BEAUTY IN DESOLATION:[†] ADDRESSING AMERICA'S WASTE CRISIS THROUGH TAX REFORM

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ABSTRACT

Contaminated waste sites proliferate across the United States. However, current cleanup incentives fail to induce necessary private sector engagement. Environmental taxation can be a crucial instrument for addressing this issue. This Note begins by exploring why neither the free market, nor regulation is well-suited to manage contamination cleanups on abandoned properties. The Note then proposes a two-phase tax reform for addressing hazardous waste. First, Congress should expand the incentives available to developers to perform the necessary cleanups. Second, an effluent tax should be implemented on large quantity hazardous waste producers to promote the polluter-pays principle and to enhance the efficiency of waste management. This second phase should be introduced in conjunction with the phasing out of detrimental expenditures that distort market forces in favor of polluting behaviors.

INTRODUCTION

In a recent Gallup poll, a majority of Americans surveyed expressed concern about the quality of their drinking water.[1] Given recent ecological disasters, these concerns are justified. In 2017, DuPont and Chemours Co. settled around 3,550 personal injury cases for $671 million after the company dumped toxic sludge into "digestion ponds," which contaminated the water supply of more than 100,000 people.[2] Cabot Oil and Gas agreed to cover the water bills of Pennsylvania communities for seventy-five years after the

[†] JEFF VANDERMEER, ANNIHILATION 6 (2014) ("[W]hen you see beauty in desolation it changes something inside you.").

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[1] *Environment*, GALLUP: NEWS (last visited 2022), https://news.gallup.com/poll/1615/environment.aspx [https://perma.cc/45YK-C723] (noting that 57% of respondents surveyed worried a great deal about drinking water pollution).

[2] Arathy S. Nair, *DuPont Settles Lawsuits Over Leak of Chemical Used to Make Teflon*, REUTERS: ENV'T (Feb. 13, 2017, 3:49 AM), https://www.reuters.com/article/us-du-pont-lawsuit-west-virginia/dupont-settles-lawsuits-over-leak-of-chemical-used-to-make-teflon-idUSKBN15S18U [https://perma.cc/Z2D5-RNFN]; Nathaniel Rich, *The Lawyer Who Became Dupont's Worst Nightmare*, N.Y. TIMES MAGAZINE (Jan. 6, 2016), https://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html [https://perma.cc/SXM3-JYUR].

company pled guilty to illegally discharging fracking waste that poisoned the local water supply.[3]

Environmental regulation has substantially improved hazardous waste management in the United States over the past forty years. However, as the previous examples show, contamination persists in the United States; as of February 2021, only 25% of hazardous waste sites on the Environmental Protection Agency's ("EPA") National Priority List had been restored.[4] This Note argues that regulation alone cannot resolve the current pollution crisis because it cannot adequately incentivize the private sector to (1) undertake environmental repairs or (2) shift production to less hazardous methods. This Note proposes expanding tax expenditures for developers undertaking environmental remediation projects. The Note further advocates for an effluent tax on all hazardous waste production and the removal of tax expenditures for polluting behaviors.

The remainder of this Note proceeds in five parts. Part I examines the hazardous waste crisis in the United States through an environmental justice lens. Part II considers existing environmental regulations by the federal government and individual states. Both strict liability measures and command-and-control regulations have led to substantial improvements in hazardous waste management. However, these types of laws cannot address the sheer number of waste sites in need of repair. This Part also compares the economic effects of regulation with environmental taxation before concluding that the Internal Revenue Code ("I.R.C." or "Tax Code") is better suited to handle today's crisis. Part III briefly explains the relevant Tax Code sections and concepts for environmental remediation. It examines the historical treatment of cleanup costs by the Internal Revenue Service ("IRS"), I.R.C. § 198 ("Section 198"), and the federal courts. Part IV outlines that Congress can reduce the number of hazardous waste site across the nation by offering site assessment credits, allowing developers to deduct remediation expenses, and expanding tax expenditures for research and development.

Finally, Part V advances an effluent tax proposal on hazardous waste producers. This Note argues that this tax will shift the cost of pollution to the responsible parties and lead to technological innovation. Environmental taxes aim to force the polluter to internalize the cost of their waste at the lowest cost possible. A key premise from a critic's point of view is that an efficient environmental tax is one that induces the development of sustainable technology or practices without otherwise altering the behavior of taxpayers. A corresponding cut in tax expenditures for fossil fuel production must accompany the effluent tax. Such deductions and credits reward polluters while preventing market equilibrium.

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[3] Susan Phillips, *'Gasland' Driller will Pay Millions for New Water System in Dimock*, NPR: STATE IMPACT PA. (Dec. 13, 2022, 4:36 PM), https://stateimpact.npr.org/pennsylvania/2022/11/29/gasland-driller-pleads-guilty-will-pay-millions-for-new-water-system-in-dimock [https://perma.cc/FQF7-53EU].

[4] Robin Kundis Craig, *The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*, *in* ENV'T LAW IN CONTEXT: CASES & MATERIALS 233, 381 (2022) ("As of February 2021, 1,765 sites had made the NPL at some point, with 48 more proposed but 438 cleaned up and removed.").

I. POLLUTION, REGULATION, AND THE TAX CODE

A. CHEMICAL CONTAMINATION IN THE UNITED STATES: WHY THE FREE MARKET CANNOT RESOLVE ENVIRONMENTAL CLEANUPS

In 2010, the United Nations General Assembly passed Resolution 64/292 "recognizing that safe and clean drinking water is a human right and is essential to realizing all human rights."[5] Yet, in the United States, many communities lack clean drinking water because of toxic contaminant exposure.[6] Volatile organic carbons ("VOCs"), including solvents, refrigerants, gasoline hydrocarbons, and fumigants, are present in 26% of public wells and 14% of domestic wells.[7] Many of these VOCs come from hazardous waste sites.[8] VOCs are potentially carcinogenic and affect the major organs of the body.[9] Between 2006 and 2013, nearly 10% of hydraulic fracturing spills contaminated municipal drinking water.[10] Derivative wastewater tests across hundreds of California fracking sites revealed the carcinogenic VOC benzene on average at levels seven-hundred times the allowable federal standard.[11]

Chemical contamination affects not only our water supply but also the soil beneath our homes and the food we consume.[12] Persistent, bioaccumulative, and toxic chemicals ("PBTs") "break down very slowly in the environment and tend to build up in [the tissue of] organisms throughout

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[5] *Guidance on PFAS Exposure, Testing, and Clinical Follow-Up*, NATI'L ACADS. OF SCIS., ENG'G & MED. (2022), https://doi.org/10.17226/26156 [https://perma.cc/FC2W-7232]; *see also* Ann. Rep. of the United Nations High Comm'r for Human Rights and Rep's. of the Office of the United Nations High Comm'r for Human Rights and the Sec'y-Gen., U.N. Doc. A/HRC/6/3, at 12 (2007).

The WHO Guidelines for Drinking-water Quality (the WHO Guidelines) constitute an international reference point for drinking water quality regulation and standard setting. They define safe drinking water as water that does not represent any significant risk to health over a lifetime of consumption and that is free of microbial pathogens, chemical and radiological substances. These requirements apply to all sources of water provision.

[6] J. Tom Mueller & Stephen Gasteyer, *The Widespread and Unjust Drinking Water and Clean Water Crisis in the United States*, 12 NATURE COMMC'NS 1 (June 22, 2021), https://doi.org/10.1038/s41467-021-23898-z [https://perma.cc/M8F3-9G7W] (examining the extent of the water crisis in the United States).

[7] NAT'L RES. COUNCIL, ALTERNATIVES FOR MANAGING THE NATION'S COMPLEX CONTAMINATED GROUNDWATER SITES, 57 (2013).

[8] *Id*.

[9] John S. Zogorski, Janet M. Carter, Tamara Ivahnenko, Wayne W. Lapham, Michael J. Moran, Barbara L. Rowe, Paul J. Squillace & Patricia L. Toccalino, *The Quality of Our Nation's Waters: Volatile Organic Compounds in the Nation's Ground Water and Drinking-Water Supply Wells*, U.S. GEOLOGICAL SURV. (2006), https://pubs.usgs.gov/circ/circ1292/pdf/circular1292.pdf [https://perma.cc/GAD3-XPLZ].

[10] Hydraulic Fracturing is a process used to enhance oil and gas extraction. In 2015, it accounted for roughly 50% of oil and 70% of gas production. At least 173 chemicals used in the hydraulic lifecycle are toxic to humans. *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States*, EPA (Dec. 2016), https://www.epa.gov/hfstudy [https://perma.cc/C567-46NH].

[11] Julie Cart, *High Levels of Benzene Found in Fracking Waste Water*, L.A. TIMES (Feb. 11, 2015), https://www.latimes.com/local/california/la-me-fracking-20150211-story.html [https://perma.cc/HY8K-GTCY].

[12] This Note focuses primarily on the relationship between waste, clean water, and human health. However, waste also has a profound impact on climate change. Municipal solid waste landfills are the third-largest source of methane emissions. *See Basic Information about Landfill Gas*, EPA (last updated Aug. 3, 2023), https://www.epa.gov/lmop/basic-information-about-landfill-gas [https://perma.cc/D9K8-8J82].

the food web."[13] The consumption of such chemicals is linked to lowered IQ, anemia, cancer, and an increased risk of miscarriage.[14]

"Brownfields" are properties where "expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."[15] In the 1990s, the EPA initiated a brownfield redevelopment program to "prevent, assess, safely clean up, and sustainably reuse [brownfield properties]."[16] Regarding brownfields, the EPA is authorized to provide incentives to the public and private sectors "to promote sustainable brownfields cleanup and reuse."[17] An estimated 450,000 to one million brownfield sites are believed to exist in the United States.[18] As of March 2022, the brownfield program had revitalized 0.002%–0.005% of brownfields.[19] The National Research Council estimates that the cost of repairing current hazardous waste sites is $110–127 billion.[20] This does not include the cost of remediation for unknown toxic chemicals or undiscovered contamination.

The proliferation of brownfields and other hazardous waste sites raises environmental justice concerns because the externalities from such sites are borne primarily by America's most marginalized citizens.[21] A study by the Guardian found that clean drinking access in the United States is highly unequal across economic and racial lines.[22] Among identified brownfields, 66% are in communities with median household incomes below the state average, and 53% have above average unemployment.[23] Unsurprisingly, community property values fall around a contaminated site.[24] The

[13] EPA, CHEMICAL PROFILES (Mar. 2022), https://www.epa.gov/trinationalanalysis/chemical-profiles [https://perma.cc/JNR2-6MWA]; *see generally* EPA, TOXICS IN THE FOOD WEB (last updated Oct. 27, 2023), https://www.epa.gov/salish-sea/toxics-food-web [https://perma.cc/3NGE-YLZT]; EPA, AMERICA'S CHILDREN AND THE ENVIRONMENT (last updated Sept. 29, 2023), https://www.epa.gov/americaschildrenenvironment [https://perma.cc/2T2L-3PFX].

[14] Nat'l Acads. of Scis., Eng'g & Med., Environmental Neuroscience: Advancing the Understanding of How Chemical Exposures Impact Brain Health and Disease: Proceedings of a Workshop 13, 25 (2020); *see also Learn about Lead*, EPA, https://www.epa.gov/lead/learn-about-lead [https://perma.cc/3NGE-YLZT] (last visited Dec. 15, 2022).

[15] Brownfields Revitalization and Environmental Restoration Act of 2001, Pub. L. No. 107-118, § 9601(39)(A), 115 Stat. 2361.

[16] JAMES. T. O'REILLY, SUPERFUND & BROWNFIELDS CLEANUP 1 (2022); Brownfields, No. 107-118, § 9601, 115 Stat. 2356.

[17] EPA, OVERVIEW OF EPA'S BROWNFIELD PROGRAM (Jan. 2023), https://www.epa.gov/brownfields/overview-epas-brownfields-program [https://perma.cc/2YAH-ZU8Q].

[18] U.S. GOV'T ACCOUNTABILITY OFF., GAO-05-94, BROWNFIELD REDEVELOPMENT: STAKEHOLDERS REPORT THAT EPA'S PROGRAM HELPS TO REDEVELOP SITES, BUT ADDITIONAL MEASURES COULD COMPLEMENT AGENCY EFFORTS 1 (2004).

[19] Percentages calculated based on the GAO estimates and rounded to the nearest thousandth. *See* EPA, BROWNFIELD AND LAND REVITALIZATION PROGRAM IMPACTS (2022), https://www.epa.gov/system/files/documents/2021-10/oct2021-brownfields-and-land-revitalization-program-impacts_final.pdf [https://perma.cc/R2XG-BDYZ] (explaining that through the Brownfield program 25,162 properties had been assessed, and 2323 properties were cleaned up).

[20] NAT'L RSCH. COUNCIL, ALTERNATIVES FOR MANAGING THE NATION'S COMPLEX CONTAMINATED GROUNDWATER SITES 68–69 (2013).

[21] Klara Zwickl, Michael Ash & James K. Boyce, *Regional Variation in Environmental Inequality: Industrial Air Toxics Exposure in U.S. Cities*, 107 ECOLOGICAL ECON. 494 (2014); *see also* Executive Order 12898, 32 C.F.R. § 651.17 (2023).

[22] Ryan Felton, Lisa Gill & Lewis Kendall, *We Sampled Tap Water Across the U.S. – and Found Arsenic, Lead and Toxic Chemicals*, THE GUARDIAN (Mar. 31, 2021), https://www.theguardian.com/us-news/2021/mar/31/americas-tap-water-samples-forever-chemicals [https://perma.cc/8JSN-SL59].

[23] CRAIG L. JOHNSON & KENNETH A. KRIZ, TAX INCREMENT FINANCING AND ECONOMIC DEVELOPMENT 203 (2nd. ed. 2019).

[24] *See generally* Marie Howland, *Employment Effects of Brownfield Redevelopment: What Do We Know from the Literature?* 1–47 (Nat'l Ctr. for Env't Econ., Working Paper No. 07-01, 2007); Sangyun

devaluation of these properties correlated with a rise in poverty and crime rates and a decline in both school quality and community infrastructure.[25]

Local and state governments are faced with a difficult trade-off in deciding how to manage hazardous waste sites. The cost of cleaning or monitoring abandoned properties depletes municipal resources because local governments must fund many projects with taxpayer dollars.[26] Yet, postponing cleanups exacerbates a community's problems. Evidence suggests that "when cleanup is delayed for ten, fifteen, and even up to twenty years, the discounted present value of the cleanup is mostly lost, most likely because sites are stigmatized and the homes in the surrounding communities are shunned."[27]

Brownfield proliferation also intensifies a growing affordable housing crisis because locations where affordable housing could be built remain unused because of contamination. Most brownfields are located in or around "central city neighborhoods."[28] Local and state governments must attract development to alleviate the affordable housing crisis—a particularly arduous task for cash-strapped local governments whose tax bases have eroded due to environmental degradation.

Though the collective benefits of environmental repair are substantial, uncertainty over the rate of return remains a significant deterrent to private investment.[29] While property values improve post-cleanup, prices tend to recover slowly because of the pollution's stigma.[30] Currently, brownfield funding tends to only occur in the most marketable locations where pricing is less uncertain.[31] This disparate treatment of different socioeconomic communities exacerbates environmental justice issues. The government must intervene to alleviate this inequality because "[w]hen [markets fail, or] there are additional social interests or third-party interests to be taken into account, [and] it is the role of governments to find cost-effective means of introducing these considerations into the private sector decision-making process."[32]

Lee & Paul Mohai, *Racial and Socioeconomic Assessments of Neighborhoods Adjacent to Small-Scale Brownfield Sites in the Detroit Region*, 13 ENV'TL. PRAC. 340 (2011).

[25] Howland, *supra* note 24, at 15.

[26] NAT'L VACANT PROPS. CAMPAIGN, VACANT PROPERTIES: THE TRUE COSTS TO COMMUNITIES 6 (2005).

[27] Trudy Cameron, Graham Crawford, Katherine Hackett, Gary McClelland, Messer Kent & William Schulze, *Stigma: The Psychology and Economics of Superfund* 7 (Env. Econ. Rsch. Inventory Working Paper No. EE-0486, 2004).

[28] Linda McCarthy, *Off the Mark?*, 23 ECON. DEV. Q. 211, 213 (2009). The decade between 2008 and 2018 represented a sixty-year low in new home construction. The COVID-19 pandemic exacerbated this problem as material prices skyrocketed; *see* Jeffery Hayward, *U.S. Housing Shortage: Everything, Everywhere, All At Once*, FANNIE MAE: PERSPECTIVES BLOG (Oct. 31, 2022), https://www.fanniemae.com/research-and-insights/perspectives/us-housing-shortage [https://perma.cc/C3V9-8KQ8].

[29] JOHNSON & KRIZ, *supra* note 23, at 199.

[30] *Id.*

[31] *Id*. (arguing that current funding practices have led to clean to only development in the most marketable locations where pricing is less uncertain).

[32] McCarthy, *supra* note 28, at 214 (citing Dan Hara, Market Failures and the Optimal Use of Brownfield Redevelopment Policy Instruments (Jan. 14, 2003) (paper presented at the Canadian Economics Association annual meeting, Ottawa, Ontario, Canada)).

II. ENVIRONMENTAL REGULATION: WHY CURRENT FEDERAL REGULATION CANNOT INDUCE PRIVATE SECTOR ENGAGEMENT

Today, United States environmental policy relies primarily on a blend of "command-and-control" and strict liability measures. Throughout the late 1800s and early 1900s, a "tacit agreement" gave local governments and firms[33] the authority to monitor and implement waste management practices.[34] During this period, urban manufacturers dumped industrial waste into municipal waterways. This method received public support because of the perception that "wastes acted as bactericides that cleansed local waters of putrefying organic wastes from stockyards, slaughterhouses, and sewers."[35] By the 1950s, increases in "volume, diversity, and toxicity" led to widespread pollution concerns.[36] Federal regulators increased their oversight of production and waste disposal practices.[37] In response, firms began dumping waste onsite, which diminished legal liabilities under the existing regulatory regime.[38] Between 1950 and 1979, chemical manufacturers disposed of 94% of waste into the land.[39]

A. STRICT LIABILITY

In 1978, residents of Niagara Falls learned that waste from the "Love Canal" toxic waste disposal had leached into their soil and water.[40] Congress responded in 1980 by passing the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA").[41] CERCLA *retroactively* created strict liability for potentially responsible parties ("PRPs").[42] Under CERCLA, the EPA may clean up the contamination and seek reimbursement from the liable party,[43] or it may obtain a consent decree and oversee a cleanup performed by the PRP.[44] The retroactive nature of CERCLA means that some "orphan sites" exist where no existing PRP can be identified.[45] To address this challenge, Congress created a "Superfund" to finance cleanups.[46] Initially, the Superfund was funded by excise taxes on petroleum, chemical feedstocks, and corporate income.[47] However, since 1995, Congress has allowed the tax to lapse.[48] By 2003, tax funding was exhausted,

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[33] *Firm*, BLACK'S LAW DICTIONARY (11th ed. 2019) (A firm is "the title under which one or more persons conduct business jointly.").

[34] James R. Elliott & Scott Frickel, *The Historical Nature of Cities: A Study of Urbanization and Hazardous Waste Accumulation*, 78 AM. SOCIO. REV. 521, 522 (2013).

[35] *Id.*

[36] *Id.*

[37] *Id.* at 523.

[38] *Id.*

[39] *Id.* ("Common methods for such onsite disposal include burying wastes in metal or fiber barrels, dumping them directly into open pits or lagoons, and injecting them into deep wells.").

[40] Alicia Saunté Phillips, Yung-Tse Hung & Paul A. Bosela, *Love Canal Tragedy*, 21 J. PERFORMANCE OF CONSTRUCTED FACILITIES 313, 313 (2007).

[41] Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-75.

[42] CAROLINE N. BROUN & JAMES T. O'REILLY, RCRA AND SUPERFUND: A PRACTICE GUIDE § 9:2 (3d. ed. 2023), Westlaw; *see also* 42 U.S.C. § 9607(a).

[43] 42 U.S.C. § 9604(a).

[44] *Id.* § 9606(a).

[45] Kundis Craig, *supra* note 4, at 380.

[46] 42 U.S.C. § 9507.

[47] BROUN & O'REILLY, *supra* note 42, at § 9:145.

[48] *Id.*

and the public bore the cleanup costs.[49] Recently, Congress authorized an amended Superfund tax to provide funding, signaling a new era for environmental taxation in the United States.[50]

The sheer extent of contamination nationwide requires regulators to focus on the most extreme cases at the expense of others.[51] "Lesser" sites are likely to be passed over for funding, leaving neighborhoods stagnated. There are at least 126,000 sites that have residual contamination at levels too low to warrant federal intervention.[52] Likewise, the government lacks the technology to address the most complex contamination cases.[53] Part of the challenge for the federal government is that it must manage the cleanup previously caused by its own institutions.[54] The Department of Defense is responsible for contamination on almost 26,000 sites, costing the government an estimated $12.8 billion.[55]

B. COMMAND-AND-CONTROL REGULATION

Command-and-control—or prescriptive—regulations are policy tools that dictate "how much pollution an individual source or plant is allowed to emit [and] what types of control equipment it must use to meet such requirements."[56] Congress uses prescriptive regulations such as the Clean Water Act ("CWA"), the Toxic Substance Control Act ("TSCA"), and the Resource Conservation and Recovery Act ("RCRA") [57] to manage ongoing practices to reduce pollution. These measures have succeeded in reducing the extent of environmental degradation. For instance, under RCRA, eighteen million acres have been restored for productive use, and municipal waste recycling ("MWR") increased from 7% to 35%.[58]

However, the existing laws have produced "massive confusion and frustration" with an underfunded and understaffed EPA struggling to "make the regulations match the strict delegations of specific authority that Congress imposed."[59] The TSCA mandated the EPA to "proactively assess chemical safety."[60] Yet, between 1979 and 2004, less than 10% of proposed chemicals received EPA review, and less than ten chemicals were actively regulated.[61] Chemicals were presumed safe "unless the EPA could provide substantial evidence of unreasonable risk to human or environmental health, or both."[62] In 2020, firms in the United States disposed of 28.33 billion

[49] *Id.*
[50] *Id.*
[51] NAT'L RSCH. COUNCIL, *supra* note 20, at 68–69.
[52] *Id*.
[53] *Id.*
[54] *Id.* at 14.
[55] *Id.*
[56] EPA, GUIDELINES FOR PREPARING ECONOMIC ANALYSIS 4-3 (2014).
[57] Resource Conservation and Recovery Act 42 U.S.C. §§ 6901–6992k.
[58] EPA, RCRA'S CRITICAL MISSION & THE PATH FORWARD, 5–6 (2014).
[59] BROUN & O'REILLY, *supra* note 42, § 2:1.
[60] Christopher D. Kassotis, Laura N. Vandenberg, Barbara A. Demeneix, Miquel Porta, Remy Slama & Leonardo Trasande, *Endocrine-Disrupting Chemicals: Economic, Regulatory, and Policy Implications*, 8 LANCET DIABETES & ENDOCRINOLOGY, 719, 721 (2020).
[61] *Id*.
[62] *Id*.

pounds of production-related chemicals.[63] Over three billion pounds of these chemicals were disposed into the land, air, or surface water.[64] Meanwhile, Americans spend over $60 million annually to avoid getting sick from contaminated water.[65]

This failure highlights how command-and-control regulation relies on *static* baseline standards and compliance metrics that fail to incentivize abatement below required levels.[66] Regulatory standards are unlikely to accomplish an "equalization of marginal pollution costs" across polluting firms: limited information and high transaction costs make it unlikely that regulators will accurately predict each polluter's *efficient* emission level.[67] Polluters, who could abate pollution further, lack the financial rationale to do so, and the public is left bearing the externalities. Baseline standards may even enable polluting firms to escape liability when pollution occurs within complying practices.[68]

Furthermore, preventative regulation requires "optimal standards and optimal enforcement," making it expensive to implement.[69] Bureaucrats must use substantial revenues on staff, legal proceedings, and investigations because they lack complete information about private actors' abatement costs and actions. Greater industry disclosure would alleviate these costs, but harsh regulations create disincentives for firms to share information.[70] Private interest theory indicates that firms may benefit by providing misleading data.[71]

Public choice economists argue that command-and-control regulation may actually benefit private and political interests rather than the public's interests.[72] Eric Helland and Mayumi Matsuno found that increased environmental regulation reduced market competitiveness and created more concentrated industries with a few high-wealth firms.[73] Greater concentration enables industries to spend more on lobbying.[74] Lobbying groups help the government set instruments to regulate externalities,

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[63] EPA, INTRODUCTION TO THE 2020 TRI NATIONAL ANALYSIS, 1–2 (2022), https://www.epa.gov/system/files/documents/2023-03/complete_2021_tri_national_analysis.pdf [https://perma.cc/FC82-Z34D].

[64] *Id*. at 2, 51 (describing RCRA design standards for landfills and surface impoundments as including a double liner, a leachate collection and removal system, and a leak detection system, which must also comply with RCRA inspection, monitoring, and release response requirements).

[65] Joshua Graff Zivin, Matthew Neidell & Wolfram Schlenker, *Water Quality Violations and Avoidance Behavior: Evidence from Bottled Water Consumption*, 101 AM. ECON. REV. 448, 452–53 (2011).

[66] BROUN & O'REILLY, *supra* note 42.

[67] *Id.*

[68] *Id.*

[69] Michael G. Faure & Stefan E. Weishaar, *The Role of Environmental Taxation: Economics & the Law*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION 399, 407 (Janet E. Milne & Mikael Skou Anderson eds., 2012).

[70] *Id.*

[71] *Id.*

[72] *Id.*

[73] Eric Helland & Mayumi Matsuno, *Pollution Abatement as a Barrier to Entry*, 24 J. REGUL. ECON. 243, 253 (2003).

[74] For example, in 2016, numerous firms in industries with high hazardous waste outputs were among the top 50 firms in lobbying expenditures. This list included Dow Chemical (13,635,982), Exxon Mobil ($11,840,000), Koch Industries ($9,840,000), American Chemistry Council ($9,020,000), and Chevron ($7,470,00). Megan R. Wilson, *Lobbying's Top 50: Who's Spending Big*, THE HILL (Feb. 7, 2017, 6:00 AM), https://thehill.com/business-a-lobbying/business-a-lobbying/318177-lobbyings-top-50-whos-spending-big [https://perma.cc/482S-RNQZ].

resulting in penalties for "unauthorized pollution" but no efforts to reduce effluence-causing production that falls within legal limits.[75] This penalizes the breakdowns, but not the fundamental cause of pollution. Additionally, Frank J. Dietz and Herman R. J. Vollebergh suggest that command-and-control regulation, when compared to market mechanisms, further enhance politicians' images as environmentally conscious.[76] However, these same actors demonstrate little interest in improving the cost efficiency of environmental policy and exhibit apathy toward actually accomplishing the environmental goals.[77]

C. THE ROLE OF STATES

States may take primary responsibility for regulating waste so long as their measures are at least compatible with federal standards.[78] However, like the federal government, the states are ill-equipped to handle cleanups—shrinking budgets and a backlog of sites lead states to shut down cleanup sites even before they are considered a low threat to the public.[79] Some states privatized aspects of the remediation process to meet timelines for site closure and unburden state and local agencies.[80]

State and local governments could finance these cleanups through environmental tax revenues, but the federal government is better positioned to introduce tax reforms for several reasons. First, improvements in technology and transportation make tax bases more mobile.[81] By raising environmental taxes on their own, states risk an exodus of industry. Second, modern corporate structures make administering state and local taxes more complicated.[82] Corporations with entities in different states can shift their tax liability toward states with more lax environmental standards, producing a "race to the bottom."[83]

Additionally, disposal often produces *local spillover effects*; waste both creates local pollution and permeates into surrounding jurisdictions.[84] Variation in waste tax rates correlates with interstate competition—states with high rates often have neighbors with low rates and vice versa.[85] This discrepancy in rates means that even if a state sets waste taxes sufficiently high, it might still have high remediation costs due to the actions of its

[75] Nils Axel Braathen, *The Political Economy of Environmental Taxation*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 230, 232.

[76] *Id.*

[77] Lobbying groups also play a considerable role in the choice of environmental policy. *Id.* at 234–35 ("[I]t is easier for small groups that would be hard-hit by a given policy to organize their opposition than it is for a large group of actors that would obtain a small, positive benefit from the policy to organize support for it.").

[78] Wesley Blundell, Mary F. Evans & Sarah L. Stafford, *Regulating Hazardous Wastes Under U.S. Environmental Federalism: The Role of State Resources*, J. ENV'T ECON. & MGMT., Apr. 26, 2021, at 13.

[79] *Id.* at 5.

[80] *Id.*

[81] Nathalie Chalifour, Maria Amparo Grau-Ruiz & Edoardo Traversa, *Multilevel Governance: The Implications of Legal Competencies to Collect, Administer and Regulate Environmental Tax Instruments*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 249, 253–61.

[82] *Id*.

[83] *Id*.

[84] *Id.* at 254.

[85] Robin Jenkins & Kelly Maguire, *State Hazardous and Solid Waste Taxes: Understanding their variability* 17 (Nat'l Center for Env't. Econ., Working Paper No. 09-01, 2009).

neighbors. As Nathalie Chalifour, María Amparo Grau-Ruiz, and Edoardo Traversa note, "where there is a real risk of jurisdictional competition for mobile capital, possibly leading to a 'race to the bottom' of environmental standards, centralized environmental taxes may be favorable."[86]

Tax Incremental Financing ("TIF") is perhaps the most effective way for states to induce development.[87] TIF involves a state or local government funding development with property taxes.[88] The assumption is that the remediation will increase community values and provide sufficient revenues to fund the project.[89] TIF should continue to be a tool harnessed by local governments. However, with TIF, communities bear the cost of externalities, which violates the "polluter-pays" principle, by which the cost to clean up waste or the amount by which pollution exceeds an acceptable level should be borne by those who cause it, not by the public at large.[90] TIF violates the polluter-pays principle because it takes tax dollars that could have been used for other municipal purposes. Neither polluters nor consumers are incentivized to avoid harmful behavior. Finally, numerous TIF projects enable speculative construction rather than addressing urban blight.[91] Cities used these funds to construct Whole Foods stores,[92] sports stadiums,[93] and tourist attractions.[94] For TIF to succeed, governments must impose strict mandates on the type of development the funds may be used for. If a federal effluent tax is levied, the government can earmark revenues to support TIF-funded districts with strict guidelines prohibiting the funds from being used for stadiums or tourist attractions.

III. TAX LAW: HOW UNCERTAINTY AND INCONSISTENCY UNDERMINED PAST EFFORTS

This section explores the historical relationship between environmental and tax policies. It begins with a brief overview of general tax policy followed by past treatments of cleanup costs. The Tax Code tries to match tax liability as closely as possible to the underlying economic realities of a transaction.

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[86] Chalifour et. al., *supra* note 81, at 256.

[87] *Tax-Increment Financing*, BLACK'S LAW DICTIONARY (11th ed. 2019) ("A technique used by a municipality to finance commercial developments usu. involving issuing bonds to finance land acquisition and other up-front costs, and then using the additional property taxes generated from the new development to service the debt."); *see also* JOHNSON & KRIZ, *supra* note 23 (explaining TIF in detail).

[88] *See* JOHNSON & KRIS, *supra* note 23, at 15.

> Once the [tax increment district] is established, these overlapping governmental units now find themselves sharing their property tax base with the TID. From a TIF perspective, these overlapping taxing districts are considered contributing jurisdictions, in the sense that they contribute a part of their future tax base to the TIF.

[89] *Id.*

[90] *Polluter-pays principle*, BLACK'S LAW DICTIONARY (11th ed. 2019).

[91] Scott Beyer, *The Perils and Promises of a Popular Yet Controversial Financing Method*, GOVERNING: THE FUTURE OF STATES AND LOCALITIES (2016), https://www.governing.com/archive/gov-tax-increment-financing.html [https://perma.cc/KMA8-BWAT].

[92] *Id.*

[93] Frederick Melo, *St. Paul Council Agrees to $900,000 in TIF for Soccer Stadium*, TWINCITIES (Jul. 19, 2017, 10:38 PM), https://www.twincities.com/2017/07/19/st-paul-council-agrees-to-900000-in-tif-for-soccer-stadium [https://perma.cc/CSV6-3HSL].

[94] Tanvi Misra, *The Trouble with TIF*, BLOOMBERG (Sept. 12, 2018, 2:52 PM) https://www.bloomberg.com/news/articles/2018-09-12/does-tax-increment-financing-really-work-usually-no [https://perma.cc/QZ6S-R87E].

A. DEDUCTIONS

Taxpayers can deduct ordinary and necessary expenses incurred from carrying out a trade or business during a taxable year.[95] Expenses are deductible *repairs* if they do not increase the useful life or value of the asset[96] or if they merely keep the asset in efficient operating condition.[97] Immediate deductions reduce the taxpayer's liability in the year incurred. Delaying tax liability allows the taxpayer to use that money for other purposes in the intervening period. The tax law views tax deductions as a "matter of legislative grace and that the burden of clearly showing the right to the claimed deduction is on the taxpayer."[98]

B. CAPITAL EXPENDITURES

Capital expenditures, such as "any amount paid out for new building or permanent improvements or betterments," or any amount paid in restoring property in in making good the exhaustion thereof for which an allowance is or has been made are not deductible.[99] Such expenses are *improvements* if made "(1) to add to the value, or substantially prolong the useful life, of property owned by the taxpayer, such as plant or equipment, or (2) adapt property to a new or different use."[100] Improvement costs add to a taxpayer's basis[101] in the asset or property.[102] These costs are accounted for upon asset disposition or over time through depreciation or amortization.[103] All indirect costs must also be capitalized.[104] The classification of a cost as either a business expense or a capital expenditure can thus have a critical impact on the timing of a taxpayer's cost recovery.[105] Some industries receive preferential treatment—such as the oil and gas industry, which can immediately deduct drilling and development costs from their taxes.[106]

C. CAPITAL GAINS & DEPRECIATION

The Tax Code grants preferential treatment to capital gains.[107] Recognized gains on the sale or exchange of property used in the trade or

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[95] I.R.C. § 162; *see also id.* § 179 (allowing small business to deduct up to one million of depreciable business assets); *id.* § 168(k).

[96] Plainfield-Union Water Co. v. Comm'r, 39 T.C. 333, 337 (1962) (explaining that such repairs did not "materially increase the useful life, value, or structural strength of the pipes involved, nor did it render those pipes suitable for any new or additional use by petitioner"); *see also* 26 C.F.R. § 1.162-4 (2015).

[97] Estate of Walling v. Comm'r, 373 F.2d 190, 193 (3d Cir. 1967). *See also* Brent Kirwan, *A Clash of Titans: Tax Policy v. Environmental Policy, How to Harmonize Section 198 with Traditional Tax Analysis While Promoting Environmental Policy*, 31 TEMP. J. SCI. TECH. & ENVT'L LAW. 119, 131 (2012).

[98] Interstate Transit Lines v. Comm'r, 319 U.S. 590, 593 (1943).

[99] Treas. Reg. § 1.263-1(a) (2014).

[100] Rev. Rul. 94–38, 1994-1 C.B. 35; *see also* I.R.C. § 263(a); Treas. Reg. § 1.263(a)-1(b) (2014).

[101] *See* I.R.C. § 1001 (defining "amount realized"); *id.* § 1011 (defining "adjusted basis"); *id.* § 1012 (defining "cost basis").

[102] ANNE L. ALSTOTT, MICHAEL J. GRAETZ & DEBORAH. H SCHENKL, FEDERAL INCOME TAXATION: PRINCIPLES & POLICIES 42, 310 (8th ed. 2018).

[103] I.R.C. §§ 167, 195.

[104] *Id.* § 263A.

[105] *See* INDOPCO, Inc., v. Comm'r, 503 U.S. 79 (1992) (ruling that if an asset is deemed a capital expenditure, otherwise deductible expenses such as legal fees and acquisition, then expenses must also be capitalized).

[106] I.R.C. § 263(c).

[107] *See id.* §§ 1(h)(1)(A) (providing preferential rates) and 1221 (defining "capital assets").

business receive preferential treatment under I.R.C. § 1231 ("Section 1231").[108] This treatment would apply to developers who realize gains from selling real property to customers. However, these gains are subject to "depreciation recapture."[109]

The Tax Code allows taxpayers to deduct a "reasonable allowance for the exhaustion, wear and tear" of certain property.[110] Any depreciation taken by the taxpayer reduces their basis in the property.[111] Depreciation is intended to reflect the actual decline in the value of property.[112] Thus, if the property later sells for more than the taxpayer's basis, they must "pay back" prior depreciation.[113] However, real property (real estate) has a distinct advantage over personal property because the required threshold for reporting prior depreciation as ordinary income is higher.[114] Recaptured depreciation gains on I.R.C. § 1245 ("Section 1245") property—generally, personal property—are taxed at ordinary rates on *all* depreciation deductions.[115] On the other hand, most gains attributable to prior depreciation on real property, unless held for a year or less, are taxed at 25%.[116]

D. REVENUE RULINGS

In the early 1990s, the IRS received questions about the deductibility of various costs related to environmental remediation. The Agency issued a set of contradictory rulings that failed to clarify the guidelines. In 1994, the IRS declared that "the appropriate test for determining whether the expenditures increase the value of property is to compare the status of the asset after the expenditure with the status of that asset before the condition arose that necessitated the expenditure . . . ."[117] Under this test, a self-contaminating taxpayer may deduct costs incurred to clean up land the taxpayer had contaminated with hazardous waste because it "restore[s] the land to its

[108] *Id.* § 1231.
[109] ALSTOTT ET. AL., *supra* note 102, at 593.
[110] I.R.C. § 167*; see also id.* § 168.
[111] I.R.C. § 1016.
[112] ALSTOTT ET. AL., *supra* note 102, at 593.
[113] *Id.*
[114] *See* BORIS I. BITTKER, MARTIN J. MCMAHON JR., LAWRENCE A. ZELENAK & BRUCE A MCGOVERN, FEDERAL INCOME TAXATION OF INDIVIDUALS § 33:4 Westlaw (database updated December 2023).

The principal differences between § 1245 and § 1250 are that (1) except for property held for one year or less, § 1250 ordinarily recaptures depreciation only to the extent that the deductions exceeded the amount that would have been allowed had the taxpayer used the straight-line method, while § 1245 recaptures all depreciation deductions, and (2) § 1250 reduces the amount to be recaptured on dispositions of certain classes of property on a sliding scale that depends on the length of the taxpayer's holding period for the property. . . . But since, even for real property placed in service by the taxpayer before 1981, § 1250 recaptures only the excess of cumulative accelerated depreciation over cumulative straight-line depreciation, as the two cumulative sums converge, and ultimately reverse relative magnitudes, with each passing year fewer and fewer properties remain subject to § 1250 recapture at all.

[115] I.R.C. § 1245(a)(1).

Except as otherwise provided in this section, if section 1245 property is disposed of the amount by which the lower of--

(A) the recomputed basis of the property, or

(B) (i) in the case of a sale, exchange, or involuntary conversion, the amount realized, or

(ii) in the case of any other disposition, the fair market value of such property,

exceeds the adjusted basis of such property shall be treated as ordinary income. Such gain shall be recognized notwithstanding any other provision of this subtitle.

[116] *Id.* § 1(h)(1)(E)(i). This portion is known as "unrecaptured section 1250 gain." *Id*. § 1(h)(6).
[117] Rev. Rul. 94-38.

original condition" rather than "prolong[ing] the [land's] useful life [or]. . . adapt[ing] [the land] to a new or different use."[118] Yet the construction of a water treatment facility must be capitalized because it "provide[s] significant future benefits."[119] In a subsequent ruling, the IRS declared the cost to replace an underground storage tank to be a repair "despite [it] having some future benefits."[120] Later, the IRS modified both of these positions *but only for the manufacturing industry*.[121] The IRS announced that while remediation costs for self-inflicted manufacturing pollution are deductible under I.R.C. § 162 ("Section 162") for any taxable year on or before February 6, 2004, they must be capitalized as inventory costs under I.R.C. § 263A after that date.[122] This ruling creates uneven abatement costs between disparate waste producers.[123]

E. I.R.C. SECTION 198

In the Taxpayer Relief Act of 1997, Congress authorized taxpayers to deduct expenses for "any qualified environmental remediation expenditure, under newly added Section 198."[124] Qualified environmental remediation expenditures include expenses "paid or incurred in connection with the abatement or control of hazardous [waste]."[125] Section 198 was doomed from the start because of structural flaws and the lack of long-term authorization.

Section 198 created minimal incentives for taxpayers. Taxpayers could not deduct any expenses if the remediation occurred on a National Priorities Listed ("NPL") site.[126] Therefore, cleanup efforts could not be directed at the highest contamination sites.[127] Section 198 prohibited taxpayers from deducting the cost of depreciable property used in repairing the property, creating high barriers of entry for would-be developers.[128] Even where deductions were permitted, they provided meager enticements. Section 198 treated remediation expenses, even for real property, as a deduction for depreciation under Section 1245.[129] Upon subsequent sale, gains up to the deduction account receive ordinary income treatment.[130] In contrast, most

[118] *Id.*
[119] *Id.*
[120] Rev. Rul. 94-12; Rev. Rul. 98-25.
[121] Rev. Rul. 2004-18.
[122] *Id.*
[123] Administrative difficulties occur because any tax will induce behavioral changes among manufacturing firms, but not others. If the tax rate is raised to induce a shift among all polluters, it will disproportionately impact manufacturers. *See* Jean-Philippe Barde & Olivier Godard, *Economic Principles of Environmental Fiscal Reform*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 33, 36.
[124] 42 U.S.C. § 9601. For a definition of "qualifying property," *see* I.R.C. § 198(a)(3) ("An area shall be treated as a qualified contaminated site with respect to expenditures paid or incurred during any taxable year only if the taxpayer receives a statement from the appropriate agency of the State in which such area is located.").
[125] I.R.C. § 198(b)(1)(B).
[126] *Id.* § 198(c)(2).
[127] EPA, ABOUT THE SUPERFUND PROCESS (2022), https://www.epa.gov/superfund/about-superfund-cleanup-process#npl [https://perma.cc/DPZ7-CU4U] (explaining the NPL standards).
[128] I.R.C. § 198(c).
[129] *Id.* § 198(e).
[130] This meant that if any gain were realized on the property, the taxpayer would have to pay back the prior deduction. *See* Treas. Reg. § 1.1245-1(e)(2)(ii)(A) (Excess depreciation recapture is "a partner's share of depreciation or amortization with respect to property equals the total amount of allowed or allowable depreciation or amortization previously allocated to that partner with respect to the property.").

depreciation on real property would receive a preferential rate of 25%. Thus, the deduction was limited to the "time value of money," which has historically generated a low rate of return.[131]

Section 198 was originally scheduled to sunset in 2000, but Congress extended it in two-year increments before finally terminating it in 2011.[132] Despite these tax incentives being available, most taxpayers elected to forgo the deductions.[133] The lack of long-term authorization created too much uncertainty for would-be developers to trust that the deduction would be available.[134]

From a tax perspective, firms that violate environmental laws receive preferential treatment compared to those that take preemptive measures and acquire contaminated land.[135] In contrast to Section 198, Section 162(f) allows taxpayers to deduct payments made to a government agency for the remediation of the environment, wildlife, or natural resources when such actions are necessary to "come into compliance with a law."[136] Both noncompliant firms and brownfield purchasers can deduct cleanup expenses against ordinary income the company receives at the time of cleanup. However, if the property is subsequently sold for gain, the noncompliant firms only recognize the gain to the extent the sale exceeds their basis in the property, often at preferential rates. By contrast, the brownfield purchaser must recognize gain as *ordinary income up to the amount of remediation deductions*. Only the excess over the prior deductions is subject to preferential rates.

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[131] Donald Rutherford, *Time Value of Money*, *in* ROUTLEDGE DICTIONARY OF ECON. (3rd ed. 2013) (Time value of money is the "enhanced value of money arising from it being invested at interest over a time period"); *see also* Adam Hayes, *What is the Risk-Free Rate of Return, and Does It Really Exist?*, INVESTOPEDIA.COM (May 31, 2023), https://www.investopedia.com/terms/r/risk-freerate.asp [https://perma.cc/D29V-EH6Y]. The time value of money is measured by the risk-free rate of return, a theoretical rate of return for an asset with no risk. The risk-free rate is commonly based on U.S. Treasury bonds because the United States has almost no default risk. Treasury bonds have historically generated a low return when compared to risk-bearing investments.

[132] PETER M. FASS, ROBERT J. HAFT, LESLIE H. LOFFMAN & SANFORD C. PRESANT, TAX ASPECTS OF REAL ESTATE INVESTMENTS, § 10:77 Westlaw (database updated November 2022). For the standards of allowable deduction *see* EPA, A GUIDE TO FEDERAL TAX INCENTIVES FOR BROWNFIELDS REDEVELOPMENT 198 (2011), https://www.epa.gov/sites/default/files/2014-08/documents/tax_guide.pdf [https://perma.cc/8XGK-6U8U] ("[Eligible] environmental cleanup costs are fully deductible in the year that they are incurred, rather than capitalized over time."). A taxpayer must meet three requirements to qualify: (1) "[t]he property must be owned by the taxpayer incurring the eligible cleanup expenses, and be used in a trade or business or for the production of income;" (2) "[h]azardous substances or petroleum contamination must be present or potentially present on the property;" and (3) the "taxpayers must obtain a statement from a designated state agency . . . that confirms the site is a brownfield and therefore eligible for the tax incentive." *Id.*

[133] EPA, A GUIDE TO FEDERAL TAX INCENTIVES FOR BROWNFIELDS REDEVELOPMENT (2011), https://www.epa.gov/sites/default/files/2014-08/documents/tax_guide.pdf [https://perma.cc/8XGK-6U8U].

[134] *Id.*

[135] This does not mean that a firm would be better off economically by waiting for CERCLA litigation. CERCLA is a notoriously expensive process that would likely leave the firm in a far worst economic position than taking preemptive action. *See, e.g.*, Lloyd S. Dixon, Deborah S. Drezner & James K. Hammit, *Private-Sector Cleanup Expenditures and Transaction Costs at 18 Superfund Sites*, EE-0265 ENVIRONMENTAL ECONOMICS RESEARCH INVENTORY 45 (1993) (estimating that firms, on average, spent $32 million on each cleanup site between 1981 and 1991).

[136] Treas. Reg. §1.162-21.

F. COURT CASES FOLLOWING SECTION 198

Despite the passage of Section 198, courts have refused to extend tax expenditures to purchasers of contaminated land. In *Dominion Resources, Inc. v. United States*, a company purchased contaminated land to build an office building.[137] The Fourth Circuit denied a deduction for the cost to remove asbestos and other contaminants because the expenses "substantially altered the [property's] character."[138] In *United Dairy Farmers, Inc. v. United States*, the taxpayer was likewise denied a deduction, despite the purchaser being unaware of the pollution and "overpay[ing] for the property."[139] The court declined to extend Revenue Ruling 94-38, stating that property conditions should not be evaluated "as of the time 'prior to the condition necessitating the expenditure.'"[140] Thus, because the condition existed at the time of purchase and the taxpayer "changed uses," the court required capitalization.[141] The court adopted a three-step test for determining a valid environmental remediation deduction: (1) The contamination must stem from the taxpayer's use of the property in the ordinary course of business; (2) repairs restored the property to its pre-contamination value; and (3) the repair did not enable the taxpayer to change their use of the property.[142]

Further, *Cinergy Corp. v. United States* provides an example of a taxpayer who received deductions for environmental remediation.[143] In *Cinergy*, the taxpayer removed asbestos from their office building that had deteriorated and begun to circulate in the air.[144] Despite this alteration increasing the value of the property above the pre-contamination value, the court ruled that because the primary purpose was to place the building back into an operating condition, "the addition of such minimal value" did not disqualify the taxpayer from a deduction.[145]

The IRS rulings and court decisions favor would-be polluters—even over unknowing land purchasers—because only those who pollute land can deduct the subsequent repair costs. This disparity disincentivizes investment in abandoned land because reclamation efforts require capitalization. To engage private-sector stakeholders, Congress must issue clear standards that ensure deductions will be available to would-be rehabilitators.

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[137] Dominion Resources, Inc. v. U.S., 219 F.3d 359 (4th Cir. 2000).
[138] *Id.* at 372.
[139] Brief for the Appellee at 6, United Dairy Farmers, Inc. v. United States, 267 F.3d 410 (6th Cir. 2001) (No. 00-3800), 2000 WL 35593388.
[140] United Dairy Farmers, Inc. v. United States, 267 F.3d 510, 517 (6th Cir. 2001).
[141] Brief for the Appellee, *supra* note 139, at 12–16.
[142] *United Dairy Farmers*, 267 F.3d at 519.
[143] Cinergy Corp. v. United States, 55 Fed. Cl. 489 (2003).
[144] *Id.* at 498.
[145] *Id.* at 516.

IV. PROPOSED TAX REFORM: METHODS FOR INCENTIVIZING ENVIRONMENTAL REMEDIATION WHILE ACHIEVING REVENUE NEUTRALITY

A. PRINCIPLES OF ENVIRONMENTAL TAXATION

In recent decades, as significant ecological challenges emerged, governments across the globe introduced environmental tax policies to "influence behavior in an environmentally positive manner"[146] either by taxing pollution or granting deductions for beneficial activities. An environmental tax is "any compulsory, *unrequited* payment to general government levied on tax- bases deemed to be of particular environmental relevance."[147] Though the field of environmental taxation is vast, many designs include two core concepts.

As stated earlier, the polluter-pays principle is the idea that the costs associated with waste should be incurred by those who cause it, rather than by the public. The tax base[148] "must represent . . . the cause of the environmental impact that the tax seeks to discourage."[149] To only tax the specific firms that cause pollution, however, would require an onerously high level of administrative work. Instead, the tax should be levied on industries where potential pollution is most likely to occur. Tax expenditures,[150] such as deductions or credits, violate the polluter-pays principle and should only be used when a market inefficiency causes or prolongs negative externalities. Environmental taxation also looks to reform tax codes to withdraw or discourage measures contrary to such purposes.[151]

Following social welfare principles, a tax should equal the private and social marginal costs[152] and "aim to ensure that prices accurately reflect the total costs of an activity, incorporating the cost of the impacts resulting from employing taxes."[153] This forces the polluter to *internalize* the cost of the *negative externalities they generate*.[154] Therefore, those designing a tax must consider demand responsiveness and allocative efficiency.[155]

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[146] Janet E. Milne & Mikael Skou Andersen, *Introduction to Environmental Taxation Concepts and Research*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 15.

[147] *Id*. (explaining that the field of environmental taxation evolved from concepts advanced by Arthur Pigou in his seminal work *The Economics of Welfare*."); *see Pigouvian Tax*, BLACK'S LAW DICTIONARY (11th ed. 2019) ("A tax imposed on products and activities that produce harmful and economically costly consequences for the public fisc."). However, environmental taxes differ from traditional Pigouvian taxes because their primary goal is raising revenues from environmentally related activities. Pigouvian taxes primarily serve to discourage the behavior. *See* Pedro M. Herrera Molina, *Design Options and Their Rationales*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 85, 90.

[148] *Tax Base*, BLACK'S LAW DICTIONARY (11th ed. 2019) ("The total property, income, or wealth subject to taxation in a given jurisdiction.").

[149] Molina, *supra* note 147, at 90.

[150] ALSTOTT ET. AL., *supra* note 102, at 310 (defining tax expenditures as "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability.").

[151] Milne & Andersen, *supra* note 146, at 23.

[152] *Id*. at 17.

[153] Philipp Preiss, *Externality Research*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 139, 141.

[154] *Negative externality*, BLACK'S LAW DICTIONARY (11th ed. 2018) ("An externality that is detrimental to another, such as water pollution from a nearby factory.").

[155] Lisa Akeson, Jonathan Michaeli, Greg Michaels & Mark Wenner, *A Profile of Tax Subsidies and Investment Behavior in Six Major Polluting Industries* (Env. Econ. Rsch. Inventory, Working Paper EE-0365, 1997), explaining important factors to consider when designing a tax:

The "least-cost-abatement" principle is the idea that the government should implement a uniform set of taxes on all polluters at a level commensurate with "the marginal net damage produced by that activity."[156] Each firm would thus be incentivized to reduce pollution to maximize profits.[157] An effective tax would "achieve an objective at the least social cost to society as it would induce each . . . polluter[] to abate pollution to the point where they each incur the same additional cost for the same reduction of pollution emission."[158] Environmental taxes thus improve economic efficiency and reduce transaction costs because firms have the flexibility to identify and implement the waste management solution that maximizes profits.[159]

An environmental tax is successful if it reduces pollution with *static* efficiency—that is, if the market "does not suffer from significant distortions, except for the environmental issue of concern" after the tax is levied.[160] The tax simply corrects a market failure, "achiev[ing] a 'first-best,' or optimal, allocation of resources . . . ."[161] In other words, the tax regime

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First, if the investment stimulated by a subsidy is larger than the tax revenue loss--a result that occurs when the investment demand elasticity is great than one--the subsidy will be relatively cost effective stimulus. If on the other hand., the investment response is much smaller, then government spending increases, or transfers to individuals with relatively high short run propensities to consume, would be more effective.

Second, if the tax policy change makes the tax burden equal across sectors and industries, then through competitive market forces, a pattern of efficient capital investment will occur that should maximize national output. If on the other hand, tax policy favors one sector or industry over another, the maximum output from a given stock of capital may or may not occur. In short, two public policy goals, high growth rates in the short-run and sustained long-term productivity may conflict. Over time the business community has grown accustomed to tax incentives but in times of budgetary austerity, policy makers may legitimately strive to reduce the cost of the incentives or at the very least determine their cost effectiveness.

[156] William J. Baumol & Wallace E. Oates, *The Use of Standards and Prices for Protection of the Environment*, 73 SWEDISH J. ECON. 42, 43 (1971).

[157] Environmental taxes could either be implemented at a firm or consumer level. However, they are likely to be most effective at the producer level because firms are more likely to respond to economic incentives than consumers. Furthermore, it is administratively easier to collect taxes at the producer level. *See* Helle Ørsted Nielsen, *Bounded Rationality in an Imperfect World of Regulations: What If Individuals are Not Optimizing*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 449 ("[B]usinesses resemble the model of profit maximization more than consumers resemble the model for utility maximization.").

[158] Molina, *supra* note 147, at 87.

[159] Faure & Weishaar, *supra* note 69, at 407.

[160] *See* Barde & Godard, *supra* note 123, at 38.

[161] William K. Jaeger, *The Double Dividend Debate*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 211. *See also* EPA, GUIDELINES FOR PREPARING ECONOMIC ANALYSIS CHAPTER 4: REGULATORY AND NON-REGULATORY APPROACHES TO POLLUTION CONTROL 1–2 (2010) (citation omitted).

Economic efficiency can be defined as the maximization of social welfare. An efficient market is one that allows society to maximize the net present value (NPV) of benefits: the difference between a stream of social benefits and social costs over time. The efficient level of production is referred to as Pareto optimal because there is no way to rearrange production or reallocate goods in such a way that someone is better off without making someone else worse off in the process. . . . Government intervention may be justified, however, when a market failure or externality exists . . . , in which case the government may attempt to determine the socially optimal point of production once such externalities have been internalized. Said differently, government analysts may evaluate which of the various policy approaches under consideration maximizes the benefits of reducing environmental damages, net the resulting abatement costs.

Conceptually, the socially optimal level is determined by reducing emissions until the benefit of abating one more unit of pollution (i.e., the marginal abatement benefit) — measured as a reduction in damages — is equal to the cost of abating one additional unit (i.e., the marginal abatement cost). In the simplest case, when each polluter chooses the level at which to emit according to this decision rule (i.e., produce at a level at which the marginal abatement benefit is equal to the marginal abatement cost), an

allows all nonpolluting goods to flow freely and does not broadly distort consumer preferences.[162]

Successful environmental taxes deter pollution because of the cost, and incentivize the adoption of technology that reduces pollution; this is known as "dynamic efficiency."[163] If firms develop more efficient abatement tools and strategies, they can achieve "double-cost savings" via fewer expenses for environmental repair and a lower tax burden.[164] If a tax is both statically and dynamically efficient, it mitigates pollution and facilitates adaptation in the face of increased ecological uncertainty.[165]

David Pearce proposes a second benefit or "double dividend" from environmental taxes' impact on tax revenues.[166] Over time, environmental taxes replace a corresponding portion of the tax on income and capital, lowering the tax liability of most taxpayers.[167] In doing so, these taxes align environmental objectives with traditional tax policy. Replacement shifts tax disincentives from productive activities such as productivity and investment to harmful actions.[168] Among the Organisation for Economic Co-Operation and Development ("OECD") countries, 6%–7% of tax revenue comes from environmental taxes.[169]

Currently, the United States falls behind most OECD countries in both environmental tax revenues[170] and patents on environmental technologies.[171] The Tax Code creates a market inefficiency for environmental remediation by granting incentives to polluters but not taxpayers attempting to remediate pollution.[172] Congress can address chemical pollution by amending the Tax Code in three ways. First, Congress must authorize expenditures to induce greater private-sector engagement in the cleanup of hazardous waste.[173] Such

efficient aggregate level of emissions is achieved when the cost of abating one more unit of pollution is equal across all polluters. Any other level of emissions would result in a reduction in net benefits.

[162] EPA, *supra* note 161, at 37.

[163] For a further explanation of dynamic efficiency, see Javier Cuervo and Ved P. Gandhi, *Carbon Taxes: Their Macroeconomic Effects and Prospects for Global Adoption—A Survey of the Literature* 13 (IMF Working Paper No. 98/73, 1998), https://doi.org/10.5089/9781451849431.001.

The dynamic efficiency results from the incentives that the price mechanism provides for research in, and development of, pollution abatement and energy efficient technologies. That is because economic agents (e.g., carbon emitters) have an incentive to find cost effective ways of achieving emission reductions. With a carbon tax, economic agents pay a tax on remaining emissions from the use of fossil fuels. Finding ways to use less fossil fuels, therefore, bestows cost savings for the firms, which then pay less in taxes due to reduced emissions. Similarly, with a system of tradable emission permits, such technology improvements allow the agents to have "spare" permits to sell in the market and receive pecuniary reward. *Id.*

[164] EPA, *supra* note 161, at 41.

[165] *See* Robin Kundis Craig, "*Stationary is Dead" — Long Live Transformation: Five Principles for Climate Change Adaption Law*, 34 HARV. ENV'T. L. REV. 9 (2010) (advocating for environmental law to shift from a stationary framework to a more adaptive model).

[166] David Pearce, *The Role of Carbon Taxes in Adjusting to Global Warming*, 101 ECON. J NO. 407 938, 938–48 (1990); Jaeger, *supra* note 16, at 214–15.

[167] *See* Pearce, *supra* note 166, at 940. ("Governments may then adopt a fiscally neutral stance using revenue finance reduction in incentive-distorting taxes such as income tax, or corporation tax.").

[168] Claudia Dias Soares, *Earmarking Revenues from Environmentally Related Taxes*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69, at 102, 110.

[169] Barde & Godard, *supra* note 123, at 41.

[170] ORG. FOR ECON. CO-OPERATION AND DEV., ENV'T TAX'N (INDICATOR) (2023).

[171] ORG. FOR ECON. CO-OPERATION AND DEV., PATENTS ON ENV'T TECHS. (2023).

[172] *See* discussion *infra* pp. 34–35.

[173] Tax reform is not the only plausible form of government intervention, but it is the most realistic. The EPA could be greatly expanded, or additional funding could be authorized to subsidize redevelopment efforts. Unfortunately, hyper-polarization is the norm in the United States. The EPA, in particular, has become a political bellwether. When combined with the high turnover in party control, it seems unlikely

measures are necessary when a market inefficiency creates inequity or injustice.[174] These tax expenditures should not be the only measurements taken. They are merely the bridge to address past market failures while introducing the second step: an effluent tax on hazardous waste disposal.[175] Through taxation, firms and consumers will internalize the cost of pollution and shift behavior toward less polluting methods.[176] Finally, the Tax Code must remove contradictory expenditures for environmentally harmful activities such as oil and gas production. These subsidies contribute to the market inefficiencies driving the chemical crisis in America today.[177]

B. TAX EXPENDITURES: BRIDGING THE GAP TO OVERCOME PAST MARKET FAILURES

This Note proposes three tax incentives to facilitate cleanups:

(1) site assessment credits to increase available information,
(2) immediate expensing to defray the cost of remediation, and
(3) expanded research and development credits for waste management and pollution abatement technologies.

1. Site Assessment Credit

Currently, parties interested in performing brownfield cleanups can apply for grant funding from the EPA.[178] For-profit organizations cannot qualify.[179] Congress should incentivize private investigations and information gathering by authorizing a tax credit for the brownfield assessments. To avoid abuse, developers who identify a potential brownfield must send a proposal to the appropriate local agency explaining why they believe the brownfield exists and the expected cost for assessment.

If the developer completes the assessment, they must then deliver a report of their finding to the EPA to receive the credit. Assessments benefit the government because even if the developer does not complete the cleanup,

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that the agency will be empowered with the necessary power to shape market forces. The federal deficit is a similar political maelstrom. *See* Karlyn Bowman, *Democrats and Republicans Divided on Climate Change*, FORBES (Apr. 19, 2019, 6:47 PM), https://www.forbes.com/sites/bowmanmarsico/2019/04/19/democrats-and-republicans-divided-on-climate-change/?sh=613b86a33198 [https://perma.cc/9JE4-S7G2]. *But see* Haley Davie & J. Baxter Oliphant, *More Republicans Say Stricter Environmental Regulations are 'Worth the Cost'*, PEW RSCH. CTR. (Feb. 7, 2019), https://www.pewresearch.org/fact-tank/2019/02/07/more-republicans-say-stricter-environmental-regulations-are-worth-the-cost [https://perma.cc/5KG5-SQPF] (explaining that many Republicans now favor greater environmental regulation).

[174] ARTHUR CECIL PIGOU & NAHID ASLANBEIUGUI, THE ECONOMICS OF WELFARE 192 (Taylor & Francis ed. 2002).

> It is plain that divergences between private and social net product of the kinds we have so far been considering cannot, like divergences due to tenancy laws, be mitigated by a modification of the contractual relation between any two contracting parties, because the divergence arises out of a service or disservice rendered to persons other than the contracting parties. It is, however, possible for the State, if it so chooses, to remove the divergence in any field by "extraordinary encouragements" or "extraordinary restraints" upon investments in that field.

[175] Molina, *supra* note 147, at 94.

[176] *See infra* pp. 30–33.

[177] *See infra* pp. 33–36.

[178] EPA, ENTITIES ELIGIBLE TO RECEIVE BROWNFIELD GRANTS (2022) (last updated Aug. 14, 2023), https://www.epa.gov/brownfields/entities-eligible-receive-brownfield-grants#not [https://perma.cc/SNE7-NLKM].

[179] *Id.*

they provide valuable information to the government.[180] Each review enhances the government's monitoring capabilities.[181] The EPA cannot investigate all potential brownfields on its own and must rely on information from others.[182] Empowering developers to assess the land will give the EPA greater information on where contamination is most significant and where it may need to devote further resources. If the government is concerned that this could become too costly, it should only grant credits for assessments in economically distressed communities.[183]

2. Immediate Expensing

Qualifying developers should be allowed to expense cleanup costs for brownfields immediately, as Section 198 previously authorized.[184] Taxpayers should be able to immediately expense the cost to purchase specific remediation technology and the cost to perform the cleanup. Congress should allow all subsequent gains to receive preferential treatment without Section 1245 recapture.[185] The positive externalities far outstrip any lost revenues. Further, if the cleanup improves the value of the surrounding areas, overall government revenues for the area would increase.[186]

One issue with previous iterations of Section 198 is that it was unclear to whom and to which projects deductions could be applied.[187] Many cleanup efforts fail to qualify because they add value to the land and therefore are capitalized improvements.[188] Congress could remove this uncertainty by specifying the qualifications for developers. Qualified developers should be those that (1) have equity in the property and risk exposure in undertaking the cleanup and (2) obtain approval by an appropriate state agency.[189] State approval was a requirement under the previous iteration of Section 198.[190] The approval statement should state that the qualified developer holds the property for the purpose of repairing the polluted property. This "purpose" would not be subject to judicial tests like that in *United Dairy Farmers*.[191]

Additionally, developers purchasing contaminated land should be allowed to use the cost basis of the polluter.[192] Their basis in the property

[180] EPA, 542-R-17-003, BROWNFIELDS ROAD MAP TO UNDERSTANDING OPTIONS FOR SITE INVESTIGATION AND CLEANUP 15–16 (6th ed. 2022) https://www.epa.gov/sites/default/files/2017-11/documents/brownfieldsroadmapepa542-r-12-001.pdf [https://perma.cc/2UK7-FX6Z] (explaining existing reporting requirements).

[181] *Id.* at 21–22 (describing the value of assessments).

[182] *Id.* at 4 (mentioning that the EPA has assessed 26,722 properties).

[183] Some states have used similar methods. *See, e.g.*, MASS. DEP'T. OF ENV'T. PROT., BROWNFIELDS REDEVELOPMENT TOOLBOX: A GUIDE FOR MASSACHUSETTS COMMUNITIES 34 (Dec. 2007).

[184] Others have argued that a credit should be offered instead of a deduction to match the dollar-for-dollar costs. *See e.g.*, Kirwan, *supra* note 97, at 141–47. Credits may induce greater engagement, but it is this author's opinion that credits for abatement costs overcompensate developers. TIF financing can assist developers with project financing, and a developer who successfully completes the cleanup can expect a healthy rate of return.

[185] I.R.C. § 162.

[186] *See* discussion *infra* Subsection II.A.4.

[187] *See* discussion *infra* pp. 22–23.

[188] *See* discussion *infra* Subsection III.C.

[189] I.R.C. § 198(c)(4) (defining "Appropriate State Agency").

[190] *Id.* § 198(c)(3) ("An area shall be treated as a qualified contaminated site . . . only if the taxpayer receives a statement from the appropriate agency of the State in which such area is located that such area meets the requirement of paragraph (1)(B).").

[191] United Dairy Farmers, Inc. v. United States, 267 F.3d 510, 517 (6th Cir. 2001).

[192] *See* I.R.C. § 1012.

should thus be deemed that of the property before contamination ("polluter-cost basis"). This solution provides two significant advantages to the developer: (1) it excludes subsequent gains up to the polluter-cost basis from the developer's taxable income,[193] and (2) it gives the developer the ability to claim losses if the property values never recover.[194] Given the uncertainty around property values, this incentive would be precious to investors.

To avoid abuse, if a developer fails to complete the cleanup, their basis should revert to their purchase price, and all prior deductions must be repaid. Completion requires inspection and signoff by the appropriate agency. In order to avoid falling into the same "restoration paradigm" that has foisted command-and-control measures, a cleanup should not be defined by the property's initial condition but by whether the land still poses a threat to the surrounding community and whether it can sustain human activity again.[195]

3. Research & Development

Existing technology is insufficient to address contamination sites in locations with complex hydrology.[196] Based on the methods available, many such sites will require remedial management for "decades or longer."[197] Better tools for assessment, monitoring, and diagnosing contamination are critical to reducing the time and cost of repair.[198] Vapor intrusion—or, the "migration of vapor-forming chemicals from any subsurface source into an overlying building"[199]—presents particular challenges because of the variation in the geographic distribution of contamination. The Tax Code provides numerous business-related credits designed to "stimulate activities it considers important . . . ."[200] Credits, unlike deductions, provide a dollar-for-dollar reduction in tax liability.[201] I.R.C. § 41 ("Section 41") provides a credit for conducting certain research activities.[202] Congress should extend Section 41 to explicitly extend the credit to research on environmental remediation and waste management technologies.[203] The overall goal of this credit should be "to increase humans', other species', society's, and ecosystems' *adaptive capacity*."[204] Over time, this provision should be phased out as environmental taxes are implemented.

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[193] *Id.* § 1001.
[194] *See id.* §§ 165, 1012.
[195] *See* Kundis Craig, *supra* note 165, at 35.
[196] NAT'L RSCH. COUNCIL, *supra* note 56, at 114.
[197] *Id.* at 219.
[198] *Id.*
[199] EPA, WHAT IS VAPOR INTRUSION? (last updated Oct. 11, 2023), https://www.epa.gov/vaporintrusion/what-vapor-intrusion [https://perma.cc/GW5B-BAR8].
[200] BITTKER ET. AL., *supra* note 114, § 20:1.
[201] *Id.*
[202] I.R.C. § 41 ([Qualifying research includes expenses] "undertaken for the purpose of discovering information which is technological in nature, and the application of which is intended to be useful in the development of a new or improved business component of the taxpayer . . . .")
[203] Each business component must be assessed separately. *Id.* § 174. For an in-depth economic explanation of the role of R&D subsidies, see Herman Vollebergh, *The Role of Environmental Taxation in Spurring Technological Change*, *in* HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 69 at 360, 367–73.
[204] Kundis Craig, *supra* note 165, at 39. According to the IPCC:

Adaptive capacity is the ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behaviour and in resources and technologies. The presence of adaptive capacity has been shown to be a necessary condition for the design and implementation of effective adaptation strategies so as to reduce the likelihood and the magnitude of harmful outcomes

4. Positive Externalities from Expenditures

Brownfield remediation is projected to increase housing availability by 3.9% to 12.6% and drive job creation at rates between 3.3% and 11%.[205] Following cleanup, the annual residential property tax revenue from a single brownfield project increased from 5% to 15.2%.[206] In 2017, the study of forty-eight brownfield sites showed an increased residential tax base of $1.95 billion and $5.93 billion.[207] After accounting for assessment costs and, exemptions, and applying local tax rates, this produced between $29.1 million and $96.9 million in local tax revenues.[208] The Northeast-Midwest Institute estimates that the average brownfield cleanup cost is $602,000.[209] If this average is extrapolated to each of the forty-eight sites, even at the lowest estimate of $29.1 million, tax revenues would exceed the cost of cleanup ($28.8 million).

These incentives are necessary to counteract public health risks. However, if the expenditures are not accompanied by an environmental tax on waste-producing firms, they may actually *encourage* pollution because the public—not polluting firms or industries—bears the repair costs. Thus, these deductions and credits should be authorized in conjunction with a tax on hazardous waste disposals.

V. IMPLEMENTING ENVIRONMENTAL TAXES

A. TRANSITIONING THE COST OF EXTERNALITIES TO POLLUTERS

The Congressional Budget Office ("the CBO") proposes a carbon tax to reduce deficits over the decade 2023–2032.[210] Under the CBO proposal, a tax is imposed on each metric ton of greenhouse gases emitted, with gradual rate increases over time.[211] This plan projects an $865.4 billion reduction in the deficit.[212] Currently, implementing a carbon tax in the United States is unfeasible due to ideological polarization[213] and the politicization of climate

resulting from climate change. Adaptive capacity also enables sectors and institutions to take advantage of opportunities or benefits from climate change, such as a longer growing season or increased potential for tourism.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION, AND VULNERABILITY: CONTRIBUTION OF WORKING GROUP II TO THE ASSESSMENT REPORT OF THE IPCC 727 (2007).

[205] EPA, 560-R-20-001, ENVIRONMENTAL BENEFITS OF BROWNFIELDS REDEVELOPMENT— A NATIONWIDE ASSESSMENT 45 (May 2020).

[206] Karen A. Sullivan, *Brownfields Remediation: Impact on Local Residential Property Tax Revenue*, 19 J. ENV'T ASSESSMENT POL'Y & MGMT. 14 (2017).

[207] *Id.*

[208] *Id.*

[209] Evans Paull*, The Environmental and Economic Impacts of Brownfields Redevelopment* 10 *(*Ne. Midwest Inst., Working Draft for Distribution, 2008).

[210] CONG. BUDGET OFFICE, OPTIONS FOR REDUCING THE DEFICIT, 2023 TO 2032 VOLUME I: LARGER REDUCTIONS 88 (Dec. 2022).

[211] *Id.*

[212] *Id*.

[213] *Political Polarization in the American Public*, PEW RSCH. CTR. (June 12, 2014), https://www.pewresearch.org/politics/2014/06/12/political-polarization-in-the-american-public [https://perma.cc/NT3S-DTM3] (June 12, 2014); Alec Tyson, *On Climate Change, Republicans are Open to Some Policy Approaches, Even as They Assign the Issue Low Priority*, PEW RSCH. CTR. (July 23, 2021), https://www.pewresearch.org/fact-tank/2021/07/23/on-climate-change-republicans-are-open-to-some-policy-approaches-even-as-they-assign-the-issue-low-priority [https://perma.cc/A7RF-9MTJ] (noting

change.[214] However, Americans have begun to coalesce around specific climate proposals,[215] and lawmakers have successfully advanced taxes aimed at particular behaviors.[216] To make further inroads, Congress should implement an effluent tax on hazardous waste producers as a preliminary step toward an all-inclusive carbon tax. Currently, waste taxes are administered only at the state level, with a wide discrepancy in tax rates.[217] As previously demonstrated, states are not well positioned to levy such a tax.[218] Furthermore, a "wider geographical scope increases the heterogeneity of marginal abatement costs, which is the determinant for increases in efficiency [of the tax]."[219]

The tax base should be "as broad as the scope of the environmental damage" and "should apply uniformly [to polluting industries] with [few (if any)] exceptions."[220] Congress should tax all industries that produce hazardous waste.[221] The taxable event should include any disposals or release of waste.[222] Large Quantity Generators ("LQGs") are firms that "generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste."[223] Among LQGs, five industries produced almost 85% of hazardous waste reported in 2021.[224] This tax base is in line with the polluter-pays principle. Least-cost abatement will be achieved because each firm is taxed evenly and reduces waste production to the level that maximizes profits.[225]

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that "67% of moderates compared with 41% of conservatives favor taxing corporations based on the amount of carbon emissions they produce").

[214] Sarah Murray, *How Climate Change Became Political*, FIN. TIMES (Oct. 31, 2021), https://www.ft.com/content/4bac715b-2812-4610-a528-dc8db9ecd635 [https://perma.cc/AX9J-MTB6].

[215] *See, e.g.*, Jeffrey M. Jones, *Climate Change Proposals Favored by Solid Majority in U.S.*, GALLUP (Apr. 11, 2022), https://news.gallup.com/poll/391679/climate-change-proposals-favored-solid-majorities.aspx?version=print [https://perma.cc/LF5E-ERYN]; Alison Spencer & Cary Funk, *Americans Largely Support U.S. Joining International Efforts to Address Climate Change*, PEW RSCH. CTR. (Mar. 9, 2022), https://www.pewresearch.org/fact-tank/2022/03/09/americans-largely-support-u-s-joining-international-efforts-to-address-climate-change [https://perma.cc/S9GB-RSZD].

[216] *See* IRS, IRS ISSUES SUPERFUND CHEMICAL EXCISE TAXES FAQS (last visited Dec. 23, 2022); *see also* I.R.C. §§ 4661–72 for the specific tax provisions.

[217] Jenkins & Maguire, *supra* note 85, at 4.

[218] *See supra* text accompanying notes 85–98.

[219] Chalifour et. al., *supra* note 81, at 253.

[220] Niles A. Braathen & James Greene, *Environmental Taxation: A Guide for Policy Makers*, ORG. FOR ECON. CO-OPERATION AND DEV., 1–5 (Sept. 2011) https://www.oecd.org/env/tools-evaluation/48164926.pdf [https://perma.cc/RMY2-5HD6]. The Basel Convention prevents geographic issues at a national level. Under the agreement, firms from prohibiting shipping hazardous waste to other countries, subject to limited exceptions. Though the United States is not currently a party to the agreement, it is a signatory. U.S. firms are prohibited from importing or exporting hazardous waste absent a pre-determined agreement. *See* EPA, INTERNATIONAL AGREEMENTS ON TRANSBOUNDARY SHIPMENTS OF HAZARDOUS WASTE (last updated Sept. 13, 2023) https://www.epa.gov/hwgenerators/international-agreements-transboundary-shipments-hazardous-waste [https://perma.cc/28C2-4KHZ].

[221] *See* 40 C.F.R. § 261.3(a) (2014) (defining hazardous waste).

[222] Including, but not limited to, on-site land disposal, on-site air releases, on-site surface water discharges, or off-site disposals and other releases. *See* 40 C.F.R. § 260.

[223] EPA, CATEGORIES OF HAZARD WASTE GENERATORS (last updated Nov. 8, 2023), https://www.epa.gov/hwgenerators/categories-hazardous-waste-generators [https://perma.cc/X8WS-969U].

[224] EPA, 2021 BIENNIAL HAZARDOUS WASTE REPORT (2021) https://rcrapublic.epa.gov/rcrainfoweb/action/modules/br/naics/view [https://perma.cc/RT9Z-HHD9]. The industries include: (1) basic chemical manufacturing; (2) petroleum and coal products manufacturing; (3) waste treatment and disposal; (4) iron and steel manufacturing; and (5) resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing. *Id.*

[225] Milne & Anderson, *supra* note 146, at 18–19.

More efficient competitors would likely enter the market under an effluent tax regime than command-and-control administrations because the tax would reduce the barrier to entry.[226] This would strengthen demand, effectively increasing the likelihood that polluters bear the tax incidence.[227] Greater competition would enable the government to remove prior research and development subsidies. Two conditions are required for technological advancement to improve environmental quality: (1) advancement must diminish "unit production cost," and (2) advancement must diminish the "marginal productivity of polluting inputs."[228] Thus, to spur innovation, the effluent tax rate must be set at a level substantial enough to make clean technology the least-cost-abatement option.

An effluent tax will also generate substantial revenues. If a rate of $8.28 per ton was applied,[229] the tax would raise nearly $149 million in revenues.[230] Initially, effluent tax revenues should be earmarked to cover the cost of the brownfield tax incentives.[231] Over time, the tax incentives should be phased out, and tax revenues should be given directly to state and local governments to finance cleanups in conjunction with TIF. Since the government would sponsor the cleanup (with polluter dollars), the developer would not bear any risk or uncertainty in performing the cleanup. With public control of the project, state and local governments could steer projects toward historically marginalized communities and promote environmental justice.

B. Removing Contradictory Tax Expenditures: Restoring Market Equilibrium in Energy Production

Environmental tax policy aims not only to tax ecologically damaging behavior and incentivize activities with positive externalities, but also advocates removing subsidies that promote environmentally harmful behavior.[232] Roughly half of the estimated brownfield sites in the United States are affected by petroleum.[233] Yet, the United States spends approximately $20.5 billion annually on *direct* coal, gas, and oil subsidies.[234] This figure represents only a portion of the public funding for fossil fuels because two-thirds of federal energy expenditures are tax deductions.[235] Oil and gas producers, including those performing hydraulic fracking, deduct $10.6 billion for the cost of drilling[236] and $9 billion for percentage depletion.[237] The same firms receive $7.8 billion in credits for "enhanced"

[226] Faure & Weishaar, *supra* note 69, at 410.

[227] Katri Kosonen, *Regressivity of environmental taxation: myth or reality?*, *in* Handbook of Research on Environmental Taxation, *supra* note 69, at 161, 162.

[228] Vollebergh, *supra* note 203, at 368.

[229] This is the Superfund excise tax rate for Lead Oxide. *See* I.R.C. § 4661.

[230] Based on the total tons of hazardous waste generated in 2021. *See* EPA, *supra* note 224.

[231] This would, however, prevent the government from using the added funds to decrease tax rates on capital and labor.

[232] Milne & Andersen, *supra* note 146, at 25.

[233] EPA, Petroleum Brownfields (last updated Nov. 6, 2023) https://www.epa.gov/ust/petroleum-brownfields [https://perma.cc/6KBP-VUQ3].

[234] Savannah Bertrand, *Fact Sheet | Proposals to Reduce Fossil Fuel Subsidies (2021)*, Env't and Energy Study Inst. (July 23, 2021) (estimating that when factoring in externalities, this total is closer to $649 billion per year).

[235] Janet E. Milne & Mikael Skou Anderson, *The Future Agenda for Environmental Taxation Research*, *in* Handbook of Research. on Environmental Taxation, *supra* note 69, at 492.

[236] I.R.C. § 263.

[237] *Id.* § 613.

oil recovery[238]—producing oil and gas from marginal wells[239] and producing fuel from an unconventional source.[240] The latter provides a benefit *explicitly* to hydraulic fracking methods.

Any effort to tax waste, pollution, or carbon will be in vain if these existing expenditures continue to exacerbate the market's inefficiency. These subsidies contribute to pollution and hinder investment and research in more efficient and environmentally sound technologies.[241] The OECD estimates that by phasing out fossil fuel subsidies, CO^2 emissions would decrease 10% by 2050.[242] Moreover, the market will force firms to invest in research and development to find less costly methods of energy production, making investment credit incentives redundant. Congress can remove these tax expenditures, producing a simplified Tax Code. Phasing out both investment incentives and harmful deductions generate additional revenues, yielding the desirable *double dividend effect*.

CONCLUSION

Climate change legislation must account for the challenging interplay of technological and chemical innovation, energy demands, politics, and changing ecological conditions. As Professor Robin Kundis Craig observes:

> In the broadest perspective, adaptation measures must embrace all aspects of human society simultaneously, from national security to changes in economic productivity; from energy production and distribution to national and regional infrastructure redevelopment; from food production, distribution, and agricultural practices to water supply; from local government planning and land use regulation to environmental regulation and natural resource management.[243]

Any successful measure to address our changing environment must involve as many stakeholders as possible. Reducing waste contamination is no exception. Command-and-control regulation has proven insufficient to induce cleanup efforts.[244] Similarly, state and local governments are ill-equipped to address the problem independently.[245]

This Note proposes a two-phase process to address hazardous waste pollution. First, to "bridge the gap" by providing tax credits for site assessments and immediate deductions to developers who undertake land

[238] *Id.* § 43.
[239] *Id.* § 45I.
[240] *Id.* § 45K.
[241] The goal of these subsidies is to keep energy prices low. However, the distributional impact of these expenditures discriminately benefits the wealthy. If the government is concerned about regressivity or providing support for low-bracket taxpayers, providing fuel vouchers to low-bracket taxpayers is a more efficient mechanism. *See generally*, INT'L ENERGY AGENCY, ORG. FOR ECON. CO-OPERATION AND DEV. & THE WORLD BANK, THE SCOPE OF FOSSIL-FUEL SUBSIDIES IN 2009 AND A ROADMAP FOR PHASING OUT FOSSIL-FUEL SUBSIDIES (2010).
[242] ORG. FOR ECON. CO-OPERATION & DEV., THE ECONOMICS OF CLIMATE CHANGE MITIGATION 15 (Fiona Hall ed., 2009). Note, however, that this estimate would involve all countries acting in concert to cut subsidies, not the United States alone.
[243] Kundis Craig, *supra* note 165, at 29.
[244] *See* discussion *infra* Section II.B.
[245] *See* discussion *infra* Section II.C.

remediation.[246] Firms performing research and development on alternative chemicals and waste reduction technology should be granted credits for their efforts. Second, these expenditures should be implemented in conjunction with an effluent tax.[247] All hazardous waste producers should be taxed on land, water, and air disposals at a rate equivalent to the externality cost. Taxation is an advantageous solution compared to command-and-control regulation because it allows firms to identify the least-cost-abatement method.[248] This tax also serves as a "pilot study" for a complete carbon tax. The effluent tax should be implemented concurrently with a phase-out of harmful expenditures.[249] Deductions and credits for oil and gas production have created the market inefficiency we face today, and this inefficiency must be removed to move forward.[250] The artificially low price of fossil fuel stifles innovation, prolongs outdated technology, and furthers environmental contamination.

[246] *See* discussion *infra* Section III.A.
[247] *See* discussion *infra* Section III.B.
[248] *See infra* p. 3 & notes 1–14.
[249] *See* discussion *infra* Section II.C.
[250] *See infra* pp. 34–36 and notes 210–231.