consisting of methane and other smaller chemicals,[190] does not enjoy as many incentives as oil but nevertheless benefits from favorable tax laws and ways to increase capital investment.[191] The relatively newfound viability of hydraulic fracturing, or "fracking," has led to a natural gas "mining boom" in the United States.[192] Hydraulic fracturing has nearly doubled the production of natural gas since 2005.[193] The United States is the top producer of natural gas, generating over five times more natural gas than every country except Russia, Iran, and China.[194] As with subsidies to oil companies, there seems to be a reluctance among federal lawmakers to give direct monetary stimulus to the natural gas industry. Some of this reluctance may be political optics: this year Ohio signed a bill defining natural gas as a source of "Green Energy," trying to rebrand it at a cleaner energy source than oil and coal even though

[190] *See Natural Gas Explained*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/natural-gas/ (last updated Dec. 27, 2022).

[191] *See Natural Gas Laws and Incentives in Federal*, U.S. DEP'T OF ENERGY, https://afdc.energy.gov/fuels/laws/NG?state=US (last visited July 3, 2023) (describing the "federal laws and incentives relating to natural gas").

[192] *See* THIEMO FETZER, FRACKING GROWTH 2 (2014) (stating that "the most important contributing factor is the development of unconventional resource extraction technology known as hydraulic fracturing or 'fracking' that has led to a mining boom across the US"). For an example of how natural gas has helped the United States reach goals of energy independence, see Paul Takahashi, *How Rebounding Oil Is Making U.S. Shale More Viable: QuickTake*, BLOOMBERG (Feb. 19, 2022), https://www.bloomberg.com/news/articles/2022-02-19/how-rebounding-oil-is-making-u-s-shale-more-viable-quicktake#xj4y7vzkg.

[193] *See U.S. Natural Gas Gross Withdrawals*, U.S. ENERGY INFO. ADMIN. (June 30, 2023), https://www.eia.gov/dnav/ng/hist/n9010us2A.htm (comparing the amount of natural gas withdrawn in 2005 and 2021).

[194] *See Natural Gas Production Worldwide in 2022, by Country*, STATISTA, https://www.statista.com/statistics/264101/world-natural-gas-production-by-country/ (last visited Apr. 19, 2023) (showing that the United States produced over 978.6 billion cubic meters of natural gas in 2022).

it emits "significant amounts of greenhouse gasses."[195] As production of natural gas booms, the federal government may believe that more subsidies are in order, and they have a variety of ways to encourage the resource extraction of fuels such as natural gas.

The primary way that the government stimulates natural gas production is through restrictions on taxes. The government provides two different incentive systems: one for the product itself and another for the producers of the product. Excise taxes are collected on natural gas at a rate that is favorable to the producers of the resource.[196] Also important to producers and landowners leasing out their mineral rights is the government's willingness to let resource-related expenses, such as cost depletion in limited circumstances, be deducted on personal taxes.[197] The Tax Reform Act of 1986 usually prevents people from using active business income to compensate for losses in passive activity. However, oil and natural gas wells were excluded from this definition, even if supervision of a well appears remarkably close to what would otherwise qualify as "passive income."[198] This means that if an oil well has tax deductions or losses that lead to the taxes being "negative," these losses can be deducted from what would be owed on a taxpayer's other taxes from a sale of stock or salary.[199] This tax deduction allows for the risk of oil drilling to be significantly reduced for its investors; if a project is unsuccessful, it simply becomes a tax write-off for its investors who likely have other less risky assets in their portfolio. If a project is successful, the well will make taxation a non-issue.

---

[195] Maxine Joselow, *How Dark Money Groups Led Ohio to Redefine Gas as Green Energy*, WASH. POST (Jan. 17, 2023), https://www.washingtonpost.com/politics/2023/01/17/how-dark-money-groups-led-ohio-redefine-gas-green-energy/.

[196] *See Natural Gas Laws and Incentives in Federal*, *supra* note 191 (see area under "Alternative Fuel Excise Tax Credit"); *New Federal Law Addresses Excise Tax on LNG, LPG, and CNG*, DELOITTE (Aug. 13, 2015), https://www2.deloitte.com/us/en/pages/tax/articles/multistate-tax-alert-new-federal-law-addresses-excise-tax-on-lng-lpg-cng.html (describing the decreases in taxes under the Obama Administration of types of natural gas).

[197] *See* Michael Jacobson, *Tax Treatment of Natural Gas*, PENN STATE EXTENSION (Nov. 7, 2013), https://extension.psu.edu/tax-treatment-of-natural-gas.

[198] *See* 26 U.S.C. § 469(c).

[199] *See id.*

This tax write-off is another version of an incentive system because it may encourage certain activities—in this context, the drilling and production of shale oil and liquefied natural gas—which has allowed the United States to increase its energy production dramatically since 2005 and become "energy independent" for the first time since the 1940s.[200] Before deciding to commission a drilling project, many drillers will do cost-benefit analysis. Three primary factors help a company decide whether to drill: the probability (P) of a "good" result (i.e., a well which produces oil at a cost lower than it costs to extract and sell that material) or a "bad" result, the magnitude (M) of the result (i.e., the amount of oil or gas produced and its profitability for the firm), and the costs (C) (including carrying costs such as taxes and maintenance) of the project.[201] If $P_{good}M + P_{bad}M > C$, the company will likely decide that drilling is a smart business choice.[202] The government cannot influence the P value because it does not have control of whether an individual spot will produce an economically viable amount of oil or gas. To influence

[200] *See* Robert Rapier, *U.S. Energy Independence Soars to Highest Level in Over 70 Years,* FORBES (May 2, 2023) https://www.forbes.com/sites/rrapier/2023/05/02/us-energy-independence-soars-to-highest-levels-in-over-70-years/?sh=6ea1b24b977f ("It ha[s] been a steady march [toward energy independence] since 2005, when U.S. Energy Imports hit a record high . . . . [I]n 2019 the U.S. produced more energy than we consumed since at least the 1940's . . . . [T]he reason was the shale boom that had begun in earnest in 2005."). Natural gas has been an important facet of how the United States has switched from being a net energy importer to exporter in the last 20 years. *See* David Brown, *Natural Gas Explained: Liquefied Natural Gas*, U.S. ENERGY ADMIN. (May 19, 2022), https://www.eia.gov/energyexplained/natural-gas/liquefied-natural-gas.php (showing the massive increase in exports of cubic feet of LNG starting in 2015, increasing from 28 billion to 3.6 trillion in only 5 years).

[201] Cost benefit analysis is used frequently by both oil producers and those that oversee them in local government and non-governmental organizations. This is a net revenue impact, which is calculated similarly. For an example of a cost-benefit analysis, see CITIZENS FOR A HEALTHY CMTY, ECONOMIC IMPACT OF NATURAL GAS DEVELOPMENT ON DELTA COUNTY (2018), https://www.chc4you.org/wp-content/uploads/2018/01/2018_CHC_EconomicImpactOfNaturalGasDev_V2.pdf.

[202] As an example, if a well is projected to produce either 10,000 barrels of oil per day if successful and only 1,000 barrels per day if it is unsuccessful, with each outcome being equally likely, the expected value of the project would be [(10,000) (.5)] + [(1,000) + (.5)], or 5,500 barrels. Unless the cost of drilling and maintaining the well is under 5,500 barrels times the market price, the project will never be commissioned.

drilling, the government must then either increase the amount gained in the event of a "good" outcome or decrease the loss to the drillers in a "bad" outcome. A tax write-off addresses the latter possibility because allowing a tax deduction in the case of a failed well reduces the extent of the overall loss.[203] Therefore, wells that were once just on the wrong sides of the margins because of a risky probability of success may be drilled because the calculus shifted with the tax deductions. Consequently, the government's insulation of financial hardships for well-diggers has made riskier projects more attractive and expanded the petroleum industry in the process.

Another important energy resource is natural gas. Natural gas is usually harvested through drilling in the ground, including hydraulic fracturing.[204] Because these deposits cannot be replenished easily, they are essentially a finite resource like oil.[205] However, biogas and biomethane are another type of gas commonly (if erroneously) put under the natural gas umbrella.[206] Biomethane is produced naturally by bacteria as they break down biomass (plant and animal materials); this differs from the formation of natural gas,

[203] This is an economic incentive because the cost of "failed" wells still provides a benefit to firms. This happens because the tax write-offs they receive lessens their overall costs in managing other, more successful wells. While not as impactful for smaller companies, when a firm has many drilling projects it would reduce their overall tax liability because losses on oil and gas exploration are allowed to reduce taxable income on their other business income. *See* 26 U.S.C. § 469(c)(3); *It's Time to Phase Out 9 Unnecessary Oil and Gas Tax Breaks*, CTR. FOR AMERICAN PROGRESS (May 26, 2016), https://www.americanprogress.org/article/it-is-time-to-phase-out-9-unnecessary-oil-and-gas-tax-breaks/.

[204] *See Natural Gas Explained*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/natural-gas/ (last updated Dec. 27, 2022).

[205] *See* Gioietta Kuo, *When Fossil Fuels Run Out, What Then?*, MILLENNIUM ALL. FOR HUMAN. AND THE BIOSPHERE, STANFORD UNIV. (May 23, 2019), https://mahb.stanford.edu/library-item/fossil-fuels-run/ (stating that "we have about 52.8 years' worth of natural gas reserves left").

[206] *See An Introduction to Biogas and Biomethane*, INT'L ENERGY AGENCY, https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/an-introduction-to-biogas-and-biomethane (last visited Apr. 19, 2023). While biogas comes from a different production system, it is sometimes put under the "natural gas" umbrella for convenience. *See, e.g.*, EPA, AN OVERVIEW OF RENEWABLE NATURAL GAS FROM BIOGAS 1 (July 2020), https://www.epa.gov/sites/default/files/2020-07/documents/lmop_rng_document.pdf.

which is created through geological processes.[207] After impurities such as carbon dioxide are removed, the biogas can be used as a cooking or heating gas and eventually allows for further emission reductions through refinement into biomethane.[208] Biomass is usually considered a renewable resource because the plant and animal material inputs are reproduceable and, at least theoretically, infinite in quantity. Therefore, depending on the "gas" being extracted, natural gas can be either a renewable or non-renewable source of energy.

Regardless of the character of these sources, they may benefit from complementary incentive systems. Additionally, some countries such as Brazil have already begun to create incentives for renewable energies like biomethane similar to those created for ethanol, solar, and wind power.[209] The federal government should encourage less ecologically harmful materials, such as biomethane, through similar incentives, while excluding more harmful alternatives from these cost-reducing programs.

CONCLUSION

Environmental regulations are a helpful vehicle for understanding how federal agencies use different mechanisms to regulate due to the constant movement in the policy space. The goals of a presidential administration may differ greatly from those of its predecessors and successors. Throughout the twentieth and twenty-first centuries, the modes of regulations used by EPA have changed according to different governing philosophies. The shift from mandatory oversight to deregulation, and finally to incentive-based schemes reflects a governmental approach that wishes to both regulate and delegate its environmental duties. These innovations in policy allowed for new applications to be given to 1960s and 1970s statutes—such as the cap-and-trade emissions systems aforementioned—without needing to go through the onerous political process of passing a separate bill.

---

207 *See* EPA, *supra* note 206, at 1.

208 *See id.*

209 *See* Marieta Cazarré, *Brazil Unveils Incentives to Biomethane Production*, AGÊNCIA BRASIL (Mar. 21, 2022), https://agenciabrasil.ebc.com.br/en/economia/noticia/2022-03/government-launches-measures-encourage-biomethane-production.

The final innovation of this delegation-based program is that of indirect, positive incentives—tax deductions for business losses. These regulations are even more indirect than supply allotments and protectionist tariffs. In comparison to typical positive subsidies, such as a percentage credit paid by the federal government, these rules allow for less interference with market forces. Congress continues to use them to generate profound effects in the fossil fuel industry, such as expanding a tax credit which encouraged carbon capture in industrial oil extraction sources, while their competitors in alternative energy have lost favor among government programs over the last decade.[210] However, the fragility of these programs due to the lack of a regulatory or public-safety requirement means that the industries supporting them must continue to convince elected officials that they are favorable to the public. These lobbying expenses have increased faster than inflation and provide a final check on lobbying structures. If a structure costs more to maintain through lobbying and countering public pressure than it produces through tax breaks and favorable treatment, companies may allow it to lapse so long as it is not replaced with more stringent regulations.

Overall, incentive-based regulations are the fusion of market-based reforms and performance standards of the 1980s and 1990s, with additional flexibility to combat the "information gap" that can lead to underenforcement of potential regulations. Unlike in other administrative systems, the act of setting a standard becomes less impactful than the creation of a structure which encourages compliance and minimizes administrative cost.[211] Incentive-based systems thereby work in tandem with existing regulations to increase the amount of reduction by rational actors over what a standard requires. By combining incentive-based regulations with command-and-control regulations or performance-based standards, pollution controls and other environmental goals can become more effective by fully capturing the social surplus and creating an adaptive system.

---

[210] *See* Katherine Breaks et al., *Drilling Down—Examining the Section 45Q Tax Credit*, KPMG (Mar. 5, 2020), https://kpmg.com/us/en/home/insights/2020/03/examining-section-45q-tax-credit.html (examining the 2018 expansion of a 2008 Tax Credit for the reduction of CO_2 emissions captured during enhanced oil recovery to include carbon oxide as well).

[211] *See* Farber, *supra* note 6, at 297–98, 301–02.

However, more combined regulation may require Congressional action. There is no specific mention of incentives in either the Clean Air Act or Clean Water Act, and ultimately many of the "programs" that EPA could create may run afoul of a Supreme Court bench that heavily scrutinizes delegation. The bipartisan tactic of bypassing congressional action by retrofitting old environmental regulations to new political realities may soon be at an end. Without a bill clarifying the powers EPA has to enforce its founding statutes, a judicial "veto" seems likely. Federal administrative structures face an increasingly uncertain path forward, especially in environmental law. Arguments about delegation and the Major Questions Doctrine have hoisted agency-created plans, including permit systems, to the scrutinizing eyes of the Supreme Court.[212] With *West Virginia v. EPA*, the Court has made clear its preference for traditional "direct" interpretations of congressional statutes and it remains to be seen whether incentive-based programs will survive judicial scrutiny.

[212] For example, in a 6–3 ruling authored by Chief Justice Roberts, the Supreme Court disagreed with the EPA's assertions of regulatory power under Section 111(d), stating that its arguments were based off "vague language of an 'ancillary provision' of the Act" and that its interpretation would be a "transformative expansion in [its] regulatory authority." *See* West Virginia v. EPA, 142 S. Ct. 2587, 2610 ("Under our precedents, this is a major questions case."). What these limitations have in store for the EPA's latest programs is unknown, and future cases will likely take up the mantle of defining the EPA's permissive regulatory reach.