The Poverty of Theory: Public Problems, Instrument Choice, and the Climate Emergency

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The instrument choice debate has been a fixture of environmental law for much of the last three decades. While this debate has led to a much sharper focus on the relative merits of different regulatory tools in confronting environmental problems, it has also left the field unprepared to conceive and implement an adequate response to complex, multifaceted challenges such as climate change. Using the case of emissions trading, this Article investigates how the instrument choice debate has impoverished our conception of government and limited our capacity to respond to the climate crisis. The central claim is that the overly abstract theory of instrument choice that has underwritten widespread enthusiasm for emissions trading and other forms of carbon pricing over the last three decades has led to a sharply diminished view of public engagement and government problem solving. In advancing this claim, the Article makes three main contributions. First, it provides a critical intellectual and institutional history of emissions trading that, for the first time, situates it within a broader history of instrument choice in law, economics, and political science. Second, it uses this history to develop and demonstrate a more reflexive and critical theory of policy instruments and government problem solving, showing

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how the mainstream instrument choice debate has constrained our conceptions of the regulatory state and its capacity for climate action in jurisdictions around the world. Third, and finally, it advances a series of normative claims that seek to rethink and reimagine a more responsive and expansive approach to government problem solving in the face of the looming climate emergency.

I. INTRODUCTION

For more than thirty years, the instrument choice debate has preoccupied environmental law, dramatically reshaping our conception of the regulatory state and its capacity to respond to environmental challenges.[1] The looming climate emergency,

1. *See*, *e.g.*, Jonathan Baert Wiener, *Global Environmental Regulation*: *Instrument Choice in Legal Context*, 108 YALE L.J. 677, 679 (1999) ("Contests to crown the best regulatory instrument have been the ceaseless sport of environmental law."). As understood here, a policy instrument is a discrete method or mechanism that structures action in a particular way to address a particular problem. Within the field of environmental law, examples include health-based standards, product-safety requirements, technology controls, performance standards, taxes, fees, tradeable permits, and information disclosure requirements, among others. The instrument choice

together with other crises such as the COVID-19 pandemic and structural inequality, make clear that the policy instrument theory of state capacity we have been working with since the 1980s is woefully inadequate.[2] The idea that we can select the appropriate tool from a menu of options to solve the problem at hand has proved to be both politically naïve and unworkable in practice in the face of complex challenges. While there is a widespread recognition in the current moment that we need a new, reinvigorated conception of government to respond to the multiple, compounding crises that we confront, we still have some significant intellectual house cleaning to do in order to understand the legacies of the instrument choice debate and what an alternative approach might look like.

This Article takes up that task. Using the case of emissions trading, the Article investigates how the instrument choice debate has impoverished our conception of government and limited our capacity to respond to the climate crisis. It argues that the overly abstract theory of instrument choice that has underwritten widespread enthusiasm for emissions trading and other forms of carbon pricing over the last three decades has worked to diminish our understanding of climate change as a broad *public* problem and has undermined our ability to mobilize the power of government to respond. In advancing this argument, the Article situates emissions trading within a broader history of instrument choice in law, economics, and political science, showing how the debate over regulatory

debate thus refers to the question of which instrument is most appropriate for a particular problem or set of problems. Within environmental law, much of the debate has been structured around the relative merits of more prescriptive instruments, such as standards, and market-based instruments, such as taxes or tradable permits. *See* Parts I and II *infra* for a more detailed discussion. It is important to recognize, however, that the instrument choice debate and the approach to government that it represents goes well beyond environmental law. For a broad survey of policy instruments across multiple domains, see THE TOOLS OF GOVERNMENT: A GUIDE TO THE NEW GOVERNANCE (Lester M. Salamon ed., 2002). For a recent general survey of policy instruments in environmental law, see POLICY INSTRUMENTS IN ENVIRONMENTAL LAW (Kenneth R. Richards & Josephine van Zeben eds., 2020).

2. As used here, "the policy instrument theory of state capacity" refers to a conception of government problem-solving focused on the collection of tools and techniques that governments deploy in response to specific problems. It is a highly technocratic conception of state capacity that often ignores the people, relationships, and institutional frameworks that allow governments to do their work and implement specific policies. The phrase is taken from SASKIA SASSEN, TERRITORY, AUTHORITY, RIGHTS: FROM MEDIEVAL TO GLOBAL ASSEMBLAGES 227 (2006). *See also* Parts I and III.A *infra*.

instruments in environmental law reflected and drew upon conceptual trends that had been underway since the middle of the twentieth century. The Article then uses this history to develop and demonstrate a more reflexive and critical theory of policy instruments and government problem solving that uncovers some of the ways in which the mainstream instrument choice debate has constrained our conceptions of the regulatory state and its capacity for climate action. Finally, the Article advances a series of normative claims that seek to rethink and reimagine a more responsive and expansive understanding of public problems and state capacity in the face of an accelerating climate crisis.

The choice of emissions trading is important for at least two reasons. First, the general enthusiasm for emissions trading among economists, lawyers, and policymakers grew directly out of the instrument choice debate of the last quarter of the twentieth century and in many ways reflects the power and influence of that framing. Second, emissions trading and other forms of carbon pricing have dominated climate policy discussions for almost three decades.[3] In the process, they have emerged as among the most influential cosmopolitan policy projects operating in the world today, despite the fact that their actual record of success is quite limited and despite a growing recognition that they are not capable of doing the work needed to save the climate.[4]

3. *See*, *e.g.*, Joseph I. Lieberman, *To Market*, *To Market*, 8 ISSUES IN SCI. TECH. 25, 25–28 (1992) (arguing for a tradeable-permits approach to reducing carbon dioxide emissions); Shi-Ling Hsu, *Carbon Pricing*, *in* LEGAL PATHWAYS TO DEEP DECARBONIZATION IN THE UNITED STATES 70, 70 (Michael Gerrard & John C. Dernbach eds., 2019) ("Carbon pricing must clearly be a centerpiece of any portfolio of policies to achieve deep decarbonization."); Robert Stavins, *The Future of U.S. Carbon Pricing Policy*, 1 ENV'T & ENERGY POL. ECON. 8, 9 (2020) (arguing that "in the long term, a truly meaningful, economy-wide U.S climate policy will likely need to have carbon pricing at its core, either in the form of a carbon tax or a cap-and-trade system."). *See also* Part II *infra*. As is generally accepted in the economics and legal literatures, carbon pricing includes both emissions-trading systems and carbon taxes. Of course, emissions trading and pollution taxes can also be used for other pollutants.

4. *See*, *e.g.*, Endre Tvinnereim & Michael Mehling, *Carbon Pricing and Deep Decarbonization*, 121 ENERGY POL. 185, 185 (2018) ("Deep decarbonization requires wholesale transformation of the economy. . . . [I]nstruments geared toward cost reductions at the margin cannot be expected to achieve such structural change on their own."); Jessica Green, *Does Carbon Pricing Reduce Emissions*? *A Review of Ex Post Analyses*, 16 ENV'T RES. LETTERS 1, 2 (2021) (finding that carbon pricing schemes have had limited impacts on actual emissions and observing that "the mismatch between the

This is hardly the first Article to take a critical look at emissions trading. Within legal scholarship, David Driesen has offered vigorous criticisms over many years of some of the larger claims regarding the relative merits of emissions trading and carbon pricing compared to other more prescriptive forms of regulation.[5] Lesley McAllister's detailed analysis of several actually existing emissions trading programs has provided a powerful antidote to the theoretical case for emissions trading, revealing how specific issues of design and implementation can dramatically undermine performance.[6] And scholars working

incremental effects of carbon pricing and the demand for rapid decarbonization cannot be understated."). Today, some twenty-two percent of the world's greenhouse gas emissions are under a carbon price. *See* WORLD BANK GRP., STATE AND TRENDS OF CARBON PRICING 2020 7 (2020) (reporting that there are sixty-one carbon pricing initiatives in place or scheduled for implementation, covering twelve gigatons of carbon dioxide equivalent (GtCO2e) or about twenty-two percent of global GHG emissions). The average weighted price in these jurisdictions is far too low to drive emissions reductions at the scale or pace needed to have a chance of hitting stabilization targets that scientists indicate are necessary to avoid the worst impacts of climate change. *Id.* at 7–8 (reporting that the global average carbon price is around $2 per ton of CO_2, far below price estimates of $40–80/t$CO_2$ by 2020 and $50–100/t$CO_2$ by 2030 needed to cost-effectively reduce emissions in line with the temperature goals of the Paris Agreement).

5. *See*, *e.g.*, David M. Driesen, *Free Lunch or Cheap Fix*: *The Emissions Trading Idea and the Climate Change Convention*, 26 B.C. ENV'T. AFF. L. REV. 1, 4 (1998) (arguing that emissions trading functions as "a cheap fix" for climate change that will reduce innovation, undermine democratic accountability, and weaken efforts to address complex environmental problems); David M. Driesen, *Capping Carbon*, 40 ENV'T L. 1, 4–5 (2010) (discussing challenges of establishing caps in cap-and-trade programs and widespread use of best available technology assumptions to do so); David M. Driesen, *The Limits of Pricing Carbon*, 4 CLIMATE L. 107, 108 (2014) (observing that efforts to phase out fossil fuels around the world have not been driven by pricing policies but by prescriptive policies and mandates); David M. Driesen, *Putting a Price on Carbon*: *The Metaphor*, 44 ENV'T L. 695, 698 (2014) (arguing that carbon pricing is a form of "market essentialism [that] tends to undermine governmental institutions that must function well if we are to have a good society—including effective markets—and tends to obscure questions that we must address in order to effectively choose and design environmental protection instruments.").

6. *See*, *e.g.*, Lesley K. McAllister, *Beyond Playing* "*Banker*": *The Role of the Regulatory Agency in Emissions Trading*, 59 ADMIN. L. REV. 269, 270, 272 (2007) (finding that the role of the regulatory agency in cap-and trade-programs may "may well be more demanding and resource-intensive than its role in traditional regulation."); Lesley K. McAllister, *The Overallocation Problem in Cap-and-Trade*: *Moving Toward Stringency*, 34 COLUM. J. ENV'T L. 395, 397 (2009) (finding problems of over-allocation of emissions allowances under various cap-and-trade programs); Lesley K. McAllister, *Enforcing Cap-and-Trade*: *A Tale of Two Programs*, 2 SAN DIEGO J. CLIMATE & ENERGY L. 1, 27 (2010) (concluding that "under some conditions, environmental agencies may find cap-and-trade programs more difficult and costly to enforce than traditional regulation."); Lesley K. McAllister, *The Enforcement Challenge of Cap-and-Trade Regulation*, 40 ENV'T L. 1195, 1230 (2010) (concluding that the monitoring and enforcement burdened under cap-and-trade programs are considerable and a potential threat to program integrity).

within the field of environmental justice have long criticized the uneven distributional impacts of emissions trading, focusing on how these programs can exacerbate and add to the unequal pollution burdens already affecting frontline communities.[7]

Outside of law, longstanding critiques from the left have tended to see market-based approaches as a false solution—a doubling down on the logic of markets and neoliberalism that many see as the driving force behind global climate change.[8] Why should we accept, these critics ask, the current neoliberal order as inevitable, much less listen to those who insist that any response must take place within that system.[9] More centrist scholars have focused on political dynamics to explain the limits of emissions trading and other forms of carbon pricing, arguing that these instruments have been stifled by a lack of political will rather than by any inherent defects in the instruments themselves.[10] If politicians had the guts to use these instruments as intended, this argument holds, emissions trading or a carbon tax would be able to deliver substantial emissions reductions at significantly lower cost than alternative approaches. But, because they have so far been unable to muster sufficient political courage, policymakers have tended to adopt piecemeal and anemic carbon-pricing programs. The overall effect, as one observer put it, is more like a narcotic than a panacea.[11]

7. *See*, *e.g.*, Alice Kaswan, *Environmental Justice and Environmental Law*, 24 FORDHAM ENV'T L. REV. 149, 161 (2013) (discussing environmental justice criticisms of emissions trading).

8. *See*, *e.g.*, PHILIP MIROWSKI, NEVER LET A SERIOUS CRISIS GO TO WASTE: HOW NEOLIBERALISM SURVIVED THE FINANCIAL MELTDOWN 338 (2014) ("The project to institute markets in pollution permits is a neoliberal mid-range strategy, better attuned to appeal to neoliberal governments, NGOs, and the more educated segments of the populace, not to mention the all-important FIRE [finance, insurance, and real estate] sector of the economy.").

9. *See*, *e.g.*, Larry Lohman, *Financialization, Commodification, and Carbon*: *The Contradictions of Neoliberal Climate Policy*, 2012 SOC. REG. 85, 90 (2012) ("Like other ecosystem services markets, carbon markets aim at creating and stabilizing new areas for capitalist activity, but also, more fundamentally, at securing those background conditions for accumulation that are most dependent on fossil fuels and most threatened by calls for emission cuts.").

10. *See*, *e.g.*, Joseph E. Aldy & Robert N. Stavins, *The Promise and Problems of Pricing Carbon*: *Theory and Experience*, 21 J. ENV'T & DEV. 152, 173–74 (2012) (discussing political challenges to cap-and-trade and other market-based approaches to reducing greenhouse gas emissions).

11. *See, e.g.*, Jeffrey Ball, *Why Carbon Pricing Isn't Working*, FOREIGN AFFS. 135 (2018) ("The result is that a policy prescription widely billed as a panacea is acting as a narcotic.").

While there are elements of truth in all of these criticisms, they also miss the deeper political rationalities that are embedded within the instrument choice frame itself. Indeed, as this Article argues, a principal but previously unexamined reason emissions trading and other forms of carbon pricing have not lived up to expectations is because they rest upon an overly abstract theory of instrument choice that has led to a deeply unrealistic view of public engagement, policy development, and government problem solving. In advancing this argument, the Article explains how a particular conception of policy instruments underwrote efforts within economics and law to reconceive the task of environmental protection as a choice among different tools.[12] This then paved the way for the comparative evaluation of such instruments, with market-based instruments almost always coming out on top when compared to older, more prescriptive forms of regulation.[13] The resulting theoretical debate over instrument choice that has preoccupied environmental law since the mid-1980s has stunted our collective ability to imagine, much less to implement, a realistic way forward on climate change.

There are lessons here not only for climate policy, but also for environmental law and broader studies of regulation. Within environmental law, in particular, a critical analysis of the instrument choice debate is long overdue. As Jonathan Wiener observed more than twenty years ago, "[c]ontests to crown the best regulatory instrument have been the ceaseless sport of environmental law."[14] For all of its insights, however, that literature has never looked in any sustained way at how we came to view policies as instruments in the first place and what effects this framing has had on our understanding of various problems and the possibilities for response. As for broader studies of regulation and governance, there is much to learn from a more critical genealogy of the policy instrument idea and its impact

12. *See* Part II.A *infra*.

13. *Id*.

14. *See* Jonathan Baert Wiener, *Global Environmental Regulation*: *Instrument Choice in Legal Context*, 108 YALE L.J. 677, 679 (1999). *See also id.* at 682 ("[A]fter thirty years of head-to-head competition in both theory and practice, analysts appear to have converged on [the] presumption[] . . . that incentive-based instruments such as taxes and tradeable allowances should generally be chosen over technology requirements and fixed emissions standards because the incentive-based instruments are typically far more cost-effective and innovation-generating than their alternatives.").

on prevailing views of government problem solving and state capacity.

The Article proceeds as follows. Part I elaborates on the overall framework. It argues that the mainstream technocratic framing of instrument choice in environmental law and policy needs to be situated and understood historically as a distinctive political rationality—that is, as a particular approach to governing. Doing that allows us to move outside of the comparative assessment of different instruments (the traditional frame of the instrument choice debate) to investigate and explain how instruments acquire normative momentum in the first place—where they come from, how they get stabilized as legitimate objects of inquiry and investment, how they acquire the capacity to travel, and how they shape the ways in which we see problems and imagine different ways of responding. Such an undertaking is necessarily more historical, contextual, and reflexive than mainstream understandings of environmental regulation.[15] It looks at policy instruments not as abstract, neutral tools available for governments to use depending on the problem at hand but as historically situated technologies that are actively produced and reproduced by specific actors and institutions and that carry with them a specific politics of knowledge and social control. By "following the policy"—both intellectually and institutionally—we can begin to unpack the ideologies, networks, and infrastructures

15. My use of the term "reflexive" here focuses on the need for critical engagement with how environmental law scholarship has itself shaped the conceptual and practical terrain on which particular approaches to environmental problems are legitimated and how the instrument choice debate as a whole has influenced the way we understand government problem solving. As used here, the term should not be confused with what Eric Orts calls "reflexive environmental law"—a term that he introduced in the mid-1990s partly in response to the instrument choice debate and which draws upon Gunther Teubner's notion of reflexive law. In Orts's view, reflexive environmental law is an alternative to traditional forms of prescriptive regulation as well as market-based approaches—one that relies upon the adoption of practices of evaluation and decision making within individual firms that will facilitate their efforts to mitigate environmental harms in an ongoing dynamic manner without having to rely upon direct government regulation. *See* Eric Orts, *Reflexive Environmental Law*, 89 NW. U.L. REV. 1227, 1252–54 (1995) (describing key features of reflexive environmental law); Gunther Teubner, *Substantive and Reflexive Elements in Modern Law*, 17 LAW & SOC'Y REV. 239, 239 (1983) ("Reflexive law is characterized by a new kind of legal self-restraint. Instead of taking over regulatory responsibility for the outcome of social processes, reflexive law restricts itself to the installation, correction, and redefinition of democratic self-regulatory mechanisms.").

that allow specific policies to spread and the implications this has for efforts to harness the power of government to solve complex problems.[16]

Part II applies this framework to the case of emissions trading. It starts with a critical intellectual history of emissions trading that locates it within deeper conceptual shifts in law, economics, and political science regarding policy instruments and their comparative evaluation. In tracing this story, Part II shows how a particular, and largely inaccurate, history of emissions trading became accepted wisdom and, as such, how it contributed to the larger mobilization of market-based instruments in environmental law starting in the 1980s. Part II also provides an assessment of emissions trading in practice, showing how the actual spread of emissions trading has often been highly contingent, driven more by pragmatic experiments or the political inability to adopt other approaches than by its supposed theoretical virtues or actual success. In fact, as Part II demonstrates, the continued popularity of emissions trading and other forms of carbon pricing as leading tools to reduce greenhouse gases around the world has been less a product of their inherent merits than the result of a robust transnational network of professionals, consultants, and policy entrepreneurs who have provided a critical and often self-serving infrastructure to support their spread.[17] In virtually all

16. *See*, *e.g.*, Jamie Peck & Nik Theodore, *Follow the Policy*: *A Distended Case Approach*, 44 ENV'T & PLAN. A: ECON. & SPACE 21, 24 (2012) (calling for "critical investigations of those multi-sited social processes through which policy rationales, rationalities, and routines are constructed and reconstructed, made and unmade."). *See also* Jan-Peter Voß & Arno Simmons, *Instrument Constituencies and the Supply Side of Policy Innovation: The Social Life of Emissions Trading*, 23 ENV'T POL. 735, 736 (2014) ("Our approach is to follow the instruments along their innovation journeys, a course that often starts from vague design notions and tentative practices and sometimes ends with dominant models, which are taken up in global policy toolboxes . . . and shape policymaking practices across jurisdictions and domains.").

17. *See*, *e.g.*, JAMIE PECK & NIK THEODORE, FAST POLICY: EXPERIMENTAL STATECRAFT AT THE THRESHOLDS OF NEOLIBERALISM xv (2015) ("The acceleration in cross-border policy traffic is also reflected, if not enabled, by the veritable industry . . . that has sprung up around 'best practice' codification, practitioner conferences, learning exchanges, knowledge transfer, and communities of practice, a world that is populated by a mobile class of policy gurus, entrepreneurs, consultants, bloggers, evaluator-advocates, and model peddlers."). Voß & Simmons use the term "instrument constituencies" to capture aspects of this infrastructure supporting the spread of particular policy instruments. *See* Voß & Simmons, *supra* note 16, at 747 (describing instrument constituencies as involving "the work of specialized academics, research institutes and think tanks,

instances where emissions trading has been adopted in practice, moreover, substantial challenges have emerged in building and maintaining these markets, highlighting the critical but all-too-often neglected role of implementation in delivering on the promises of particular interventions.[18]

Part III steps back and offers some thoughts on what a more realistic and critical theory of instrument choice might look like, with particular attention to climate policy. It argues that policy instruments are not simply tools, but carry with them their own politics of knowledge and social control that shape and format the ways in which problems are understood and the possibilities for response. Borrowing from John Dewey, Part III seeks to recover and revise the idea of *public* problems as a basis for government action.[19] Rather than seeing problems through the narrow frame of instrument choice, this notion of public problems sees the spillovers, harms, and long-term consequences of a complex industrial society as problems that emerge from and call forth new publics.[20] By framing problems such as climate change not as a market failure best addressed by getting the prices right but as a problem of collective concern—that is, a problem for which we have shared but differentiated responsibilities—we can begin to see how new

dedicated departments at international organizations, committed advocacy groups, and task forces in parties and public administration").

18. *Cf.* MATT ANDREWS ET AL., BUILDING STATE CAPABILITY: EVIDENCE, ANALYSIS, ACTION 2 (2017) ("[A]rticulating a reasonable policy is one thing; actually implementing it successfully is another. . . . All manner of key questions pertaining to the replication and 'scaling up' of policies and programs deemed to be 'successful' turn on whether adequate implementation capability is (actually or potentially) present.").

19. *See* JOHN DEWEY, THE PUBLIC AND ITS PROBLEMS 39 (1927) ("[T]he perception of consequences which are projected in important ways beyond the persons and associations directly concerned in them is the source of a public; and that its organization into a state is effected by establishing special agencies to care for and regulate these consequences.").

20. *Id.* at 126 ("Indirect, extensive, enduring and serious consequences of conjoint and interacting behavior call a public into existence having a common interest in controlling these consequences. But the machine age has so enormously expanded, multiplied, intensified, and complicated the scope of the indirect consequences, have formed such immense and consolidated unions in action, on an impersonal rather than a community basis, that the resultant public cannot identify and distinguish itself. And this discovery is obviously an antecedent condition of any effective organization on its part. Such is our thesis regarding the eclipse which the public idea and interest have undergone."). *See also* ALAN RYAN, JOHN DEWEY AND THE HIGH TIDE OF AMERICAN LIBERALISM 28 (1995) ("Dewey's main intellectual concept was that of a 'problem.' Individuals and societies alike are stirred into life by problems.").

publics arise to take ownership of and demand responses to these problems. The gathering strength of the climate movement and its connections to broader concerns with structural inequality and systemic racism is an important example of this, demonstrating how new publics can coalesce into a potent political force. The Green New Deal, President Biden's Executive Order on the climate crisis, with its embrace of a whole-of-government approach and strong commitment to environmental justice, the proposed $2 trillion infrastructure package, and the President's recent commitment to reduce U.S. greenhouse gas emissions by 50% below 2005 levels by 2030[21] all recognize this, marking a possible inflection point in U.S. climate policy that embraces a broad public framing of the problem and a corresponding view of government intervention and problem solving that moves beyond the narrow, policy instrument theory of state capacity that has limited our ways of thinking and acting for far too long.

II. PUBLIC PROBLEMS AND THE INSTRUMENT CHOICE DEBATE

Over the last year, three massively complex and interrelated crises—the COVID-19 pandemic, the deep-seated problem of systemic racism and structural inequality, and the climate emergency—have converged and are crying out for powerful and sustained government responses. And yet, at least in the United States, we continue to struggle to find the tools, the shared experience, and the vocabulary to engage and respond in a manner commensurate with the scale of these problems. To be sure, the Biden administration has signaled a strong intention to mobilize the power of the federal government to respond to these problems and the new administration clearly recognizes the interrelated nature of these crises. But there are also strong counter currents confronting the effort to translate these early commitments into sustained government action—manifest in a

21. *See Recognizing the Duty of the Federal Government to Create a Green New Deal*, H.R. Res. 109, 116th Cong. (2019); Press Release, The White House, Executive Order on Tackling the Climate Crisis at Home and Abroad (Jan, 27, 2021), *available at* https://perma.cc/4DYB-T9XL; Press Release, The White House, Fact Sheet: The American Jobs Plan (March 31, 2021), *available at* https://perma.cc/4ZJJ-ZFAM; Press Release, The White House, Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies (April 22, 2021), *available at* https://perma.cc/N7LH-M8TH.

deep, ongoing distrust of government, unprecedented levels of polarization, widespread misinformation, and the corrosive effects of unconstrained political spending by corporate interests.

This Article argues that part of the challenge, particularly with respect to climate change, stems from a conception of government problem solving that is hollowed out and disconnected from the public and the kind of broad-based approaches to solving problems of collective concern that we so obviously need. In particular, it argues that the instrument choice debate, which has provided the dominant frame for much of environmental law in the United States and elsewhere for more than thirty years, has impoverished, constrained, and stunted our collective ability to imagine much less to implement a realistic way forward on climate change and other big complex problems.

As illustrated in more detail in Part II, the instrument choice debate in environmental law came of age in the 1980s and reflected an effort to reduce the task of solving environmental problems to a choice among different tools. Often framed as a battle between prescriptive "command-and-control" regulations, such as technology standards and mandates, and market-based approaches, such as taxes, fees, and tradable permits, the debate established a normative framework for evaluating different instruments against various criteria such as efficiency, fairness, and ease of administration. In doing so, it drew on deeper conceptual shifts in law, economics, and political science that had been underway since the middle of the twentieth century.

During the 1970s, a handful of environmental law scholars took up the question of instrument choice, reflecting the early import of economic ideas into the field.[22] But environmental law was still taking shape at the time, and the scholarly literature during the 1970s, along with some of EPA's early regulatory

22. *See*, *e.g.*, James Krier, *The Pollution Problem and Legal Institutions*: *A Conceptual Overview*, 18 UCLA L. REV. 429 (1971); Allan V. Kneese & Karl Goran-Maler, *Bribes and Charges in Pollution Control*: *An Aspect of the Coase Controversy*, 13 NAT. RES. J. 705 (1973); Lawrence J. White, *Effluent Charges as a Faster Means of Achieving Pollution Control*, 24 PUB. POL'Y 111 (1976); Bruce Yandle, *The Emerging Market in Air Pollution Rights*, 2 REGULATION 21 (1978); A. Mitchell Polinsky, *Controlling Externalities and Protecting Entitlements*: *Property Right*, *Liability Rule*, *and Tax-Subsidy Approaches*, 8 J. LEGAL STUD. 1 (1979).

actions and important appellate decisions, was marked by a diversity of approaches and concerns.[23] By the mid-1980s, however, the instrument choice debate had moved to center stage as prominent legal scholars mounted a full-throated attack on so-called first generation command-and-control approaches to pollution control and argued strongly in favor of emissions trading and other market-based approaches.[24] Much of this reflected the growing influence of law and economics on the field, all of which brought an increasing level of abstraction and formalism to environmental law scholarship.[25] While the field of environmental law has expanded and diversified in various ways since the 1980s, even a cursory review of the literature since that time reveals sustained and ongoing attention to the instrument choice debate.[26]

23. *See* DOUGLAS A. KYSAR, REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY 3–5 (2010) (discussing earlier understandings of environmental law that were "messy, pluralistic, and pragmatic" and that gave way, starting in the 1980s, to a more instrumental, economically oriented approach that has "continued unabated" to the present); William Boyd, *Genealogies of Risk*: *Searching for Safety*, *1930s–1970s*, 39 ECOLOGY L.Q. 895, 902 (2012) (arguing that the mid-1970s marked a moment of possibility for environmental law when the field could have gone in a more precautionary direction rather than embracing more formal, quantitative approaches to risk).

24. Bruce Ackerman and Richard Stewart were the prime movers here. Key works from the 1980s include Richard B. Stewart, *Regulation*, *Innovation*, *and Administrative Law*: *A Conceptual Framework*, 69 CAL. L. REV. 1256 (1981); Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); Richard B. Stewart, *Economics*, *Environment*, *and the Limits of Legal Control*, 9 HARV. ENV'T L. REV. 1 (1985); Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*: *The Democratic Case for Market Incentives*, 13 COLUM. J. ENV'T L. 171 (1988); and Richard B. Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 COLUM. J. ENV'T L. 153 (1988). A survey of the environmental law review literature revealed more than 60 articles on some aspect of instrument choice during the 1980s, a pace of scholarly production that has continued up until the present. *See also* Part II.A.2 *infra* (discussing influence of Ackerman and Stewart on the field).

25. *See* Part II.A.1 *infra* (tracing influence of environmental economics on environmental law during this time).

26. Representative works from the 1990s include Cass Sunstein, *Paradoxes of the Regulatory State*, 57 U. CHI. L. REV. 407 (1990); Sidney A. Shapiro & Thomas O. McGarity, *Not So Paradoxical*: *The Rationale for Technology-Based Regulation*, 1991 DUKE L.J. 729 (1991); Howard Latin, *Regulatory Failure*, *Administrative Incentives*, *and the New Clean Air Act*, 21 ENV'T L. 1647 (1991); John Dwyer, *The Use of Market Incentives in Controlling Air Pollution*: *CA's Marketable Permits Program*, 20 ECOLOGY L.Q. 103 (1993); Oliver Houck, *Of Bats*, *Birds and B-A-T*: *The Convergent Evolution of Environmental Law*, 63 MISS. L.J. 403 (1994); Eric Orts, *Reflexive Environmental Law*, 89 NW. U.L. REV. 1227 (1995); Lisa Heinzerling, *Selling Pollution*, *Forcing Democracy*, 14 STAN. ENV'T L.J. 300 (1995); Richard Pildes & Cass Sunstein, *Reinventing the Regulatory State*, 62 U. CHI. L. REV. 1 (1995); Rena L. Steinzor, *Reinventing*

Together with quantitative risk assessment and cost-benefit analysis, the comparative evaluation of policy instruments sought to discipline and formalize environmental decision making. In retrospect, these various approaches operated together as a package of neoliberal reforms aimed at replacing earlier commitments to rights, precaution, and expert judgment with a more abstract and reductive approach that would force the work of environmental protection to run along more well-defined grooves.[27] In the process, questions of politics and public engagement were cabined and pushed to the side.

Indeed, despite much lip service regarding the need to attend to institutional and political context, the instrument choice debate has tended to operate at a very high level of abstraction.[28] Policy instruments, in this view, are often treated as discreet tools or widgets—an approach that may be necessary for making systematic comparisons, but one that also has significant costs when it comes to understanding how policies get translated into actual programs. By disembedding the processes of policy design, implementation, and diffusion from their institutional

Environmental Regulation: *The Dangerous Journey from Command to Self-Control*, 22 HARV. ENV'T L. REV. 103 (1998); Nathaniel O. Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENV'T L. REV. 313 (1998); Jonathan Baert Wiener, *Global Environmental Regulation*: *Instrument Choice in Legal Context*, 108 YALE L.J. 677 (1999); Dan Esty, *Toward Optimal Environmental Governance*, 74 N.Y.U. L. REV. 1495 (1999). For representative works during the last two decades, *see* Kenneth R. Richards, *Framing Environmental Policy Instrument Choice*, 10 DUKE ENV'T L. & POL'Y F. 221 (2000) (part of a symposium on instrument choice in the same journal); Wendy E. Wagner, *The Triumph of Technology-Based Standards*, 2000 U. ILL. L. REV. 83 (2000); Daniel A. Farber, *Triangulating the Future of Reinvention*: *Three Emerging Models of Environmental Protection*, 2000 U. ILL. L. REV. 61 (2000); David M. Driesen, *The Economic Dynamics of Environmental Law*: *Cost-Benefit Analysis*, *Emissions Trading*, *and Priority-Setting*, 31 B.C. ENV'T AFF. L. REV. 501 (2004); Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795 (2005); James Salzman, *Teaching Policy Instrument Choice in Environmental Law*: *The Five P's*, 23 DUKE ENV'T L. & POL'Y F. 363 (2013); and John Dernbach, *The Dozen Types of Legal Tools in the Deep Decarbonization Toolbox*, 39 ENERGY L.J. 313 (2018).

27. This package of policy instruments, which would also include nudges and other behavioral policy instruments that became popular in the 2000s, can also be seen as part of the "minimalist" style of public administration and public law identified by Charles Sabel and William Simon. *See* Charles F. Sabel & William H. Simon, *Minimalism and Experimentalism in the Administrative State*, 100 GEO. L.J. 53, 54–55, 64 (2011).

28. *See*, *e.g.*, Robert W. Hahn, *The Impact of Economics on Environmental Policy*, 39 J. ENV'T ECON. & MGMT. 375, 376 (2000) ("[E]conomists need to do more than simply develop good ideas to influence policy. They need to understand how the political process affects outcomes, and actively market the use of appropriate and feasible economic instruments for promoting more efficient environmental policy.").

contexts, the widget view of policy instruments has left us with a diminished understanding of the conditions of possibility for responding to complex problems.

More important, and this is a key focus of this Article, it is well past time to reflect critically on how the instrument choice debate itself has constrained the manner in which we have come to understand and approach the climate change challenge. To that end, this Article argues that one of the most consequential effects of the longstanding debate over instrument choice has been its impact on our understanding of how the public can take ownership of a problem such as climate change and build a coherent, collective strategy adequate to the task at hand.[29] The enthusiasm for market-based approaches and the policy instrument theory of state capacity that this entails has worked to narrow our range of vision in ways that we may not fully appreciate—stifling our ability to see climate change as a collective, *public* problem by asking us instead to view it as a market failure that can be fixed by proper adjustment of the price system which will in turn channel individual economic behavior into more climate friendly pursuits.[30] The logic of such a position is decidedly hostile to anything that seeks to articulate and act upon what earlier generations referred to as the public interest or the common good, while making it difficult to harness the power of the state to direct investment and prepare for a future that avoids the worst impacts of climate change. Simply put, it is past time to put climate policy into a more fulsome

29. *Cf.* DEWEY, *supra* note 19, at 67 ("A public articulated and operating through representative officers is the state; there is no state without a government, but also there is none without the public."); BLAKE EMERSON, THE PUBLIC'S LAW: ORIGINS AND ARCHITECTURE OF PROGRESSIVE DEMOCRACY 89–93 (2019) (discussing Dewey's concept of the public and its problems and its implications for democratic decision-making and state capacity).

30. *Cf.* Douglas A. Kysar, *Law*, *Environment*, *and Vision*, 97 NW. U.L. REV. 675, 676 (2003) (arguing that "the failure of existing environmental trading programs to inspire serious democratic deliberation about environmental goals is caused in no small part by a fundamental conceptual flaw in our background assumptions about the natural world and its relation to our economic activity."). While the argument advanced here is sympathetic to Kysar's argument, the focus is quite different. Where Kysar attends to what he calls the "pre-analytic" vision that structures our background assumptions and conceptual choices, my focus is on the ways in which the progressive abstraction of the policy instrument idea has narrowed our range of vision with respect to the possibilities of harnessing government to solve complex problems.

conversation with changing conceptions of the state as a step toward reimagining what meaningful climate action looks like.

Although polling suggests that a substantial majority of the public now agrees on the need for climate action,[31] it is worth reminding ourselves of just how serious the problem has become. Hardly a day goes by when we are not bombarded by reports of fire,[32] drought,[33] melting ice sheets,[34] flooding,[35] extreme heat,[36] species loss,[37] and human suffering[38] caused by a warming climate. In the summer of 2019, the United Nations reported that the world was experiencing one new climate-related disaster a week.[39] Climate change is no longer a problem of the future. It is a problem of the here and now.[40]

And it is a problem that appears to be coming at us faster than scientists and climate models indicated even just a few short years ago, with some scientists suggesting that the Earth system is perilously close to a series of inter-related tipping points that

31. *See* Damian Carrington, *UN Global Climate Poll: 'The People's Voice is Clear – They Want Action',* THE GUARDIAN (Jan. 27, 2021), *available at* https://perma.cc/K48R-ARY9; Alec Tyson & Brian Kennedy, *Two-Thirds of Americans Think Government Should Do More on Climate*, PEW RSCH. CTR. (June 23, 2020), *available at* https://perma.cc/BM8N-UBHF.

32. *See, e.g.*, Philip E. Higuera & John T. Abatzoglou, *Record-Setting Climate Enabled the Extraordinary 2020 Fire Season in the Western United States*, 27 GLOB. CHANGE BIOLOGY 1 (2021); John T. Abatzoglou & A. Park Williams, *Impact of Anthropogenic Climate Change on Wildfire Across Western US Forests*, 113 PROC. NAT'L ACAD. SCIS. 11,770 (2016).

33. *See, e.g.*, Benjamin I. Cook et al., *Climate Change and Drought: From Past to Future*, 4 CURRENT CLIMATE CHANGE REPS. 164 (2018).

34. *See, e.g.*, Frank Pattyn & Mathieu Morlighem, *The Uncertain Future of the Antarctic Ice Sheet*, 367 SCIENCE 1331 (2020).

35. *See, e.g.,* Oliver Milman, *Sea Level Rise Accelerating Along US Coastline, Scientists Warn*, THE GUARDIAN (Feb. 3, 2020), *available at* https://perma.cc/4SE4-94L4.

36. *See* Henry Fountain, *Billions Could Live in Extreme Heat Zones Within Decades, Study Finds*, N.Y. TIMES (May 4, 2020), *available at* https://perma.cc/J6PM-K7CX; Chi Xu et al., *Future of the Human Climate Niche*, 117 PROC. NAT'L ACAD. SCIS. 11350 (2020).

37. *See* Gerardo Ceballos et al., *Vertebrates on the Brink as Indicators of Biological Annihilation and the Sixth Mass Extinction*, 117 PROC. NAT'L ACAD. SCIS. 13596 (2020).

38. *See* William J. Ripple et al., *World Scientists' Warning of a Climate Emergency*, 70 BIOSCIENCE 8 (2020) ("[G]reenhouse gas (GHG) emissions are still rapidly rising, with increasingly damaging effects on the Earth's climate. An immense increase of scale in endeavors to conserve our biosphere is needed to avoid untold suffering due to the climate crisis.").

39. "This is not about the future, this is about today," UN Secretary General's Special Representative on Disaster Risk Reduction Mami Mizutori explained. *See* Fiona Harvey, *One Climate Crisis Disaster Happening Every Week, UN Warns*, THE GUARDIAN (Jul. 7, 2019), *available at* https://perma.cc/2X8V-24CT.

40. *Id.*

could pose "an existential threat to civilization."[41] Over the last several years, as evidence of the climate emergency has grown, urgent calls for action by an increasingly diverse range of constituencies, led in many ways by the youth movement, have become much harder for policymakers to ignore.[42]

The scale of human suffering that we are beginning to witness (and that will only get worse) is staggering. At the extremes, hundreds of millions of people face worsening subsistence crises and massive displacement that manifest in chronic hunger, starvation, forced migration, violence, and bare life.[43] In 2019, for the sixth year in a row, the number of people in the world suffering from chronic hunger increased in absolute terms, rising to 690 million (about one out of every eleven human beings on the planet).[44] The main cause of the increase, according to the U.N. Food & Agriculture Organization, has been conflict exacerbated by climate change.[45] Much of the increase is concentrated in sub-Saharan Africa, though hunger is also on the rise in Latin America.[46] For many millions of others, widespread loss of economic opportunity translates into

41. *See* Ripple et al., *supra* note 38, at 9–10 ("The climate crisis has arrived and is accelerating faster than most scientists expected. It is more severe than anticipated, threatening natural ecosystems and the fate of humanity."); Timothy M. Lenton et al., *Climate Tipping Points: Too Risky to Bet Against*, 575 NATURE 592, 592 (2019) ("[E]vidence is mounting that [tipping points in the Earth system, such as loss of the Amazon rainforest or the collapse of the West Antarctic ice sheet,] could be more likely than was thought, have high impacts and are interconnected across different biophysical systems, potentially committing the world to long-term irreversible changes"); *id*. at 595 ("If damaging tipping cascades can occur and a global tipping point cannot be ruled out, then this is an existential threat to civilization.").

42. *See, e.g.*, Somini Sengupta, *Protesting Climate Change, Young People Take to Streets in a Global Strike*, N.Y. TIMES (Sep. 20, 2019), *available at* https://perma.cc/D9MU-JCDK.

43. *See, e.g.*, CHRISTIAN PARENTI, TROPIC OF CHAOS: CLIMATE CHANGE AND THE NEW GEOGRAPHY OF VIOLENCE (2011).

44. *See* FAO, THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD: TRANSFORMING FOOD SYSTEMS FOR AFFORDABLE HEALTHY DIETS viii (2020), *available at* https://perma.cc/7WEH-ADGJ. This represented an increase of 60 million people since 2014. According to the report, "the COVID-19 pandemic may add an additional 83 to 132 million people to the ranks of the undernourished in 2020." *Id*. The report also notes that "[t]wo billion people, or 25.9 percent of the global population, experienced hunger or did not have regular access to nutritious and sufficient food in 2019" and that more than one in five children in the world are stunted because of malnutrition. *Id*.

45. *See* FAO, THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD: BUILDING CLIMATE RESILIENCE FOR FOOD SECURITY AND NUTRITION xii (2018), *available at* https://perma.cc/MS9D-TNH9. *See id*. at xiv ("Climate variability and extremes are a key driver behind the recent rises in global hunger and one of the leading causes of severe food crises.").

46. *Id.*

diminished livelihoods, material deprivation, and displacement. Worldwide, the UN and others have estimated that the number of "climate migrants" could reach more than one billion by 2050.[47] Even if the real number is a small fraction of that,[48] it represents an astonishing number of people on the move that will create enormous strains not only on the resources but also on the capacity for mercy in the places where they will seek refuge.

And yet, the overall record of climate action remains dismal. Global carbon dioxide emissions from fossil fuels rose again in 2019, hitting an all-time high of 36.8 billion tons.[49] Although the impacts of the COVID-19 pandemic on economic activity led to a significant reduction in global fossil fuel emissions for 2020 (around seven percent), there is no reason to expect that a return to more normal economic activity will not bring emissions back up to historic levels.[50] Meanwhile, emissions from deforestation and land use are up significantly, driven largely by major increases in tropical deforestation in the Brazilian Amazon (up more than 25% over the last year and roughly double the rate of five years ago).[51] Notwithstanding recent signs that some

47. *See* Jon Henley, *Climate Crisis Could Displace 1.2bn People by 2050, Report Warns*, THE GUARDIAN (Sept. 9, 2020), *available at* https://perma.cc/Y9GD-LT9Q.

48. *See* Ingrid Boas et al., *Climate Migration Myths*, 9 NATURE CLIMATE CHANGE 901, 901–02 (2019) (raising concerns about the "false narrative that predicts large numbers of 'climate refugees'" that works to "entrench[] climate migration as a looming security crisis without an empirical scientific basis").

49. *See* Pierre Friedlingstein et al., *Global Carbon Budget 2019*, 11 EARTH SYS. SCI. DATA 1783 (2019); G. P. Peters et al., *Carbon Dioxide Emissions Continue to Grow Amidst Slowly Emerging Climate Policies,* 10 NATURE CLIMATE CHANGE 3 (2019); R.B. Jackson et al., *Persistent Fossil Fuel Growth Threatens the Paris Agreement and Planetary Health*, 14 ENVTL RES. LETTERS 1, 1–2 (2019) (reporting that the temporary slowdown in CO_2 emissions growth from 2014 to 2016 was followed by three years of increases, with a projected increase of fossil fuel CO_2 emissions in 2019 to a record 36.8 billion tons).

50. *See* Corinne Le Quéré et al, *Temporary Reduction in Daily Global CO_2 Emissions During the COVID-19 Forced Confinement*, 10 NATURE CLIMATE CHANGE 647, 648–49 (2020) (estimating a 17% decline in CO_2 emissions in April 2020, relative to April 2019, as a result of the COVID-19 confinement); Corinne Le Quéré et al, *Fossil CO_2 Emissions in the Post-COVID-19 Era*, 11 NATURE CLIMATE CHANGE 197, 198 (2021) ("Although the measures to tackle the COVID-19 pandemic will reduce emissions by about 7% in 2020, they will not, on their own, cause lasting decreases in emissions because these temporary measures have little impact on the fossil fuel-based infrastructure that sustains the world economy.").

51. *See* Mikaela Weisse & Elizabeth Goldman, *Primary Rainforest Destruction Increased 12% from 2019 to 2020*, WORLD RES. INST. GLOB. FOREST REV., *available at* https://perma.cc/U9Y5-85TN (last accessed Apr. 22, 2021) (reporting that deforestation

countries are prepared to increase their climate ambition, even if all of the countries of the world are able to fully implement their current pledges under the Paris Agreement (and the current evidence suggests that they are not on track to do so) the world is still expected to experience warming of at least 3°C — double the 1.5°C limit that the Intergovernmental Panel on Climate Change (IPCC) and virtually all climate scientists see as necessary to avoid the worst impacts of climate change.[52] It is a damning indictment on any register.

Climate policy, needless to say, now stands at a critical juncture, with very little time left to start reducing global emissions on a schedule that is aggressive enough to have a chance of achieving the Paris Agreement target of limiting warming to "well below 2°C"[53]—a target that requires reaching net-zero emissions globally by mid-century, less than thirty years from now.[54] While recently announced climate commitments by major corporations and financial institutions are a welcome development, even if embarrassingly late, it is clear that voluntary private sector initiatives cannot substitute for action by governments at all levels.[55]

In the negotiating halls of the United Nations Framework Convention on Climate Change (UNFCCC) and in national and subnational governments around the world, hopes are once again stirring for carbon pricing in one form or another as policymakers struggle to the find the means to respond.[56] One

in Brazil in 2020 increased by 25% from 2019 and was more than double the amount of 2015).

52. *See* IPCC, GLOBAL WARMING OF 1.5°C (2018), *available at* https://perma.cc/RB2P-K938.

53. *See* Paris Agreement to the United Nations Framework Convention on Climate Change, art. 2(1)(a), Dec. 12, 2015, T.I.A.S. No. 16-1104 [hereinafter "Paris Agreement"], *available at* https://perma.cc/9XVS-2HPL (calling upon parties to limit "the increase in the global average temperature to well below 2°C above pre-industrial levels and pursu[e] efforts to limit the temperature increase to 1.5°C above pre-industrial levels.").

54. The IPCC projects that in order to limit warming to 1.5°C, the world will need to reach net-zero emissions of CO_2 by 2050 and net-zero emissions of all greenhouse gases by the 2060s. Achieving a target of 2°C would require net-zero emissions of CO_2 by 2070. *See* Joeri Rogelj et al., *Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development*, *in* GLOBAL WARMING OF 1.5°C, *supra* note 52.

55. *See, e.g.*, Annie Massa, *BlackRock Puts Climate at Center of $7 Trillion Strategy*, BLOOMBERG (Jan. 14, 2020), *available at* https://perma.cc/45JJ-M839.

56. *See, e.g.,* U.N. CLIMATE CHANGE NEWS, *Calls Increase to Use Carbon Pricing as an Effective Climate Action Tool* (Sep. 22, 2020), *available at* https://perma.cc/2XM2-LAH3

would be forgiven for feeling a bit of *déjà vu* in all of this. During the first decade of the 21st century, carbon markets were all the rage. But in the decade following the financial crisis, enthusiasm declined significantly. Today, carbon markets are a pale shadow of what proponents hoped they would become during the early 2000s.[57]

But carbon pricing seems poised for a possible second act.[58] During the negotiations leading up to the Paris Agreement, major international organizations, such as the United Nations, the International Monetary Fund, and the World Bank enthusiastically endorsed carbon pricing as the policy instrument of choice for reducing greenhouse gases in order to achieve the Paris target of limiting global warming to "well below 2°C."[59] National governments have likewise voiced substantial and widespread support for using emissions trading, and to a lesser extent carbon taxes, as the principal means of meeting their Nationally Determined Contributions (NDCs) under the Paris Agreement.[60] By 2019, according to the World Bank, 22% of global emissions were under some form of carbon

("As countries prepare their updated national climate action plans, known as NDCs, which are essential to meet the temperature targets agreed under the Paris Climate Change Agreement, momentum is growing to put a price on carbon pollution as a means of bringing down emissions and driving investment into cleaner options.").

57. In June 2008, Commissioner Bart Chilton of the Commodities Futures Trading Commission (CFTC) observed in a speech that carbon markets had experienced an average annual growth rate of more than 300% per year since 2002, and that these emissions markets "could overtake all other commodity markets at some point down the road." Based on conservative assumptions, he predicted a $2 trillion futures market for carbon emissions. Bart Chilton, Commissioner of the CFTC, Speech at the Finance IQ Second Carbon Trading Conference (Jun. 25, 2008), *available at* https://perma.cc/5CP8-8A2F. Needless to say, these rosy expectations were off by several orders of magnitude. Last year, the total value of the global carbon markets was around €229 billion (or $270 billion), 90% of which was attributed to the European Union's Emissions Trading System. *See* REFINITIV, CARBON MARKET YEAR IN REVIEW 2020 (2021), *available at* https://perma.cc/8B8W-5ED5.

58. *See* BARRY G. RABE, CAN WE PRICE CARBON? 205 (2018) ("Despite all of its political struggles, carbon pricing appeared to catch a second wind toward the end of the 2010s.").

59. *See, e.g.,* MAI FARID ET AL., AFTER PARIS: FISCAL, MACROECONOMIC, AND FINANCIAL IMPLICATIONS OF CLIMATE CHANGE 5 (2016), *available at* https://perma.cc/J6X7-QKXD ("For reducing carbon emissions ('mitigation'), carbon pricing (through taxes or trading systems designed to behave like taxes) should be front and center.").

60. *See, e.g.,* WORLD BANK GRP., *supra* note 4, at 86 (2020) (reporting that 97 parties to the Paris Agreement, representing 58% of global greenhouse gas emissions, mention carbon pricing in their NDCs).

price.[61] This percentage is expected to grow in coming years as other countries adopt and expand emissions trading systems,[62] and could receive an additional boost if the UNFCCC Conference of the Parties is able to successfully complete negotiations on the rulebook for trading emissions reductions among countries under the Paris Agreement.[63]

Existing emissions trading programs also seem to be getting back on track. After several years of reform efforts, the European Union Emissions Trading System (EU ETS) finally appears to have resolved its severe over-allocation problem, with prices now significantly higher than they were in 2018.[64] In the U.S., the member states of the Regional Greenhouse Gas Initiative (RGGI) succeeded in tightening their cap in 2014, and California's cap-and-trade program has continued to function without major problems.[65]

Taken together, these developments might be read as a sign of progress that governments at various levels are finally getting serious about climate action. From the perspective of the deepening climate emergency, however, they reveal a stunning lack of courage and imagination. The plain truth of the matter is that emissions trading and carbon pricing are not up to the task, and the fixation on these instruments has distracted climate policy for far too long. Indeed, while the theoretical case for tradeable permits and other market-based approaches has

61. *Id.* at 7 (reporting that carbon pricing initiatives implemented or scheduled for implementation cover about 22% of global greenhouse gas emissions).

62. *Id*. at 19–20.

63. Specifically, negotiations over the rules for Article 6 of the Paris Agreement, which provide for a mechanism that allows countries to trade emissions reductions and could provide the basis for the integration of global carbon markets. *See* Paris Agreement, *supra* note 53, art. 6.

64. *See* EUR. COMM'N, REPORT ON THE FUNCTIONING OF THE EUROPEAN CARBON MARKET 5 (2020), *available at* https://perma.cc/R6JD-NUZ (reporting that legislative changes to address the surplus of allowances have led to a significant reduction in auction volumes and higher overall prices for allowances, notwithstanding a brief decline in prices during the spring of 2020 as a result of COVID-19). *See also* David Sheppard & Camilla Hodgson *Cost of Polluting in EU Soars as Carbon Price Hits Record €50,* FIN. TIMES (May 4, 2021) (reporting record high EU ETS allowance prices), *available at* https://www.ft.com/content/2b965427-4fbc-4f2a-a14f-3be6019f0a7c.

65. *See* RGGI, RGGI PROGRAM REVIEW—SUMMARY OF PROPOSED CHANGES TO RGGI REGIONAL CO_2 ALLOWANCE BUDGET 3 (2013), *available at* https://perma.cc/SE9H-2QKS (describing interim reduction of RGGI cap by 91 million short tons starting in 2014); ICAP, EMISSIONS TRADING WORLDWIDE: STATUS REPORT 2021 64 (2021) (reviewing recent performance of California cap-and-trade program).

been clear for more than forty years, real-world application has stumbled along for much of the last three decades, unable to deliver on their promises. Put bluntly, any honest reading of the historical record would reveal a policy instrument that has fallen far short of expectations. The obvious question is why.

While there has been a significant amount of commentary over the last several years pointing out the problems with carbon pricing, much of which echoes an older set of critiques, most of that literature still operates within the basic instrument choice frame.[66] In essence, these criticisms reduce to some version of the following: we made a mistake listening to economists and focused on the wrong tool for too long. The problem is now much worse and getting worse all the time, while carbon pricing has proved to be politically challenging and much harder to implement at the scale and pace that is necessary.[67] Now we need to go back to the tool shed to find other, more appropriate tools.

This Article has a different focus. Rather than engage in yet another round in the instrument choice debate, it investigates

66. *See, e.g.,* Daniel Rosenbloom et al., *Why Carbon Pricing Is Not Sufficient to Mitigate Climate Change—and How "Sustainability Transition Policy" Can Help*, 117 PROC. NAT'L ACAD. SCIS. 8664, 8668 (2020) (arguing that "the dominant logic of contemporary climate policy, in which carbon pricing is the central policy response, is deeply flawed"); Ines Azevedo et al., *The Paths to Net Zero: How Technology Can Save the Planet*, FOREIGN AFFS. (May/June 2020), *available at* https://perma.cc/TL5W-CHHB ("To close the gap between aspirations and reality [on decarbonization], governments need to grasp that they cannot rely solely on hard-to-enforce international agreements and seductive market-based approaches, such as carbon pricing, that will only work on the margins."); Jeffrey Ball, *Hot Air Won't Fly: The New Climate Consensus that Carbon Pricing Isn't Cutting It*, 2 JOULE 2491, 2491 (2018). For older critiques, see Joseph Romm, *Cleaning Up on Carbon*, 1 NATURE CLIMATE CHANGE 85, 86 (2008) (discussing limits of carbon pricing and urging an immediate focus on rapid deployment of clean technologies); Michael Wara, *Is the Global Carbon Market Working?* 445 NATURE 595, 596 (2007) (criticizing the clean development mechanism as an inefficient subsidy from industrialized to developing countries); Driesen, *Free Lunch or Cheap Fix*?, *supra* note 5, at 4 (arguing that emissions trading functions as a "cheap fix" that reduces short-term costs while undermining innovation and thwarting democratic accountability).

67. *See, e.g.,* DANNY CULLENWARD & DAVID G. VICTOR, MAKING CLIMATE POLICY WORK 7 (2020) ("The attractive academic logic of markets has become misaligned with the political realities of the climate problem."); Matto Mildenberger & Leah C. Stokes, *The Trouble With Carbon Pricing*, BOS. REV. (Sept. 24, 2020), *available at* https://perma.cc/F7HM-X2FB ("As a policy, carbon pricing has the politics backward. It starts by changing the incentives to pollute. Theoretically these incentives will undermine carbon polluters' economic and political power. But this puts the cart before the horse: we need to disrupt the political power of carbon polluters *before* we can meaningfully reshape economic incentives.").

how emissions trading, and carbon pricing more generally, emerged as policy orthodoxy in the fight against climate change over the last thirty years and what this reveals about our conception of government problem solving. Answering that question requires a more empirical investigation of how we came to think about the climate problem as amenable to these tools, why these particular instruments were able to gain normative momentum and travel around the world, and how their popularity has impacted the ability of governments to respond to climate change.

The key methodological lesson here is that we need to "follow the policy"—both geographically and historically. But in doing so, we need to be careful not to replicate the problem of reifying these policy instruments as stable objects that remain relatively intact as they travel.[68] We need histories of instruments that place them in context, investigating how they gain traction and develop over time and across different jurisdictions. That means looking at the role of experts, networks, and ideologies in the constitution of policy orthodoxies and always questioning why a particular approach is being advanced as the right fit for a particular problem.

It also means moving away from the policy instrument theory of state capacity to recognize instead that major government interventions are always works in progress—complicated political undertakings crafted under a particular set of circumstances and legal constraints, informed by particular understandings of problems, and based on a particular coalition of supporters. Successful policies, when measured in terms of their ability to deliver over time, cannot be reduced to a set of simple design choices. Policies are more than the sum of their parts. They have complicated, vernacular histories. Understanding those histories will help us make better policy—today and in the future.[69]

68. *See, e.g.,* Peck & Theodore, *supra* note 16, at 25.

69. *See* Paul Pierson, *The Study of Policy Development*, 17 J. POL. HIST. 34, 48 (2005) ("Shifting to a developmental perspective presses us . . . to pay more attention to the long-term sources of policy change, to address the central issues of policy sustainability, to consider the possibilities that in the long run 'small' outcomes may end up being very big, while 'big' ones end up being small, and to adapt our analyses to the reality of ubiquitous unintended consequences."); William Boyd, *The Clean Air Act's National Ambient Air Quality Standards: A Case Study of Durability and Flexibility in Program Design and Implementation*, *in* LESSONS FROM THE CLEAN AIR ACT: BUILDING

The normative conclusion that emerges from this is that the narrow, technocratic focus on instrument choice that has shaped so much of the mainstream discussion in environmental law and related fields since the 1980s has made it increasingly difficult to frame problems as sources of collective concern that can give rise to new publics. By focusing on tools and instruments, we have lost sight of the state as the "public articulated," to use John Dewey's phrase.[70] Put simply, the abstract, reductionist view of policy instruments that has preoccupied lawyers and policy professionals for almost half a century has disempowered and marginalized the public in ways that make it harder to solve big complicated problems. By design, they have pushed a more fulsome view of the public and its problems to the side.

III. FOLLOW THE POLICY: THE CASE OF EMISSIONS TRADING

This Part takes seriously the injunction from Part I to "follow the policy," tracing the intellectual and institutional history of emissions trading over the last half century. The goal is to explain how the idea of emissions trading emerged and gained traction based on an increasingly abstract conception of policy instruments and the implications of this for climate action in the United States and around the world. The key takeaway is that the popularity of emissions trading within the mainstream climate policy community over the last several decades has been less the result of its inherent merits and more a product of a particular ideological project to promote emissions trading by a relatively small, but influential, group of economists and lawyers, as well as substantial investments by a broader network of government leaders, policy professionals, consultants, environmental groups, and private firms. Viewed in this way, emissions trading represents one of the best examples of "fast policy" operating in the world today.[71] But the ways in which it achieved that status are not well understood.

ADAPTABILITY INTO U.S. CLIMATE AND ENERGY POLICY 15 (Ann Carlson & Dallas Burtraw eds., 2019) (showing how the success and durability of the Clean Air Act's National Ambient Air Quality Standards derives from history, structure, and process and cannot be reduced to a simple set of design choices).

70. DEWEY, *supra* note 19, at 67. *See also* EMERSON, *supra* note 29, at 84–95 (discussing Dewey's conceptions of the public and the state).

71. *See* PECK & THEODORE, *supra* note 17, at xxxi–xxxii ("Fast policy refers to a condition of deepening transnational interconnectedness, in which local policy

A. Emissions Trading in Theory

Most students of environmental regulation have a general sense of the history of emissions trading and how it fits within a broader narrative of the move to markets in environmental law.[72] One might call this the official or standard history, much of which has been actively produced by economists and other advocates over the last several decades.[73] This official history is important to understand because it has contributed substantially to the normative momentum behind emissions trading and, by extension, carbon pricing. Official histories operate in this respect as ideologies and, in doing so, perform important work in justifying continued investment in and commitment to particular approaches.

What follows is a critical analysis of the official history of emissions trading, showing how economists and legal scholars converged on the idea during the 1970s and 1980s as a superior alternative to what they came to characterize pejoratively as the

experiments exist *in relation* to near and far relatives, to traveling models and technocratic designs, and to a host of financial, technical, social, and symbolic networks that invariably loop through centers of power and persuasion."). Peck and Theodore use the cases of participatory budgeting and conditional cash transfers to illustrate the phenomenon of fast policy. In their view, fast policy is a distinctive form of neoliberal statecraft and, as such, fits within a broader trend of globalization of new forms of governance. *See, e.g.*, PIERRE DARDOT & CHRISTIAN LAVAL, THE NEW WAY OF THE WORLD: ON NEOLIBERAL SOCIETY 247–48 (Gregory Elliott trans., 2013) ("Reform of public administration is part of the globalization of forms of the art of governing. The same methods are advocated everywhere, whatever the local situation; a standard lexicon is employed (competition, process engineering, benchmarking, best practice, performance indicators.). These methods and categories are valid for all problems and all spheres of action. . . . This 'generic' reform of the state in conformity with private sector principles is presented as ideologically neutral. . . . In reality, it involves an extremely significant rationality that is all the more powerful for encountering few critiques and opponents."). *See also* Melissa Powers et al., *Quick Fixes or Real Remedies? The Benefits and Limitations of Climate and Energy Fast Policy*, 8 SAN DIEGO J. CLIMATE & ENERGY L. 67, 74 (2017) (discussing fast policy in the context of climate and energy policy and its implications for Oregon).

72. *See, e.g.,* Jody Freeman & Charles D. Kolstad, *Prescriptive Environmental Regulations Versus Market-Based Incentives*, *in* MOVING TO MARKETS IN ENVIRONMENTAL REGULATION: LESSONS FROM TWENTY YEARS OF EXPERIENCE 4 (2006) ("Over the past two decades, the superiority of market-based instruments has developed into a virtual orthodoxy.").

73. *See, e.g.,* Tom Tietenberg, *Cap-and-Trade: The Evolution of an Economic Idea*, 39 AGRIC. & RESOURCES ECON. REV. 359, 359 (2010) ("From its inauspicious beginning as an idea that was little more than an academic curiosity, emissions trading has matured into its current role as the centerpiece of the U.S. program to control acid rain and international programs to control greenhouse gases.").

"command-and-control" style of regulation that dominated the environmental laws enacted during the 1970s. While the main elements of this story have been recounted before, previous accounts have stopped short of probing the deeper conceptual shifts that underwrote these efforts and the broader implications for how we think about policy development and diffusion. As this Part shows, these debates drew upon and reinforced a novel and increasingly abstract conception of policy instruments that has constrained our thinking about pressing problems such as climate change and the possibilities for harnessing the full power of government to respond.

1. Origins Stories

Official histories often draw their strength from a powerful origins story, and few policy instruments have claimed as noble a pedigree as emission trading, starting with Ronald Coase's famous 1960 article, *The Problem of Social Cost*.[74] Although readers of Coase's article would be hard pressed to find even a subtle allusion to cap-and-trade or emissions trading in the text, the official history suggests that Coase's key insights regarding the reciprocal nature of harm and the trading of entitlements in settings of low transactions costs were the wellspring from which emissions trading grew.[75]

According to the standard history, Coase's insights were elaborated by Thomas D. Crocker in 1966, who suggested a

74. *See* Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

75. Not surprisingly, economists have been the main proponents of this view and have attributed the insight behind tradeable permits to Coase's 1960 article. *See, e.g.*, Tietenberg, *supra* note 73, at 359–60; A. Denny Ellerman, *A Note on Tradeable Permits*, 31 EUR. ASS'N ENV'T & RESOURCES ECONOMISTS 123, 123 (2005). But other scholars working in a more critical vein have also embraced it, even if they sometimes draw different conclusions from it. *See, e.g.*, Michel Callon, *Civilizing Markets: Carbon Trading Between in vitro and in vivo Experiments*, 34 ACCT. ORG.'S & SOC. 535, 538 (2009) ("The origins of the constitution of carbon markets lies in certain economists' theories on the externalities produced by markets. Coase's seminal work immediately comes to mind, as well as that of all the authors who have discussed and enriched his analyses, especially Dales (1968). Without this contribution from economic theory, carbon markets would have been literally unthinkable."). *See also* DONALD MACKENZIE, MATERIAL MARKETS: HOW ECONOMIC AGENTS ARE CONSTRUCTED 139–42 (2008) (describing the influence of Coase and Dales on the development of emissions markets); JANELLE KNOX-HAYES, THE CULTURES OF MARKETS: THE POLITICAL ECONOMY OF CLIMATE GOVERNANCE 11 (2016) ("The idea that market mechanisms utilizing well-defined property rights could be used to price and overcome the problem of negative externalities is an approach derived from theoretical work by Ronald Coase (1960).").

system of tradable emissions rights as a possible solution to air pollution problems, and by a Canadian economist, John Dales, whose 1968 book, *Pollution, Property & Prices,* offered the first formal proposal for a simple cap-and-trade program.[76] In Dales's view, the government could choose whatever level of pollution it wanted, allocate the appropriate quantity of pollution rights, and then allow trading to set the price.[77] Once in operation, "the market [would] automatically ensure[] that the required reduction in waste discharge will be achieved at the smallest possible total cost to society."[78] All of this would be accomplished, moreover, with "very little administrative expense by comparison with alternative schemes."[79]

The one thing missing in all of this, aside from any serious appreciation of politics and political economy, is Coase. In his book-length study, Dales only mentions Coase in his suggestions for further reading, characterizing *The Problem of Social Cost* as "eloquent on the relationship between law and economics."[80] Dales does cite Coase in a shorter article (also from 1968) summarizing his case for pollution rights, but only for the proposition that property rights do not reflect ownership of physical assets but rights to use them in certain ways.[81] For his

76. *See* Thomas D. Crocker, *The Structuring of Atmospheric Pollution Control Systems, in* THE ECONOMICS OF AIR POLLUTION: A SYMPOSIUM 81–85 (Harold Wolozin ed., 1966) (proposing a "market pricing system" for emissions rights); JOHN H. DALES, POLLUTION, PROPERTY, AND PRICES: AN ESSAY IN POLICY-MAKING AND ECONOMICS 93–97 (1968) (proposing a simple market in pollution rights); John H. Dales, *Land, Water, and Ownership*, 1 CAN. J. ECON. 791, 801 (1968). *See* Tietenberg, *supra* note 73, at 359–60 (recounting the standard history from Coase to Crocker and Dales); Nathaniel O. Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENV'T. L. REV. 313, 314 n.3 (1998) ("John Dales initially proposed a system of tradable permits to control pollution. . . . However, much of the literature can be traced back to Ronald Coase."); Ellerman, *supra* note 75, at 123 ("Barely forty years have passed since the basic idea underlying tradable permits was stated by Coase (1960), who noted the reciprocal nature of harmful effects and suggested that their regulation might be accomplished as effectively and efficiently by a market as by the more conventional forms of regulation. Another decade would elapse before this insight was elaborated and applied to environmental problems (Crocker 1966; Dales 1968; Montgomery 1972)."); KNOX-HAYES, *supra* note 75, at 11 (stating that early emissions trading programs, such as the Clean Air Act's Acid Rain Trading Program, were an application of "Coase's theory of externalities").

77. DALES, POLLUTION, PROPERTY, AND PRICES, *supra* note 76, at 107.

78. *Id.*

79. *Id*. at 108.

80. *Id*. at 111.

81. Dales, *Land, Water, and Ownership, supra* note 76, at 792 n.1, 795.

part, Crocker does not cite Coase at all, even though his framing of the problem is closer to the Coasean idea of reciprocal harm than Dales's analysis.[82]

In hindsight, there appears to be very little tangible connection between early thinking on tradable permits by Crocker and Dales and Coase's 1960 article.[83] As Steven Medema observes, "It is quite clear at least in retrospect, that the transferable permits system has little in common with the bilateral bargaining emphasized in 'The Problem of Social Cost'."[84] According to Medema, the effort to connect emissions trading back to Coase came later, mainly from economists who were deeply involved in promoting emissions trading.[85]

But by linking their ideas back to Coase, advocates of emissions trading bolstered their intellectual case, suggesting that the move to market-based approaches in environmental law

82. *See* Crocker, *supra* note 76, at 64.

83. *See, e.g.,* Steven G. Medema, *The Coase Theorem at Sixty*, 58 J. ECON. LIT. 1045, 1078 (2020) (observing that "though the Coase theorem was later to become associated with emissions trading, one searches in vain for an author suggesting during the 1970s that the theorem offered a remedy for large-scale environmental problems."); Steven G. Medema, *The Curious Treatment of the Coase Theorem in the Environmental Economics Literature, 1960-1979*, 8 REV. ENV'T ECON. & POL'Y 39, 43 (2014) [hereinafter *Curious Treatment*] ("Although today it is not uncommon to see Coase credited with the insight that gave rise to permit trading, the 1970s literature demonstrates no such tendency—instead crediting Crocker and Dales."). *See also* Wallace E. Oates & William J. Baumol, *The Instruments for Environmental Policy, in* ECONOMIC ANALYSIS OF ENVIRONMENTAL PROBLEMS 96–97 (Edwin S. Mills ed., 1975) ("[A] Coase solution is unlikely if the damaged parties constitute a large, diverse group for whom organization and bargaining is costly. A quick survey of our major environmental problems—air pollution in metropolitan areas, the emissions of many industries and municipalities into our waterways—indicates that these typically involve large numbers. This would suggest that the Coase solution is of limited relevance to the major issues of environmental policy.").

84. Medema, *Curious Treatment, supra* note 83, at 43; Medema, *The Coase Theorem at Sixty*, *supra* note 83, at 1098 (observing that pioneers of emissions trading such as Crocker, Dales, and Montgomery found their inspiration elsewhere). *See also* Edward Nik-Khah & Philip Mirowski, *On Going the Market One Better: Economic Market Design and the Contradictions of Building Markets for Public Purposes*, 48 ECON. & SOC. 268, 273 (2019) ("But those attuned to the distinctive features of market design economics will register the characterization of Coase's relationship to the enterprise as a false note. . . . [W]hen it came to the details of the market, Coase (and Dales) expressed very *little* interest."). In his classic 1964 book on water pollution, Allen Kneese does discuss Coase's negotiation solution in his discussion of "water resource and pollution allocation by private markets." *See* ALLEN KNEESE, THE ECONOMICS OF REGIONAL WATER QUALITY MANAGEMENT 38 (1964).

85. Medema, *Curious Treatment, supra* note 83, at 43. *See also* Tietenberg, *supra* note 73, at 359; Keohane et al., *supra* note 76, at 313.

was of a piece with the broader Coasean revolution in law.[86] In doing so, they effectively shifted attention to the role of property rights (as opposed to taxes or regulation) as the most promising way of dealing with pollution.[87] One of the most important consequences of this move was the emphasis on the severe knowledge problems confronting governments seeking to establish an optimal level of taxes or to enact prescriptive regulations.[88] By harnessing the forces of competition, markets could set prices at the "correct" level with governments playing a modest, enabling role.

Dales and Crocker embraced this view, emphasizing the superior information processing features of markets relative to governments. Because governments invariably "get it wrong" in their efforts to establish taxes equal to the social cost of an externality, it was far better to establish property rights and allow the market to set the price.[89] As Dales argued, "Once in operation, the Pollution Rights market will, by establishing a price for Rights, relieve the [government] of any necessity to *set* the proper price by trial-and-error methods."[90]

While these arguments do bear a family resemblance to Coase's critique of Pigovian taxes, there is a stronger echo here of Friedrich Hayek's conception of the price system as a superior information processor and the corresponding challenges facing governments seeking to intervene in the economy.[91] As Dales

86. Medema, *Curious Treatment, supra* note 83, at 51 ("The Coase theorem was very much in the air during the 1970s, discussed in department hallways and seminar rooms, as well as in the scholarly literature."). On the broader Coasean "revolution" in law, see BRUCE A. ACKERMAN, RECONSTRUCTING AMERICAN LAW 46–71 (1984).

87. *See* Medema, *Curious Treatment, supra* note 83, at 53 ("Perhaps the most significant contribution of Coase's negotiation analysis was to bring to the fore the role of property rights in externality situations").

88. This is a version of what Jodi Short characterizes as the "cognitively impaired state." *See* Jodi L. Short, *The Paranoid Style in Regulatory Reform*, 63 HASTINGS L.J. 633, 653–54 (2012).

89. *See, e.g.,* Tietenberg, *supra* note 73, at 360 ("In the marketable permit system the price would be established by the interaction of the demand for and supply of permits in the market."); William J. Baumol & Wallace E. Oates, *The Use of Standards and Prices for Protection of the Environment*, 73 SWED. J. ECON. 42, 44 (1971) (concluding that "we simply do not know how to set the required levels of taxes and subsidies").

90. DALES, POLLUTION, PROPERTY, AND PRICES, *supra* note 76, at 96.

91. *See, e.g.,* Dales, *Land, Water, and Ownership*, *supra* note 76, at 791 ("The administrative problem of approximating optimum shadow prices by actual user charges promises to be a nightmare."); *id.* at 792 (noting that "the great virtue of a pricing system is that it solves, avoids, mediates, or somehow manages to dispel, all sorts of complexities."). *See also* DALES, POLLUTION, PROPERTY, AND PRICES *supra* note 76, at

put it, "The virtues of the market mechanism are that no person, or agency, has to *set* the price—it is set by the competition among buyers and sellers of rights."[92] Similarly, in what reads like an almost direct quote from Hayek's famous 1945 essay, *The Use of Knowledge in Society*, Crocker observes,

> It is one of the advantages of a price system that in order for it to work efficiently, the only person who needs to know about how any given user will use the right he has purchased is the user himself. . . . The decisions that he and all other users of the air resource make with respect to the purchase of emission rights thus reveal to the control authority the real economic values of the air's two value dimensions.[93]

As Crocker concluded, "any control authority which does not take advantage of the market to provide information for the structuring of forthcoming authority decisions and the correction of past authority errors must have a serious misconception of its responsibilities to society."[94]

Aside from a strong preference for harnessing the price system, it is important to recognize the underlying conceptual

106–07 ("to draw up a list of regulations or subsidies that would reduce pollution by, say, 10 per cent *and do so in such a way as to minimize the cost of the operation*, is humanly impossible.") (emphasis in original).

92. Dales, *Land, Water, and Ownership*, *supra* note 76, at 801. *See id*., at 802 ("The automaticity of the market mechanism reduces administrative costs by relieving administrators of the necessity of setting the charge for rights and changing it periodically to reflect economic growth or decline.").

93. Crocker, *supra* note 76, at 81. *See also* Friedrich A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, 526 (1945) ("We must look at the price system as such a mechanism for communicating information if we want to understand its real function. . . . The most significant fact about this system is the economy of knowledge with which it operates, or how little the individual participants need to know in order to be able to take the right action.").

94. Crocker, *supra* note 76, at 84. *See id.* at 81 ("All in all, there is little doubt that the signaling potential of a price system has not yet been given its due in most atmospheric pollution problems."); Thomas D. Crocker, *On Air Pollution Control Instruments*, 5 LOY. L.A. L. REV. 280, 294 (1972) (characterizing emissions trading schemes as "informationally decentralized and . . . capable of dealing with large numbers of emitters and receptors at small cost since the agency would not have to specify the behavior patterns of individual emitters and receptors"). As we will see, this view of the superior information processing capacities of markets was also embraced by leading environmental lawyers during the 1980s, and used as the basis for their sustained critique of command-and-control regulation, which they sometimes characterized, in yet another echo of Hayek, as "Soviet-style central planning." *See infra* Part II.A.2.

move here. At the root of all of these early works in environmental economics was an increasingly abstract conception of discrete policy tools that could be compared and evaluated against each other.[95] As Dales put it, "[t]he market proposed in this paper is . . . nothing more than an administrative tool. But administrative tools that have some *prima facie* claim to efficiency should not be ignored in an increasingly administered society."[96] By isolating particular tools or instruments from their larger institutional contexts, such an approach prepared the ground for the comparative evaluation of different policy instruments that would soon become a mainstay of the environmental economics literature.[97]

During the early 1970s, economists such as Wallace Oates, David Baumol, and David Montgomery formalized and expanded upon these insights, giving rise to a large literature in economics on the theory of emissions trading, the relative merits of taxes versus tradeable permits, and the general superiority of market-based approaches compared to direct regulation via mandates and standards.[98] In all of this work, there was a progressive abstraction of the policy instrument idea, which in turn made formal comparisons of different instruments possible. Not surprisingly, much of this work focused on "policy tools operating through the pricing system,"[99] with a great deal of attention directed at what David Montgomery referred to as "artificial markets."[100] By reframing and narrowing the question of government action to a choice among different tools, the policy

95. *See* Dales, *Land, Water, and Ownership*, *supra* note 76, at 799–802 (discussing six different approaches to regulating water pollution).

96. *See id*. at 804.

97. *See, e.g.*, Robert W. Hahn, *Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders*, 3 J. ECON. PERSPS. 95, 96 (1989) ("In thinking about the design and implementation of policies, it is generally assumed that policy makers can choose from a variety of 'instruments' for achieving specified objectives.").

98. *See, e.g*, Baumol & Oates, *supra* note 89, at 47–50 (demonstrating the general properties of a pollution charge system); W. David Montgomery, *Markets in Licenses and Efficient Pollution Control Programs*, 5 J. ECON. THEORY 395 (1972) (demonstrating the existence of a cost-effective permit market equilibrium in the more complicated case where the location of emissions does affect environmental impact via separate permits for each receptor location).

99. *See* Oates & Baumol, *supra* note 83, at 95.

100. Montgomery, *supra* note 98, at 395.

instrument concept changed the way we think about problems and the capacities of government to respond.

Armed with this abstract conception of policy instruments, it was but a small step to the critique of existing regulation. What was implicit in the comparisons suggested by Crocker and Dales soon became a rallying cry for economists during the 1970s in their arguments that the drafters of major federal environmental laws such as the Clean Air Act and the Clean Water Act had essentially ignored economics in crafting their programs for pollution control.[101] One of the pioneers of this critique, Wallace Oates, has suggested that even though the economic perspective on pollution control was well developed in the academic literature by the 1960s and was discussed in the run-up to some of the early federal environmental legislation, environmentalists' hostility to price-based approaches made it impossible for such instruments to get traction.[102] According to Oates, this stemmed largely from widespread ignorance, as evidenced by a widely cited 1981 survey of the environmental policymaking community that "turned up virtually no one who could even explain the basic rationale for incentive-based policy measures[.]"[103]

101. *See, e.g.,* Wallace E. Oates, *Forty Years in an Emerging Field: Economics and Environmental Policy in Retrospect, in* THE RFF READER IN ENVIRONMENTAL AND RESOURCE POLICY 2ND ED. 301, 301 (Wallace Oates ed., 2006) ("Coming out of the environmental revolution of the 1960s, the early federal legislation—notably the Clean Air Act Amendments of 1970 and the Clean Water Act Amendments of 1972—essentially ignored economics.").

102. *Id*. at 302 ("Environmentalists were decidedly hostile. The market system was the reason we had pollution in the first place, they said. The idea of putting a price on pollution was morally repugnant.").

103. *Id*. at 303 (citing STEVEN KELMAN, WHAT PRICE INCENTIVES?: ECONOMISTS AND THE ENVIRONMENT (1981)). Even a cursory reading of Kelman's book, however, reveals that his analysis was focused far more on the many legitimate reasons why people might oppose pollution charges and other market-based approaches to environmental problems. STEVEN KELMAN, WHAT PRICE INCENTIVES?: ECONOMISTS AND THE ENVIRONMENT 9 (1981) ("The book is primarily aimed at people familiar with, and perhaps sympathetic to, microeconomic prescriptions for public policy. I hope to present them with arguments for why considerations beyond those typically included in microeconomic theory are important in making a decision about whether to use economic incentives in environmental policy, considerations that make the case for such an approach considerably less clear cut than it otherwise would be."). Although his surveys of Congressional staff did show a lack of familiarity with the "efficiency arguments" in favor of pollution charges (including among Republican staffers who generally supported such approaches), Kelman found that respondents' view on both sides of the question tended to reflect more general convictions regarding the relative role of markets versus government. *See id*. at 95–99. Moreover, contrary to Oates's claims, Kelman's surveys

This particular critique of American environmental regulation has now been repeated so many times that it has come to be accepted wisdom. As one retrospective assessment recently put it, "[s]tripped to its essentials, the U.S. approach to pollution control prior to the adoption of emissions trading . . . relied upon a *command-and-control* approach to controlling pollution."[104] The key phrase here, however, is not "command-and-control," but rather "stripped to its essentials." Indeed, whatever one thinks of the critique of command-and-control regulation, the underlying move to reduce policy instruments to their "essential features" was arguably more consequential. Gone was any recognition of the complexity and nuance of complicated programs, such as the National Ambient Air Quality Standards (NAAQS), with their multiple layers of authority, carefully crafted review processes, connections to other parts of the Act, and nested set of regulatory approaches.[105] Going forward, the main challenge confronting environmental regulation was reconceived as choosing among discreet instruments or tools depending on the problem at hand. As the difficulties and costs associated with existing regulation became apparent, moreover, "the political acceptability" of more "cost-effective" market-based tools grew.[106]

But early advocates of emissions trading confronted a basic problem; namely, the lack of any real-world experience with these new market-based approaches. While the theoretical case might be clear, policymakers wanted actual evidence that these new instruments would deliver in practice. Here, the role played by experimental economics in evaluating different policy

found that "[a]s a group, environmentalists were by far the most knowledgeable about charges—and also the most split." *Id.* at 107. Interestingly, Kelman also found in his survey of industry trade association staff that "[n]ext to Democratic Senate staffers, industry representatives were the most negative towards economic incentive proposals." *Id*. at 120. These industry respondents were also, "as a group, the least informed about charges proposals." *Id.* at 118. Thus, Oates seems to have misunderstood the basic motivation behind Kelman's book, several of the main results from Kelman's surveys, and the key takeaway that the seemingly technical debate over the relative merits of environmental policy instruments was (and is) actually a debate about values and different normative commitments regarding the role of government and markets in solving social problems.

104. Tietenberg, *supra* note 73, at 361.

105. For an overview of the NAAQS program, including its history and remarkable success over the years (despite ongoing challenges), see Boyd, *supra* note 69.

106. Tietenberg, *supra* note 73, at 361.

instruments proved decisive.[107] In a series of studies starting in the 1970s and continuing into the 1990s, economists used laboratory simulations to provide the "empirical" evidence demonstrating the relative merits of market-based approaches compared to command-and-control.[108] As Tom Tietenberg noted, this was a "pivotal point in the reform movement" given that these "empirical cost-effectiveness studies showed that it was possible to reach the predetermined standards at a *much* lower cost than was the case with the traditional command-and-control regime."[109]

Although framed as "empirical," these studies were not *ex post* evaluations of actually existing markets, but *ex ante* simulations in controlled settings.[110] As such, they often made use of limited

107. *See, e.g.,* Timothy N. Cason, *What Can Laboratory Experiments Teach Us About Emissions Permit Market Design?* 39 AGRIC. & RESOURCES ECON. REV. 151, 151 (2010) ("The principle of emissions trading is elegant and simple, but market performance can depend on many design factors. The devil is in the details. Fortunately, laboratory experiments can create *real,* simplified, and controlled markets to help answer important questions like these.").

108. For a list of major simulation studies between 1974 and 1999, *see* THOMAS H. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE 57–58 (2nd ed., 2006). *See also* David J. Bjornstad et al., *Understanding Experimental Economics and Policy Analysis in a Federal Agency: The Case of Marketable Emissions Trading*, *in* RESEARCH IN EXPERIMENTAL ECONOMICS: EMISSIONS PERMIT EXPERIMENTS 163, 169 (Mark Isaac & Charles Holt eds., 1999) ("In terms of mechanism testing, the experimental investigations began in 1983 when Charles Plott examined a tradeable emissions permit scheme in a more general study of policy mechanisms to deal with externalities."); Cason, *supra* note 107, at 154 ("*[E]xperimental models* are . . . useful for providing insight into complex new design problems such as those faced by regulators implementing emissions trading systems. The idea is to create experimental designs to capture key aspects of the real-world market, and then vary features of the market to investigate how this affects outcomes.").

109. Tietenberg, *supra* note 73, at 361. *See id*. ("This rather consistent finding, produced for a number of different pollutants and geographic settings, offered the politically attractive prospect of either achieving the existing environmental objectives at a much lower cost or of obtaining a much higher level of environmental quality for the same expenditure. While theory showed that command-and-control regulation typically was not cost-effective, empirical work demonstrated that the degree of inefficiency was very large indeed.").

110. *See, e.g.*, Bjornstad et al., *supra* note 108, at 165 ("Experimental economics, by offering the ability to generate data from hypothetical markets that would be created by the proposed rules, presents the opportunity to develop some evidence for validating the proposed market rules. While the approach cannot deliver 'proof of principle' it can clearly highlight problems and can focus attention on potential areas of contention."); Charles R. Plott, *Experimental Methods in Political Economy: A Tool for Regulatory Research*, *in* ATTACKING REGULATORY PROBLEMS: AN AGENDA FOR RESEARCH IN THE 1980S 118, 118–19 (Allen R. Ferguson ed., 1981) (discussing role of laboratory experiments in economics in developing a "solid empirical basis for theory").

numbers of subjects (very often students) and relied on a set of strategic simplifications and assumptions that allowed them to test particular design features and investigate various outcomes.[111] The messiness of politics and real-world institutions were left to the side. Deeper philosophical questions regarding what kind of evidence they constituted were almost never confronted.[112] And, perhaps not surprisingly, market-based approaches almost always came out on top in any side-by-side comparisons with more prescriptive approaches.[113]

In addition to bolstering the case for emissions trading, these studies had two important effects. First, they reinforced the emerging conception of environmental regulation as a choice among different policy instruments. In doing so, they worked to further separate those instruments from their institutional and political contexts to make them amenable to comparative evaluation. Second, they marked an important step by economists and the economics profession toward a more interventionist engagement with environmental policy.[114] Markets were no longer simply objects of study, but rather tools that could be designed and deployed to achieve certain outcomes.[115] As the fields of mechanism design and

111. *See, e.g.*, Cason, *supra* note 107, at 159 ("Most emissions trading experiments employ student subjects and a neutral, non-environmental context").

112. *See* Mary S. Morgan, *Simulation: The Birth of a Technology to Create "Evidence" in Economics*, 57 REV. HIST. SCI. 341, 368 (2004) (tracing use of computer simulations in economics starting in the early 1960s as part of a broader embrace of computer simulations and new "artificial" experiments across the sciences directed at creating evidence). Although the use of computer simulations and other forms of experiments in economics had become an accepted "style of reasoning" by the 1980s, Morgan concludes that important epistemological questions remain regarding the status of the "evidence" created by these new techniques. *See id.* at 369.

113. *See* Tietenberg, *supra* note 73, at 365 ("The vast majority, though not all, of the large number of *ex ante* studies have found command-and-control outcomes to be significantly more costly than the least-cost alternative.").

114. This can be seen as one instance of the broader influence of economists in American public policy starting the late 1960s. *See* BINYAMIN APPELBAUM, THE ECONOMISTS' HOUR: FALSE PROPHETS, FREE MARKETS, AND THE FRACTURE OF SOCIETY 5 (2019) ("In the four decades between 1969 and 2008, . . . economists played a leading role in curbing taxation and public spending, deregulating large sectors of the economy, and clearing the way for globalization.").

115. *See* Edward Nik-Khah & Philip Mirowski, *On Going the Market One Better: Economic Market Design and the Contradictions of Building Markets for Public Purposes*, 48 ECON. & SOC. 268, 281 (2019) ("Newly developed methods of conducting computerized laboratory experiments meant that market designers could 'test' a newfangled market's performance prior to implementing it").

experimental economics gained in popularity and importance, this kind of "institutional engineering" was applied across multiple domains.[116]

Looking back, the intellectual history of emissions trading is more complicated and *ad hoc* than the standard account suggests. But the simple story that advocates constructed starting in the 1970s has demonstrated remarkable staying power and influence, serving to legitimate the new market-based approaches and diminish the prospects of alternatives. The most consequential move in all of this, as suggested, was the isolation and progressive abstraction of the policy instrument idea. By separating policy instruments from their political and institutional contexts, the economic approach left us with a diminished view of government and a limited set of resources to call upon in response to complex and far-reaching problems such as climate change.

2. Reforming Environmental Law

Lawyers got into the mix in the mid-1980s, embracing the economic critique of "command-and-control" regulation and developing their own institutional arguments in favor of cap-and-trade. Prominent legal scholars, such as Bruce Ackerman, Richard Stewart, and Cass Sunstein, argued that the new market-based approaches would be far superior to the technology-based standards that dominated the first generation of environmental law.[117] In their view, these new market-based approaches promised to reform environmental law—to awaken the field from its dogmatic slumbers, shake loose the last vestiges of "Soviet-style central planning," and usher in a new era of environmental pollution control that would be cheaper and more democratic.[118]

116. *See id.* at 280 (discussing Plott's conception of policy analysis as a type of "institutional engineering" with a focus on creating "new" or "synthetic" institutions – and noting the importance of experimental evidence to support these new "synthetic institutions" which heretofore had no track record or practical experience). *See also* Vernon L. Smith, *Economics in the Laboratory*, 8 J. ECON. PERSPS. 113, 115 (1994).

117. *See, e.g.*, Ackerman & Stewart, *Reforming Environmental Law*, *supra* note 24, at 1333 ("The present regulatory system wastes tens of billions of dollars every year, misdirects resources, stifles innovation and spawns massive and often counterproductive litigation").

118. *See id.* at 1334 ("The current system does not in fact 'work' and its malfunctions, like those of Soviet-style central planning, will become progressively more serious as the economy grows and

Characterizing the then-existing approach to pollution control as "extraordinarily crude, costly, litigious, and counterproductive," Ackerman and Stewart provided a bill of particulars that added up to a devastating indictment.[119] Billions of dollars had already been wasted as a result of failure to recognize vast differences across firms (and installations) in the marginal cost of pollution abatement.[120] New products and processes were penalized rather than rewarded.[121] Incentives for the development of new environmentally superior strategies did not exist.[122] Centralized determination of complex scientific, engineering, and economic issues regarding feasibility controls on "hundreds of thousands of pollution sources" was all but impossible.[123] And the entire approach was "inconsistent with intelligent priority setting."[124] "This indictment," they concluded, "is not idle speculation, but the product of years of patient study by lawyers, economists, and political scientists."[125]

In advancing their critique, Ackerman and Stewart suggested a divide between first- and second-generation approaches to environmental law—a framing that worked to further reinforce an implicit narrative of progress and improvement in our tools for reducing pollution.[126] While they admitted that "the embrace

changes and our knowledge of environmental problems develops."). Stewart repeated this characterization in several subsequent articles. *See, e.g.*, Richard B. Stewart, *Controlling Environmental Risks through Economic Incentives*, *supra* note 24 at 154 ("Our current environmental regulatory system . . . has grown to the point where it amounts to nothing less than a massive effort at Soviet-style central planning of the economy to achieve environmental goals."); Richard B. Stewart, *Models for Environmental Regulation: Central Planning Versus Market-Based Approaches*, 19 B.C. ENV'T. AFF. L. REV. 547, 547 (1992) ("The United States, despite its market-based economy, has relied heavily on central planning-style, 'command-and-control' tools to achieve its environmental protection goals."); Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U.L. REV. 21, 30-31 (2001) ("Command environmental regulation is a form of central economic planning that shares the inherent inefficiencies of all such systems."). *See also* Sunstein, *supra* note 26, at 412 ("Ironically, a large source of regulatory failure in the United States is the use of Soviet-style command and control regulation, which dictates, at the national level, technologies and control strategies for hundreds, thousand, or millions of companies and individuals in a nation that is exceptionally diverse in terms of geography, costs and benefits of regulatory controls, attitudes, and mores.").

119. Ackerman & Stewart, *Reforming Environmental Law*, *supra* note 24, at 1333.

120. *Id*. at 1335.

121. *Id*. at 1335–36.

122. *Id*. at 1336.

123. *Id.*

124. *Id*. at 1337.

125. *Id*.

126. This can be seen as part of the larger approach or style of "minimalism" in public administration that Charles Sabel and William Simon identify as one of two main alternatives to the command-and-control style of administration that characterized

of a BAT [Best Available Technology] approach made some sense as a crude first-generation strategy,"[127] they chastised their contemporaries for living in the past. "Our complaint is not with the statutory draftsmen of the early 1970s," they observed, "but with lawyers of the 1980s who fail to put these statutes in historical perspective."[128]

In a reprise of earlier arguments by economists, Ackerman and Stewart also emphasized the superior role of markets in solving the knowledge and coordination problems posed by environmental pollution control. "Instead of giving the job of economic and technological assessment to bureaucrats," they argued, "the marketable rights mechanism would put the information-processing burden precisely where it belongs: upon business managers and engineers who are in the best position to figure out how to cut back on their plants' pollution costs."[129] In sum, a tradeable permits approach

> not only promises to save Americans many billions of dollars a year, to reward innovative improvements in existing clean-up techniques, and to eliminate the BAT system's penalty on new, productive investment. It also offers formidable administrative advantages. It relieves agencies of the enormous information-processing burdens that overwhelm them under the BAT system; it greatly reduces litigation and delay; it offers a rich source

American public law from the New Deal to the 1980s. *See* Sabel & Simon, *supra* note 27, at 54. According to Sabel and Simon, the minimalism model "seeks to ground policy design in economic concepts and market practices, and to minimize frontline administrative discretion and popular participation in administration. Its key normative reference points are efficiency and consistency." *Id.* at 54–55. Cost-benefit analysis, behavioral nudges, and cap-and-trade are among the regulatory tools favored by minimalists. *Id.* at 55, 64.

127. Ackerman & Stewart, *Reforming Environmental Law*, *supra* note 24, at 1364. Best available technology is used as a proxy here for the prescriptive technology and performance standards used in pollution control statutes such as the Clean Air Act and the Clean Water Act.

128. *Id.*

129. *Id.* at 1343. *See also* Stewart, *A New Generation of Environmental Regulation*, *supra* note 118, at 31 ("[A] command system of air pollution regulation requires detailed specifications of behavior for hundreds of thousands of various industrial and commercial sources of air pollution, as well as controls on tens of millions of motor vehicles. Central planners are unable to gather and process the information needed to write directives that respond appropriately to the diverse and changing circumstances of so many actors in a vast nation with a dynamic economy.").

> of budgetary revenue in a period of general budgetary stringency; and it forces agencies to give new importance to the critical business of enforcing the law in a way that America's polluters will take seriously.[130]

To those who felt that it all sounded too good to be true, Ackerman and Stewart responded in a subsequent article that "there *is* such a thing as a free lunch. A reform relying on market incentives is just plain better, in terms of all relevant public values, than the status quo."[131]

Chief among these public values, Ackerman and Stewart argued, was more democratic deliberation over the goals of pollution control.[132] Rather than focusing debate on "arcane technological questions," as the BAT system did, a marketable permit system would allow citizens and policymakers to focus on the ends of environmental regulation.[133] Cass Sunstein reinforced these arguments several years later with his own vigorous defense of market-based approaches.[134] Emissions trading systems, he argued, "offer the great advantage of putting the power of deciding pollution levels back into the hands of the citizenry, rather than focusing on the often unintelligible question of what control technology is 'best' or 'available'."[135] Simply put, the public would decide on ends—the socially optimal level of pollution control—while the precise choice of

130. Ackerman & Stewart, *Reforming Environmental Law*, *supra* note 24, at 1346.

131. *See* Ackerman & Stewart, *The Democratic Case for Market Incentives*, *supra* note 24, at 172.

132. *See id.* at 171 ("The creative use of market incentives will not only save billions of dollars each year, vastly improve administrative efficiency, and even help balance the budget. It will also vastly improve the quality of the democratic debate about values, allowing a wider public to address basic issues that the present regulatory system obscures under a flood of technocratic mumbo-jumbo."). *See also* Richard B. Stewart, *Administrative Law in the Twenty-First Century*, 78 N.Y.U. L. REV. 437, 453 (2003) ("By greatly reducing the decisions that governments must make, economic incentive systems may promote political accountability.").

133. Ackerman & Stewart, *The Democratic Case for Market Incentives*, *supra* note 24, at 189.

134. *See* Cass R. Sunstein, *Administrative Substance*, 1991 DUKE L.J. 607, 633 (1991) (arguing for a "strong presumption in favor of flexible, market-oriented, incentive-based regulatory strategies" which would "make it more likely that regulation will increase efficiency, promote its own purposes, and—by focusing public attention on the right questions—further democratic goals as well").

135. *Id.* at 636. For a defense of BAT coupled with a direct critique of Sunstein's arguments in favor of market-based approaches, *see* Shapiro & McGarity, *supra* note 26, at 744–51.

means would be left to the market. As with Ackerman and Stewart, Sunstein had very little to say about the actual practice of designing these markets or the challenges of implementation. Given the intense rent seeking directed at cap-and-trade design (and market design in other domains), this lack of attention to the politics associated with the many details involved in designing and implementing these programs seems short-sighted.[136]

While the environmental law community did not exactly race to defend command-and-control, several scholars did push back. Howard Latin argued that the real-world application of technology-based standards was more effective than critics suggested and that false comparisons between an idealized version of emissions trading and real-world application of command-and-control would never go in favor of the latter.[137] Tom McGarity and Sydney Shapiro likewise offered a careful response to the parade of horribles that critics of the BAT approach put forth, showing how the claim that BAT approaches were "wildly inefficient" was itself wildly overstated.[138] And ten years after Ackerman and Stewart's initial article, Lisa

136. On rent seeking in the context of market design, *see* Marc K. Landy & Martin Levin, *Creating Competitive Markets: The Politics of Market Design*, *in* CREATING COMPETITIVE MARKETS: THE POLITICS OF REGULATORY REFORM 9–12 (Marc K. Landy et al. eds., 2007) (noting the intense politics and rent seeking directed at various market design processes). *See also* DONALD MACKENZIE, MATERIAL MARKETS: HOW ECONOMIC AGENTS ARE CONSTRUCTED 33 (2009) ("That the design of markets—for example, the formal and informal rules that govern them—is a political matter is true more widely. Apparently minor matters—'technicalities,' often technicalities little understood by non-participants—can have big effects, giving advantages to some actors and some strategies and disadvantaging others. . . . An effective politics of markets—whether 'left-wing or 'right-wing' in inspiration—needs to engage with such apparent technicalities,' not just with the overall virtues and demerits of markets.").

137. *See* Howard Latin, *Ideal versus Real Regulatory Efficiency; Implementation of Regulatory Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN. L. REV. 1267 (1985) (defending the record of technology-based controls against the proponents of market-based approaches).

138. *See* Shapiro & McGarity, *supra* note 135, at 747–49 (responding point-by-point to Sunstein's claims that BAT strategies are inferior to market-based approaches). *See also* Wagner, *supra* note 26, at 84–85 (observing that while technology-based standards are not "a particularly admired approach to pollution control" they have proved to be "one of the most reliable methods for controlling pollution"); Steinzor, *supra* note 26, at 202 ("The journey from traditional command and control to a more flexible system of industry self-regulation poses dangers for the environment and for the EPA as an institution. Cheaper, faster and smarter alternatives will elude us as long as the short-term political expediency of placating the most vociferous critics overshadows the tedious, expensive effort to reach a better-informed middle ground.").

Heinzerling used the experience of the Clean Air Act's sulfur dioxide (SO_2) trading program to advance a highly critical assessment of their arguments regarding the democratic benefits of emissions trading.[139] Based on a detailed study of the legislative debate over the SO_2 trading program (also known as the acid rain trading program), Heinzerling showed that Congress paid almost no attention to the actual pollution level set by the 1990 amendments, and instead focused largely on the allocation of allowances. In her view, the evidence was clear that the democratic benefits of pollution trading did not materialize. "Review of the history of the 1990 Amendments reveals that reasoned deliberation did not occur," she concluded.[140] In stark contrast to suggestions that market-based approaches would see less interest group maneuvering, Heinzerling also documented how specific design decisions were driven by special interests.[141] As she concluded, it was "naïve to suppose that a costly piece of legislation like the 1990 Amendments to the Clean Air Act would be unattended by political deals."[142]

And yet, notwithstanding the criticisms advanced by Heinzerling and others, the interventions by Ackerman, Stewart, and Sunstein marked a major shift in environmental law scholarship.[143] Going forward, debates over instrument choice dominated the literature ("the ceaseless sport of environmental law" as Jonathan Wiener put it[144]) and a rough consensus in favor of market-based approaches took hold across much of the legal academy.[145] To be sure, this new focus generated important insights and facilitated a more sophisticated understanding of the tradeoffs involved in environmental regulation. As with cost-benefit analysis, the instrument choice debate brought environmental law into a

139. *See* Heinzerling, *supra* note 26.

140. *Id.* at 323.

141. *Id.* at 303 ("Congress appears to have paid scarcely any attention to the pollution level set by the 1990 Amendments and to have concentrated instead on satisfying powerful interest groups through its allocation of permits."); *id.* at 328–32 (documenting examples of interest group influence over multiple allowance allocation decisions).

142. *Id*. at 332.

143. *See* Freeman & Kolstad, *supra* note 72. *See also* Heinzerling, *supra* note 26, at 301 ("Perhaps because of its perceived promise as a bridge between efficiency and democracy, establishing markets for trading pollution permits—'pollution trading'—may be the most fashionable innovation in environmental policy today.").

144. Wiener, *supra* note14, at 679.

145. *Id*. at 682.

more vigorous and productive engagement with economics. But it also diminished and narrowed the possibilities that might have come with alternative commitments and framings.[146] Looking back, some of the criticisms of existing "first-generation" environmental law also seem excessive. The characterization of BAT as "Soviet-style central planning," in particular, looks more like a cheap shot intended for rhetorical effect than a substantive criticism. That it was leveled (and repeated) by some of the most prominent legal scholars in the field stands as a troubling reminder of the deeper ideological struggles that have shaped environmental law for decades.

3. Instrument Choice & Optimality

As scholars in environmental economics and law debated the relative merits of emissions trading versus technology-based approaches, they drew upon and reinforced new ways of thinking about law and policy that had been underway since the middle of the twentieth century. Across multiple disciplines, attention shifted during this time to the tools and techniques of government, often framed within a broader set of questions regarding institutional competence and decision making.[147] While some of this reflected a broad-based effort to grapple with the overall growth of government and regulation—an obvious marker of which was the emergence of a self-defined field of "policy science" in the 1950s[148]—much of it drew upon internal developments within the disciplines themselves.

146. *See* KYSAR, *supra* note 23, at 2–3 (discussing ways in which economic reasoning has displaced earlier moral and political commitments of environmental law).

147. There is of course a long tradition of thinking about the various tools that governments use. *See, e.g.,* Christopher Hood, *Intellectual Obsolescence and Intellectual Makeovers: Reflections on the Tools of Government After Two Decades*, 20 GOVERNANCE 127, 128 (2007) ("In one sense, there is nothing new about attempts to analyze the instruments used by governments for public policy. After all, debating alternative possible ways of keeping public order, enforcing laws, or collecting revenue is a classic concern of political thought.").

148. The first formal effort to define the "policy sciences" as a field of study is often attributed to Harold Laswell of Yale Law School. As Laswell himself described the field, "[t]he policy sciences study the process of deciding or choosing and evaluate the relevance of available knowledge for the solution of particular problems." *See* Harold D. Laswell, *Policy Sciences*, *in* INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 181 (David L. Sills & Robert K. Merton eds., 1969). The first published use of the term is typically dated to a 1951 edited collection by Harold Laswell and Daniel Lerner. *See* THE POLICY SCIENCES: RECENT DEVELOPMENT IN SCOPE AND METHOD (David Lerner & Harold Laswell eds., 1951). *See also* James Farr et al., *The Policy Scientist of Democracy: The*

In the fields of political science and public administration, attention to the techniques of government emerged as a central concern during the decades after World War II.[149] Although much of this was framed against the backdrop of general Cold War debates over the relative merits of planning versus markets, there was a strong interest in moving beyond the clash of grand paradigms to a more granular evaluation of the pros and cons of different types of policies and tools.[150] Efforts were made to identify and classify different kinds of policy interventions into functional categories.[151] And there was a recognition that different types of policies carried within them and even created their own politics.[152] Growing interest in policy

Discipline of Harold D. Laswell, 100 AM. POL. SCI. REV. 579, 580 (2006) (observing that both the phrase and the vision of the "policy sciences" emerged in Laswell's unpublished writings of the early 1940s). For a broader historical treatment of the "sciences of policy" in Britain and the United States that traces the field's origins to operations research during the Second World War, see WILLIAM THOMAS, RATIONAL ACTION: THE SCIENCES OF POLICY IN BRITAIN AND AMERICA, 1940–1960 (2015). *See also* Laurence H. Tribe, *Policy Science: Analysis or Ideology?* 2 PHIL. & PUB. AFFS. 66, 68 (1972) ("When the policy sciences came to be applied to the problems of government on a large scale in the 1960s, first in the Defense Department and then throughout the federal government, they would be characterized by a fundamentally economic approach to problems—and approach that retained much of the quantitative emphasis and mathematical rigor of operations research but which structured situations in terms of the traditional economic model of social reality.").

149. The explicit conception of policy instruments as objects of research in political science is generally traced to work by Robert Dahl and Charles Lindbolm in the early 1950s on the political economic techniques employed by the modern state. *See* ROBERT A. DAHL & CHARLES E. LINDBOLM, POLITICS, ECONOMICS, AND WELFARE 6 (1953) ("In economic life, the possibilities for rational social action, for planning, for reform—in short, for solving problems—depend not upon our choice among mythical grand alternatives but largely upon choice among particular techniques."). *See also* Stephen H. Linder & B. Guy Peters, *The Study of Policy Instruments: Four Schools of Thought*, *in* PUBLIC POLICY INSTRUMENTS: EVALUATING THE TOOLS OF PUBLIC ADMINISTRATION 34 (B. Guy Peters & Frans K.M. Van Nispen eds., 1998) ("The groundwork for instrument study in political science was fashioned by Dahl and Lindbolm in the early 1950s in a monograph on the politico-economic techniques employed by the modern state.").

150. *See* Dahl & Lindbolm, *supra* note 149, at 9 ("The alternative techniques available for a particular problem commonly offer a high degree of selectivity. They permit more precision in choice, more careful adaptation of means to ends, than men sometimes take account of.").

151. *See, e.g.,* Theodore J. Lowi, *American Business, Public Policy, Case-Studies, and Political Theory*, 16 WORLD POL. 677, 689 (1964) ("The approach I have taken is to define policies in terms of their impact or expected impact on society. When policies are defined this way, there are only a limited number of types; when all is said and done, there are only a limited number of functions that governments can perform. . . . My approach replaces the descriptive, subject matter categories of the pluralists with functional categories.").

152. *See, e.g.,* Theodore J. Lowi, *Four Systems of Policy, Politics, and Choice*, 32 PUB. ADMIN. REV. 298, 299 (1972) ("The perspective of the entire approach is the very opposite

implementation during the late 1960s and 1970s also worked to reinforce an emphasis on tools and techniques.[153] By the early 1980s, scholars working in public management and public administration argued for an explicit focus on policy tools and instruments to replace more traditional concerns with agencies and programs.[154]

In law, as legal realism gave way to legal process during the middle decades of the twentieth century, leading scholars put the question of institutional competence front and center, asking which institution of government and, by extension, what type of government action was best suited to deal with a particular problem.[155] While legal process scholars did not focus on specific

of the typical perspective in political science, for it begins with the assumption that *policies determine politics*.").

153. *See, e.g.*, JEFFREY L. PRESSMAN & AARON WILDAVSKY, IMPLEMENTATION xxi (3rd ed., 1984 [1973]) ("Implementation in recent years has been much discussed but rarely studied. Presidents and their advisors, department secretaries and their subordinates, local officials and groups in their communities complain that good ideas are dissipated in the process of execution.").

154. *See, e.g.,* Lester M. Salamon, *Rethinking Public Management: Third-party Government and the Changing Forms of Government Action,* 29 PUB. POL'Y 255, 256 (1981) ("[R]ather than focusing on individual programs, as is now done, or even collections of programs grouped according to major 'purpose,' as is frequently proposed, the suggestion here is that we should concentrate instead on the generic tools of government action, on the 'techniques' of social intervention that come to be used, in varying combinations, in particular public programs."); CHRISTOPHER C. HOOD, THE TOOLS OF GOVERNMENT 2 (1983) ("We can imagine government as a set of administrative tools. . . . What government does to us—its subjects or citizens—is to try to shape our lives by applying a set of administrative tools in many different combinations and contexts, to suit a variety of purposes."); Lorraine M. McDonnell & Richard F. Elmore, *Getting the Job Done: Alternative Policy Instruments,* 9 EDUC. EVAL. & POL'Y ANAL. 133, 133 (1987) (arguing for a third generation of policy implementation studies "focusing on the instruments common to different policies and on the conditions under which these instruments are most likely to produce their intended results"); Stephen H. Linder & B. Guy Peters, *Instruments of Government: Perceptions and Contexts*, 9 J. PUB POL'Y 35, 36 (1989) (reviewing research focused on policy instruments and arguing for more attention to the subjective and contextual factors affecting choice of instrument).

155. *See, e.g.,* HENRY HART, JR. & ALBERT M. SACKS, THE LEGAL PROCESS: BASIC PROBLEMS IN THE MAKING AND APPLICATION OF LAW 4 (William Eskridge & Phillip Frickey eds., 1995). *See also* Gary Peller, *Neutral Principles in the 1950s*, 21 U. MICH. J.L. REFORM 561, 594 (1988) ("The process-theorists believed there could be a kind of neutral, functional correlation between different kinds of disputes and different kinds of institutions, so that the categories of disputes could be matched up with the kinds of institutional procedures corresponding to them."); Guido Calabresi, *An Introduction to Legal Thought: Four Approaches to Law and to the Allocation of Body Parts*, 55 STAN. L. REV. 2113, 2123 (2003) (describing comparative institutional analysis of legal process approach as an approach that "could examine courts, legislatures, administrative agencies, executives, juries, etc., and shed light on the particular attributes of each of these that would make a given institution especially suited to decide some issues rather

regulatory instruments, their highly functionalist approach and commitment to neutral principles provided fertile ground for the more detailed, technocratic approaches to law and policy that emerged in the 1970s and 1980s.[156] From here, it was only a small step to the comparative evaluation of different policy instruments in regulatory intensive fields such as environmental law.

In economics, a resurgence of interest in A.C. Pigou's conception of externalities elevated the question of instrument choice during the 1960s.[157] A decade later, this question had come to preoccupy the emerging field of environmental economics.[158] And by the 1990s, under the influence of

than others. In effect, this approach would help select who should be the definers and determiners of the values that would guide the legal system. It would do so, neutrally, based on institutional capacity.").

156. *See* Peller, *supra* note 155, at 571–72 (1988) ("The premises of process theory became the background assumptions for a whole generation of scholars who believed the basic message that it was possible to talk about legal issues in neutral, apolitical ways, and that ideology was outside the realm of their legal discourse."). *See also* Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability*, 85 HARV. L. REV. 1089, 1092–93 (1972) (offering a framework for comparing and evaluating the effects of property, liability, and inalienability rules in protecting particular entitlements granted by the state); NEIL K. KOMESAR, IMPERFECT ALTERNATIVES: CHOOSING INSTITUTIONS IN LAW, ECONOMICS, AND PUBLIC POLICY (1994) (bringing insights from law and economics into the comparative analysis of institutions as part of an effort to establish a new legal process theory).

157. *See* Steven G. Medema, *"Exceptional and Unimportant?" Externalities, Competitive Equilibrium, and the Myth of a Pigovian Tradition*, 52 HIST. POL. ECON. 135, 160–64 (2020) (discussing surge of interest in Pigou's concept of externalities in 1960s in applied sub-fields such as environmental and natural resource economics and increased attention to range of different policy instruments to address externalities). Coase played a central role in establishing comparative institutional analysis as the basic approach. *See* Coase, *supra* note 74, at 18 (observing that in a world of positive transactions costs "the problem is one of choosing the appropriate social arrangement for dealing with the harmful effects. All solutions have costs and there is no reason to assume that government regulation is called for simply because the problem is not well handled by the market or the firm. Satisfactory views on policy can only come from a patient study of how, in practice, the market, firms, and governments handle the problem of harmful effects."). *See also* Medema, *Coase Theorem at Sixty*, *supra* note 83, at 1051 (noting that one of the main points of *The Problem of Social Cost* was the recognition that "in the real world of positive transactions costs, all coordination mechanisms—markets, firms, and government—are costly and imperfect . . . . Comparative institutional analysis, then, becomes the method of choice, and the goal, from an economic perspective, is to select the coordination mechanism that maximizes the value of output for the problem under consideration.").

158. *See, e.g.*, Oates & Baumol, *supra* note 83, at 97 (providing a taxonomy of environmental policy instruments, including price incentives, direct controls, voluntary compliance, and public production); WILLIAM J. BAUMOL & WALLACE E. OATES, THE THEORY OF ENVIRONMENTAL POLICY (2nd ed., 1988) (discussing theory of externalities

experimental economics and mechanism design, economists were developing novel laboratory simulations to test the relative efficiency of different policy instruments.[159]

As research agendas shifted toward the investigation of policy tools and techniques, there was a heightened emphasis on more formal methods and approaches.[160] By redirecting attention to the study of "generic" policy instruments, this new approach worked to separate the task of policy formulation from implementation and, in the process, to disembed policy tools or instruments from their broader political and institutional contexts.[161]

At the core of this new thinking, as already suggested, was an increasingly abstract conception of policy instruments that was highly functionalist and typically framed in neutral terms.[162] Although the different disciplines varied in their normative commitments, there was a strong undercurrent of optimization animating much of this work along with a corresponding diminishment of politics.[163] Policy instruments were often viewed as substitutes, and the choice of instrument was typically

and policy instrument choice and design); David Pearce, *The Intellectual History of Environmental Economics*, 27 ANN. REV. ENERGY ENV'T 57, 72–75 (2002) (discussing early work on policy instruments in environmental economics).

159. *See* Part II.A, *supra*.

160. *See, e.g.,* Lester M. Salamon, *Rethinking Public Management: Third Party Government and the Changing Forms of Government Action*, 29 PUB. POL'Y 255, 256 (1981) ("The major shortcoming of current implementation research is that it focuses on the wrong unit of analysis. . . . [T]he suggestion here is that we should concentrate instead on the generic tools of government, on the 'techniques' of social intervention.").

161. *Id. See also* Michael Howlett, *From the 'Old' to the 'New' Policy Design: Design Thinking Beyond Markets and Collaborative Governance*, 47 POL. SCI. 187, 191 (2014) (discussing this move as a turn to "theory building, focusing on topics such as the need to more precisely categorize types of policy instruments in order to better analyze the reasons for, and patterns of, their use").

162. *See, e.g.*, Janine R. Wedel, et al., *Toward an Anthropology of Public Policy*, 600 ANN. AM. ACAD. POL. SOC. SCI. 30, 37 (2005) ("Typically, 'policy' is represented as something that is both neutral and rational: a mere tool that serves to unite means and ends or bridge the gap between the goals and their execution—in short, a legal-rational way of getting things done."); Pierre Lascoumes & Patrick Le Gales, *Introduction: Understanding Public Policy Through its Instruments—From the Nature of Instruments to the Sociology of Public Policy Instrumentation*, 20 GOVERNANCE 1, 8 (2007) (observing that "the issue of selecting public policy instruments and their mode of operation is generally presented in a functionalist manner, as a matter of simple technical choices").

163. *See, e.g.,* Howlett, *supra* note 161, at 193 ("Policy design elevates the analysis and practice of policy instrument choice—specifically tools for policy implementation—to a central focus of study, making their understanding and analysis a key design concern.").

seen as a predominantly technical exercise best performed by experts.[164]

Much of this work was structured around a linear assembly-line model of policy development divided into a sequence of discreet stages: design, adoption, implementation, and diffusion.[165] By reconceiving the task of regulation (and government more broadly) as a selection of particular instruments from a standard toolbox, there was a strong presumption that the right tool could be found to address the problem at hand.[166] This reinforced a general, common sense notion that good policy instruments tended to rise to the top, prove their worth, and then diffuse from their initial sites of experimentation to sites of emulation.[167] As these policies traveled, it was further assumed, they remained relatively intact—conceived as a bundle of design features that in the right hands could be tweaked and optimized depending on the needs of a particular jurisdiction.[168]

In fact, explicit attention to how policies traveled (what came to be known as policy diffusion studies) had been underway since the late 1960s, emerging out of research on American federalism

164. *See, e.g.,* Michael Howlett & M. Ramesh, *Patterns of Policy Instrument Choice: Policy Styles, Policy Learning and the Privatization Experience*, 12 POL. STUD. REV. 3, 4 (1993) (observing that in welfare economists' investigation of policy instruments "the choice of instrument is usually treated as a strictly technical exercise, one which consists of evaluating the features of various instruments, matching them to different types of market failures, estimating their relative costs, and choosing that instrument which most efficiently overcomes the market failure in question"). *See also* Kelman, *supra* note 103, at 154 (concluding that "the microeconomic agenda [of policy analysis] is one in which public policy making is denuded of some of the most important features of politics—politics in the best sense of the battle over what kind of society we are going to create").

165. *See* Michael Howlett, *Policy Instruments, Policy Styles, and Policy Implementation: National Approaches to Theories of Instrument Choice*, 19 POL. STUD. J. 1, 2–3 (1991) (observing that most investigators of policy instruments have "disaggregated the policy process into a series of stages and identified instrument choice with the stages of policy formulation and/or policy implementation").

166. *See, e.g.,* Howlett & Ramesh, *supra* note 164, at 4.

167. *See* Jamie Peck, *Geographies of Policy: From Transfer-Diffusion to Mobility-Mutation*, 35 PROG. HUM. GEOG. 773, 776 (2011) (describing "orthodox conceptions of policy transfer" as premised on "the notion of the policy-maker as an optimizing, rational actor, scanning the 'market' for potential policy products, along with the modernist conception of effective or superior policies diffusing (first and fastest) across jurisdictional spaces").

168. *Id.*

and state/local policy experimentation.[169] Early work in this area focused on the diffusion of policies in areas such as education, welfare, and civil rights.[170] By the 1980s, scholars working in international relations and related fields had adapted the basic model of domestic policy diffusion to the international context, with a strong focus on economic development and, later, environmental policy.[171] These studies typically employed a simple center-periphery model focused on policy experimentation in advanced early mover jurisdictions and the emulation and adoption of policies in less advanced jurisdictions.[172] States were assumed to be (and treated as) rational actors that were moving through various stages of development according to a crude version of modernization theory.[173] Explanations of the mechanics of policy diffusion in particular cases fell into several different categories: coercion by powerful states, competition, learning and emulation, and harmonization.[174]

Notwithstanding the enormous influence of the standard policy diffusion story, however, it is incomplete in important ways. In particular, it stops short of important questions regarding *how* specific policies travel and get re-made in the process. It rarely attends to the role of knowledge practices, much less the actual networks of actors and institutions engaged

169. *See, e.g.*, Jack L. Walker, *The Diffusion of Innovation Among the American States*, 63 AM. POL. SCI. REV. 880, 881 (1969) (describing policy diffusion as "the relative speed and the spatial patterns of adoption of new programs, not their invention or creation").

170. *See, e.g.*, Virginia Gray, *Innovation in the States: A Diffusion Study*, 67 AM. POL. SCI. REV. 1174, 1174 (1973) (discussing policy diffusion among the states in education, welfare, and civil rights).

171. *See* Harold Wolman, *Understanding Cross National Policy Transfers: The Case of Britain and the US*, 5 GOVERNANCE 27 (1992); Johanna Bockman & Gil Eyal, *Eastern Europe as a Laboratory for Economic Knowledge: The Transnational Roots of Neoliberalism*, 108 AM. J. SOCIO. 310 (2002). On the transnational diffusion of environmental regulatory instruments, *see* Per-Olof Busch et al., *The Global Diffusion of Regulatory Instruments: The Making of a New International Environmental Regime,* 598 ANN. AM. ACAD. POL. SOC. SCI. 146, 146–47 (2005) (explaining the global spread of new environmental policy instruments since the 1990s as process of international policy diffusion).

172. *See* Peck, *supra* note 167, at 775 (describing the standard policy diffusion model as one "in which policies diffuse unidirectionally from the capitals of innovation to hinterlands of emulation").

173. *Id.* at 776.

174. *See, e.g.,* Charles R. Shipan & Craig Volden, *The Mechanisms of Policy Diffusion*, 52 AM. J. POL. SCI. 840, 840 (2008) (identifying four mechanisms of policy diffusion: learning, competition, imitation, and coercion).

in policy development and implementation. And it does not look reflexively at how the underlying conception of policy mobility itself shapes and constrains the possibility for policy innovation and learning in different contexts.

More recent work in various social science disciplines, some of which goes under the rubric of "critical policy studies," has sought to offer a corrective.[175] By focusing on the ideologies, networks, and infrastructures that allow policies to travel, this work seeks to situate and explain the phenomena of policy mobility—what two geographers refer to as "fast policy"—in a broader context of globalization and neoliberal statecraft.[176]

This work is valuable not only because it seeks to explain how policies travel but also because it focuses on the impacts that "fast policy" often has on domestic policy processes, diminishing the capacity for homegrown innovation, compressing policy-making cycles, exacerbating policy churn, and encouraging isomorphic mimicry.[177] Rather than assuming a stylized model of technocratic modernization, where policy innovation happens primarily in advanced jurisdictions and then diffuses to those lagging behind, this new work in critical policy studies seeks to unpack the assumptions and ideologies implicit in the standard model while also seeking to understand the real conditions under which different policy projects get traction in particular places.

Viewed through this lens, emissions trading and carbon pricing look like quintessential examples of fast policy.[178] They are among the most visible cosmopolitan policy projects operating in the world today, and there is a growing body of research that characterizes the spread of these instruments in

175. *See, e.g.*, Frank Fischer et al., *Introduction to Critical Policy Studies*, *in* HANDBOOK OF CRITICAL POLICY STUDIES 1–5 (Frank Fischer et al., eds., 2017) (describing emergence and theoretical evolution of critical policy studies).

176. PECK & THEODORE, *supra* note 17, at xxxi-xxxii. *See also* Powers et al,, *supra* note 71, at 74 (discussing phenomenon of fast policy in the context of energy and climate policy and its detrimental impacts on local policy processes).

177. *Id. See also* BOB JESSOP, STATE POWER 193–94 (2008) (discussing dynamics of fast policy and how it limits deliberation and participation); ANDREWS ET AL., *supra* note 18, at 29 (2017) ("[I]somorphic mimicry is the tendency of governments to mimic other governments' successes, replicating processes, systems, and even products of the 'best practice' examples. This mimicry often conflates form and function: leading to a situation where 'looks like' substitutes for 'does'; i.e., governments look capable after the mimicry but are not actually more capable.").

178. *See* Powers et al., *supra* note 71.

terms that mimic the standard diffusion story.[179] In the meantime, an entire industry of experts, consultants, and policy professionals has emerged to support their spread, which has in turn worked to reinforce the official history noted above and a simple progressive story of innovation, refinement, and diffusion. But the real institutional history of these instruments, as we will see, suggests a far more complicated story.

B. Emissions Trading in Practice

Much of the official history of emissions trading traces a standard arc from theory to practice. Once the concept of emissions trading had been developed and refined by economists and others, the story goes, it was then put into practice. The reality, however, is quite different. In fact, early experiments with bubbles, offsets, and trading under the Clean Air Act did not draw upon economic theory in any systematic way but instead represented practical efforts to deal with the political consequences of non-attainment under the National Ambient Air Quality Standards (NAAQS).[180] These were not applications of theory, but concrete efforts to solve pressing problems of implementation. Their *post hoc* appropriation by economists and others seeking to bolster support for emissions trading thus says more about the ideological project pushed by the proponents of emissions trading than it does about any actual journey from theory to practice.

But theory and practice did begin to converge in the late 1980s and early 1990s, most prominently with the establishment of a formal cap-and-trade program to reduce SO_2 emissions and control acid rain under Title IV of the Clean Air Act (often referred to as either the SO_2 or acid rain trading program).[181]

179. For specific attention to the development and spread of emissions trading, often framed as a classic case of "policy diffusion," see Katja Biedenkopf et al., *A Global Turn to Greenhouse Gas Emissions Trading? Experiments, Actors, and Diffusion*, 17 GLOB. ENV'T POLITICS 1, 1–2 (2017) (investigating diffusion emissions trading systems); Matthew Paterson et al., *The Micro Foundations of Policy Diffusion Toward Complex Global Governance: An Analysis of the Transnational Carbon Emission Trading Network*, 47 COMP. POL. SCI. 420, 420 (2014) (characterizing spread of emissions trading systems as "polycentric diffusion").

180. *See* discussion Part III.B, *infra*.

181. *See* To amend the Clean Air Act to provide for attainment and maintenance of health protective national ambient air quality standards, and for other purposes, Title

This was the moment when emissions trading went mainstream, and it provided a major boost to efforts during the 1990s to extend these new market-based approaches to greenhouse gases.[182] As this Part shows, however, the much touted success of the SO_2 trading program is not as robust as some proponents have suggested and the spread of emissions trading as a preferred instrument for reducing greenhouse gases (GHGs) has been far more contingent and uneven than the standard narrative suggests. In all cases, moreover, the challenges of building and maintaining these markets have required extensive and ongoing regulation, straining and sometimes exceeding the capacity of governments. Making emissions trading work in practice has turned out to be far more complicated than early proponents suggested.[183]

1. Looking for Least-Cost Solutions

During the late 1960s, scientists and civil servants at the National Air Pollution Control Administration (one of EPA's predecessor agencies) began to use computer simulations to compare different approaches to reducing regional air pollution. The federal Air Quality Act of 1967 had called for the establishment of air quality control regions across the country and required that these different regions establish and demonstrate attainment with regional air quality standards for major criteria pollutants.[184] This was the germ of what became the NAAQS program in the 1970 Clean Air amendments.[185]

These early air pollution modeling efforts focused primarily on large metropolitan areas struggling with bad air quality. During the late 1960s and early 1970s, Ellison Burton, a

IV- Acid Deposition Control, Public Law 101-549, 101 Congress. 104 Stat. 2399, 2584-2634 (1990).

182. *See, e.g.*, Barry D. Solomon, *Global CO_2 Emissions Trading: Early Lessons from the U.S. Acid Rain Program*, 30 CLIMATIC CHANGE 75 (1995).

183. *See, e.g.,* DALES, *supra* note 76, at 97 (observing that the "administrative simplicity" of a market in pollution rights is "one of its main attractions"); Ackerman & Stewart, *Reforming Environmental Law, supra* note 24, at 1348 (arguing that the "bureaucratic tasks" involved in managing a system of marketable permit are, "in the aggregate, a good deal easier to discharge than the bureaucratic functions they displace").

184. *See* Air Quality Act of 1967, P.L. 90-148, 81 Stat. 485 (1967).

185. *See* Clean Air Amendments of 1970, P.L. 91-604, 84 Stat. 1676 (1970). The core of the NAAQS program was contained in sections 108, 109, and 110. *See* 84 Stat. 1676, 1678–83. *See also* Boyd, *supra* note 69 (tracing history of NAAQS program).

mathematician, and William Sanjour, a physicist, produced a series of studies on different approaches to urban air pollution abatement. Drawing from operations research and linear programming, they developed mathematical models of cities and their emissions sources to compare the cost and effectiveness of various abatement strategies.[186] The goal was to assess different approaches to pollution control, with particular attention to "least-cost" strategies.[187]

Some commentators have mistakenly identified Burton and Sanjour as economists and suggested that their efforts constituted an early incarnation of the idea of emissions trading that drew upon the work of Coase, Crocker, and Dales.[188] In fact, they were not economists. They never mentioned Coase, Crocker, or Dales in any of their work. They did not focus on property rights. And they never proposed anything like emissions trading.

What they did do was to initiate the first systematic study of alternative approaches to controlling pollution in different cities. These efforts can thus rightly be seen as the beginning of an effort to apply least-cost principles to the very complex pollution abatement challenge in these regional airsheds.[189] In a 1972

186. *See, e.g.,* ELLISON BURTON & WILLIAM SANJOUR, AN ECONOMIC ANALYSIS OF THE CONTROL OF SULPHUR OXIDES AIR POLLUTION, DHEW PROGRAM ANALYSIS REPORT NO. 1967-69 (1967); ELLISON BURTON & WILLIAM SANJOUR, A COST-EFFECTIVENESS STUDY OF PARTICULATE AND SOx EMISSION CONTROL IN THE NEW YORK METROPOLITAN AREA, NTIS: PB-227 121/1, CONTRACT NO: PH-86-68-37 (1968); Ellison Burton & William Sanjour, *A Simulation Approach to Air Pollution Abatement Program Planning*, 4 SOCIO-ECON. PLAN. SCI. 147 (1970); Ellison Burton et al., *Solving the Air Pollution Control Puzzle*, 7 ENV. SCI. & TECH. 412 (1973).

187. See, e.g., Ellison Burton & William Sanjour, *Multiple Source Analysis of Air Pollution Abatement Strategies*, 18 FED. ACCT. 49, 66–69 (1969) (discussing "least-cost solutions" to air pollution abatement).

188. *See, e.g.,* Raphael Calel, *Carbon Markets: A Historical Overview*,4 WIREs CLIMATE CHANGE 107, 109 (arguing that these early modeling efforts bore the influence of Coase, Crocker, and Dales); Franklin Allen & Glenn Yago, *Environmental Finance: Innovating to Save the Planet*, 23 J. APP. CORP. FIN. 99, 107 (2011) ("Two economists working for the precursor organization to the U.S. EPA, Ellison Burton and William Sanjour, decided to tackle the problem from a unique angle, building on the work of Coase and others. In their quest to find a low-cost, decentralized solution for abatement, they hit upon the idea of creating an actual marketplace to control emissions."); Joel Kurtzman, *The Low-Carbon Diet: How the Market Can Curb Climate Change*, 88 FOREIGN AFFS. 114, 115 (2009) ("The conceptual framework for cap-and-trade systems was laid out in the 1960s and 1970s by two economists, Ellison Burton and William Sanjour, who worked for the U.S. National Pollution Control Administration, which was eventually folded into the EPA.").

189. *See, e.g.*, Edward H. Pechan et al., *Computerized Regional Air Pollution Abatement and Fuels Use Modeling*, 1 COMPUT. & OPS. RES. 39, 40 (1974) (discussing the application of "the techniques of operations research and the powers of large scale

discussion with EPA Administrator William Ruckelshaus and others, Burton explained that his group was "studying less costly ways of achieving clean air."[190] Their goal, he noted, was to develop "regional least cost strategies, which may be on the order of only a fourth as costly as typical strategies now proposed."[191] Such strategies, moreover, "could be implemented through the use of effluent fees or other incentives for effecting self-regulation."[192] In sum, "the ideal system would achieve substantial benefits from air pollution abatement not only at minimum cost but also with minimum regulatory intervention."[193]

By the early 1970s, then, civil servants and officials at EPA were beginning to frame least-cost approaches to air pollution abatement in the language of economics and had started to assess the prospects of using market-based tools such as effluent fees. But it would be a mistake to assume from this that Burton, Sanjour, and others at EPA were taking their insights from the emerging economics literature on instrument choice.[194] Instead, their work reflected the influence of operations research, linear programming, and the emerging science of decision-making. Optimization was the goal, based on elaborate computer simulations of different approaches.

2. Pragmatism and Flexibility Under the Clean Air Act

These general concerns regarding the costs of air pollution control became much more tangible during the first half of the 1970s as states struggled to comply with the newly established NAAQS.[195] In stubborn non-attainment regions such as

computing systems" to "the development and evaluation of regional air pollution abatement strategies"); *id.* ("The regional control problem lends itself to formulation as an optimization problem.").

190. Ellison Burton, Remarks to EPA Administrator William Ruckelshaus at EPA Region IX, Cost of Cleaning the Environment Presentation (1972), transcript at 46.

191. *Id.* at 46–47.

192. *Id.*

193. *Id.*

194. *See, e.g.,* Burton & Sanjour, *supra* note 187, at 62–69 (comparing the efficiency of different control strategies for abatement of regional air pollution). *See also id.* at 66 (characterizing the least-cost solution as one that "selects those emission sources which can get the most abatement per dollar, so that some sources may not be affected").

195. *See* Clean Air Amendments of 1970, P.L. 91-604, 84 Stat. 1676 (1970). The core of the NAAQS program was contained in sections 108, 109, and 110. *See* 84 Stat. 1676, 1678–83.

southern California, the challenge was particularly acute.[196] Under a strict reading of the law, bringing these areas into attainment with the NAAQS meant no new industry and severe restrictions on both stationary and mobile sources.[197] At one point, there was even discussion of the possibility of imposing severe restrictions on driving during the summer in southern California.[198]

Needless to say, the potential fallout of such draconian limits on economic activity posed a serious political challenge to EPA. In response, EPA's regional office in San Francisco began to experiment with more flexible approaches that would resolve some of the challenges associated with NAAQS non-attainment.[199] From this and other similar efforts across the agency, the practice of using bubbles, offsets, and netting to ease the burden of Clean Air Act compliance emerged.[200] All of these approaches were formalized in regulations and legislative amendments in subsequent years and, along with a modest program for trading lead reduction credits as part of EPA's

196. *See* Ronald H. Rosenberg & Bruce A. Friedman, *Air Quality and Industrial Growth: The Location of New Industrial Sources of Pollution in Non-Attainment Areas*, 11 NAT. RES. LAWYER 523, 527–28 (1979) (discussing challenges of permitting new industrial sources under CAA in southern California and other major industrial areas).

197. *Id*. *See also* Errol Meidinger, *On Explaining the Development of "Emissions Trading" in U.S. Air Pollution Regulation*, 7 LAW & POL. 447, 456 (1985).

198. *See* JAMES E. KRIER & EDMUND URSIN, POLLUTION AND POLICY: A CASE ESSAY ON CALIFORNIA AND FEDERAL EXPERIENCE WITH MOTOR VEHICLE AIR POLLUTION 1940—1975 at 218–23 (1977) (discussing EPA's proposal for extensive gasoline rationing during the summer as part of the transportation control measures needed to achieve NAAQS compliance in Los Angeles).

199. *See, e.g.*, Paul DeFalco, Jr., *Regional Goals*, 26 J. AIR POLLUTION CONTROL ASSOC. 839, 840 (1976) (discussing different regional challenges and need for flexible offsets policy under Clean Air Act's New Source Review program); JOHN PALMISANO, THE ENVIRONMENT GOES TO MARKET: THE IMPLEMENTATION OF ECONOMIC INCENTIVES FOR POLLUTION CONTROL 31 (1994) (noting EPA Region IX Director Paul DeFalco's role in developing a "creative interpretation" of the CAA to allow for the use of offsets to permit new sources in nonattainment areas). *See also* RICHARD A. LIROFF, AIR POLLUTION OFFSETS: TRADING, BANKING, AND SELLING 6–11 (1980) (discussing development of the offsets policy). Liroff also mentions in endnote 20 that "EPA's Region IX had been employing an offset policy informally prior" to EPA's formal Offsets Interpretive ruling in 1976. *Id*. at 47.

200. *See* Daniel J. Dudek & John Palmisano, *Emissions Trading: Why is this Thoroughbread Hobbled?* 13 COLUM. J. ENV'T L. 217, 223–28 (1988) (discussing offsets, bubbles, netting, and banking).

phaseout of leaded gasoline in the 1980s, they have often been identified as precursors to emissions trading.[201]

Two points are important to emphasize here. First, there is no evidence that anyone directly involved in these early initiatives was reading Coase, Crocker, Dales, or any other economist. Indeed, upon closer inspection, the early offsets program looks more like a case of creative regulators solving a problem by creating flexible compliance options rather than an effort to test whether a market-based approach could work in practice. Put another way, this was not an effort to apply the insights of economic theory, but a pragmatic approach to solving the problem of how to permit new sources in non-attainment areas. In effect, this first example of "emissions trading" was an unintended consequence of the Clean Air Act and can be read as a feature of the flexible experimentalist design of the NAAQS program itself rather than an effort to import market-based tools into a command-and-control program.[202]

Second, there was no serious and sustained trading, and no system to support trading under these programs.[203] These were

201. *See, e.g.,* Air Quality Standards; Interpretive Ruling, 41 FED. REG. 55524 (Dec. 21, 1976) (setting forth EPA's interpretive ruling on the use of offsets under new source review for non-attainment regions). Congress then codified the program in the 1977 Clean Air Act Amendments. EPA then issued a revised and expanded Emission Offset Interpretive Ruling in 1979. *See* 44 FED. REG. 3274 (Jan. 16, 1979). The offsets provisions were then combined with the rules governing bubbles, netting, and banking into a set of guidelines for "controlled trading" in the early 1980s and then into a single Emissions Trading Policy Statement issued by EPA in 1986. *See* Emissions Trading Policy Statement; General Principles for Creation, Banking, and Use of Emission Reduction Credits, 51 FED. REG. 43814 (Dec. 4, 1986). *See also* Dudek & Palmisano, *supra* note 200, at 228 (describing Emissions Trading Policy statement as the "umbrella concept" for the use of bubbles, offsets, netting, and banking). On the lead trading program, *see* ALAN CARLIN, THE UNITED STATES EXPERIENCE WITH ECONOMIC INCENTIVES TO CONTROL ENVIRONMENTAL POLLUTION 5-8 to 5-9 (U.S. EPA, 1992).

202. *See, e.g.*, Hugh S. Gorman & Barry D. Solomon, *The Origins and Practice of Emissions Trading*, 14 J. POL'Y HIST. 293, 293 (2002) (arguing that "the first emissions trading programs were an unintended consequence of the Clean Air Act of 1970"). *See also* Meidinger, *supra* note 197, at 468 ("Preventing a serious conflict between environmental regulation and economic growth was a major impetus behind the original offset policy."); RICHARD A. LIROFF, REFORMING AIR POLLUTION REGULATION: THE TOIL AND TROUBLE OF EPA'S BUBBLE 25 (1986) (observing that the offsets program "enabled EPA to avoid imposing politically unpopular bans on the construction of new and modified sources of pollution").

203. *See* CARLIN, *supra* note 201, at 5–14 (noting that under the offsets program some 2,500 offsets trade had occurred, only 10% of which were between firms, with the rest (90%) occurring within firms). Carlin concludes that despite the challenges and limited

typically one-off bilateral transactions tied to permitting decisions for individual sources, with the vast majority of trading (90% by the early 1990s) occurring within firms rather than between firms[204] This is a long way from a well-functioning cap-and-trade program.

Yet, the official history has characterized the use of offsets under the NAAQS program as a "political opportunity" to test the theory of emissions trading and marketable permits that economists had been elaborating since the 1960s.[205] By the second half of the 1980s, this had become the accepted story.[206]

Upon closer inspection, this looks more like an act of historical appropriation than an accurate recounting of what happened. While the use of offsets, bubbles, and netting clearly stemmed from concerns about the costs of more rigid approaches, it is quite a stretch to claim that they represented a straightforward application of economic theory to the problem of air pollution control. Although this may seem like a minor point, it underscores again the larger ideological project that supported the rise of emissions trading as a preferred policy tool.

3. Mainstreaming Emissions Trading

During the late 1980s, the theoretical case for emissions trading and the practical effort to use flexible approaches under the Clean Air Act began to converge. This merging of theory and practice received a considerable boost from a newly formed network of policymakers, economists, environmental groups, and others operating under the umbrella of Project 88—an effort

uptake, "savings from trading under the air emissions trading program probably range from $5.5 to over $12.5 billion since 1975." *Id*.

204. *Id*. *See also* Robert W. Hahn & Roger G. Noll, *Designing a Market for Tradable Emissions Permits* 2 (Calif. Inst. Tech. Soc. Sci. Working Paper 398, July 1981) ("The 'controlled trading options' developed by EPA since the passage of the Clean Air Act amendments of 1977—so-called bubbles, offsets and emissions banks—start with the existing regulatory structure as a baseline, and overlay it with the possibility of trades. These trading options retain detailed regulatory reviews of each source and of proposed trades.").

205. *See, e.g*., Tietenberg, *supra* note 73, at 361 (characterizing these early experiments as a "political opportunity to capitalize on the[] economic insights" of the early proponents of emissions trading).

206. *See* Hahn, *supra* note 97, at 98–101 (describing evolution and key components of emissions trading under the Clean Air Act); Meidinger, *supra* note 197, at 456 ("The Offsets and Bubble Policies formed the cornerstones of what would become a unified policy approximating the marketable-permits model explicated a decade earlier by J.H. Dales (1968) and other economists.").

led by Senators Tim Wirth and John Heinz with the explicit aim of advancing market-base approaches to environmental pollution.[207] With a powerful support network pushing it at the highest levels of government, emissions trading was poised to go mainstream.

The 1990 Clean Air Act amendments provided the opportunity.[208] Title IV, which established the famous SO_2 trading program to deal with acid rain, represented the first large-scale experiment with cap-and-trade.[209] According to the standard account, the inclusion of the trading program made passage of the 1990 Clean Air Act amendments "politically possible."[210] In signing the legislation, President George H. W. Bush stated that the trading program "represents the turning of a new page in our approach to environmental problems in this country. The acid rain allowance trading program will be the first large-scale regulatory use of market incentives and is already being seen as a model for regulatory reform efforts here and abroad."[211]

The story of the SO_2 trading program has been told many times.[212] The program itself was relatively simple in design.[213] Once in operation it would deliver a reduction of 10 million tons of SO_2 per year below 1980 levels by the year 2000.[214] Phase I, from 1995-1999, covered the 263 largest and dirtiest generating units in the U.S.[215] Phase II, starting in 2000, extended the program to cover virtually all fossil fuel generating plants in the

207. *See* ROBERT N STAVINS, PROJECT 88—HARNESSING MARKET FORCES TO PROTECT OUR ENVIRONMENT: INITIATIVES FOR THE NEW PRESIDENT, A PUBLIC POLICY STUDY SPONSORED BY SENATOR TIMOTHY E. WIRTH, COLORADO, AND SENATOR JOHN HEINZ, PENNSYLVANIA (1988).

208. *See* To amend the Clean Air Act to provide for attainment and maintenance of health protective national ambient air quality standards, and for other purposes, Public Law 101-549, 101 Congress. 104 Stat. 2399 (1990).

209. *See* Title IV – Acid Deposition Control, 104 Stat. 2399, 2584–2634 (1990).

210. *See* Tietenberg, *supra* note 73, at 362.

211. President George H.W. Bush, Statement on Signing the Bill Amending the Clean Air Act (November 15, 1990), *available at* https://perma.cc/AZ9Q-LPTW.

212. *See, e.g.*, A. DENNY ELLERMAN ET AL., MARKETS FOR CLEAN AIR: THE U.S. ACID RAIN PROGRAM (2000); Richard Schmalensee & Robert N. Stavins, *The SO_2 Allowance Trading System: The Ironic History of a Grand Policy Experiment*, 27 J. ECON. PERSPS. 103 (2013).

213. *See* ELLERMAN ET AL., *supra* note 212, at 6–9 (describing main details of the program).

214. *Id.* at 6.

215. *Id.*

country.[216] Emissions allowances were distributed to regulated firms free of charge, with a small portion held back for auction by EPA for purposes of price discovery.[217] Firms were allowed to bank their allowances for future use.[218] A Continuous Emissions Monitoring System was established, along with a steep penalty for non-compliance.[219]

In establishing the program, however, Congress did not engage in any serious debate about the actual level of emissions (the cap). As Lisa Heinzerling pointed out, the democratic deliberation over ends that was supposed to be one of the key advantages of market-based approaches never occurred.[220] Most of the attention was directed instead at the procedures for allocating allowances and the more technical details (always a focus for well-paid industry lobbyists) of how the program would function.[221]

While a handful of environmental groups embraced the new approach, much of the environmental community was skeptical. Concerns ranged from the uneven distributional impacts that could result from trading, with pollution hot spots created around facilities that chose to purchase allowances and continue emitting, thereby creating disproportionate impacts on frontline communities, to more general arguments that "Trading in the Right to Pollute," as a New York Times editorial put it, represented a corruption of environmental law's foundational commitments to preventing harm and protecting public

216. *Id.*
217. *Id.* 7–8.
218. *Id.* at 7.
219. *Id.* at 9.
220. *See* Heinzerling, *supra* note 26, at 303 ("Congress appears to have paid scarcely any attention to the pollution level set by the 1990 Amendments and to have concentrated instead on satisfying powerful interest groups through its allocation of permits.").
221. *See, e.g.,* Paul L. Joskow & Richard Schmalensee, *The Political Economy of Market-Based Environmental Policy: The U.S. Acid Rain Program*, 41 J.L. & ECON. 37, 38 (1998) ("Because emissions permits are valuable and decisions about their distribution are made by political institutions, these decisions are likely to be highly politicized, reflecting rent-seeking behavior and interest group politics."); A. DENNY ELLERMAN ET AL., MARKETS FOR CLEAN AIR: THE U.S. ACID RAIN PROGRAM 34–35 (2000) (observing that the "complex statutory provisions governing allowance allocations" under the acid rain program "clearly show the effects of significant rent seeking by several different interest groups").

health.[222] These concerns, particularly those focused on distributional impacts, have continued to haunt emission trading programs across a range of sectors and have been a key component of the larger environmental justice critique of mainstream environmental law.[223]

In terms of performance, SO_2 emissions did decline significantly by the end of the 1990s, falling well below the caps and well in advance of the deadlines. By 1999, actual emissions from generating units subject to Phase I were 2 million tons below the cap.[224] By 2008, units subject to Phase II had reduced emissions below the cap by a similar amount.[225] Witnessing these reductions, many economists and other observers were quick to claim that the theory of emissions trading had been vindicated.[226]

But the overall success of the program was not as robust as early boosters claimed. Indeed, soon after the program began

222. *See* Michael J. Sandel, *It's Immoral to Buy the Right to Pollute*, N.Y. TIMES (Dec. 15, 1995), *available at* https://perma.cc/3Y8P-MCTP. *See also* THOMAS O. MCGARITY, POLLUTION, POLITICS, AND POWER: THE STRUGGLE FOR SUSTAINABLE ELECTRICITY 129–30 (2019) (discussing opposition by environmental groups to SO_2 trading program); Lilly N. Chinn, *Can the Market be Fair and Efficient? An Environmental Justice Critique of Emissions Trading*, 26 ECOL. L.Q. 80, 82–83 (1999) (discussing early environmental justice critiques of emissions trading programs). The environmental justice critique of emissions trading programs has become increasingly important and visible in the context of California's cap-and-trade program for greenhouse gases, focusing on the potential for this program to exacerbate environmental injustices by exposing frontline communities to co-pollutants. *See, e.g.*, Manuel Pastor et al., *Risky Business: Cap-and-Trade, Public Health, and Environmental Justice*, *in* URBANIZATION AND SUSTAINABILITY: LINKING URBAN ECOLOGY, ENVIRONMENTAL JUSTICE, AND GLOBAL ENVIRONMENTAL CHANGE (HUMAN-ENVIRONMENT INTERACTIONS, VOL 3.) 90 (Christopher G. Boone & Michail Fragkias eds., 2013) (reporting on empirical study using facility-level and neighborhood data that documents disparities in emission burdens by race and ethnicity and concluding that "some carbon trades could worsen disparities in emissions burdens by race and ethnicity").

223. *See, e.g.,* Kaswan, *supra* note 7, at 161 ("Market-based programs like cap-and-trade are in fundamental tension with the environmental justice paradigm. From a distributive justice perspective, they are indifferent to place. . . . The environmental justice community fears emission hot spots created by an industry or concentrated group of industries purchasing allowances rather than reducing emissions. From a participatory justice perspective, the industry flexibility and reduced governmental role a market-based system offers runs counter to the environmental justice movement's pursuit of participatory engagement and democratic empowerment.").

224. Michael Hanneman, *Cap-and-Trade: A Sufficient or Necessary Condition for Emission Reduction*, 26 OXFORD REV. ECON. POL. 225, 226 (2010).

225. *Id.*

226. *Id.* ("The empirical success with SO_2 reduction was not unexpected by economists. The economic explanation dates back to Crocker (1966), Dales (1968), and Montgomery (1972).").

operating in 1995, various observers noted that allowance prices were significantly lower than expected and that trading of allowances was quite limited.[227] Based on a series of studies, it also appeared that a substantial share of the reductions in SO_2 emissions from power plants were coming from factors that had nothing to do with the trading program, such as the deregulation of freight-rail rates that allowed for shipment of low-sulfur coal from the Powder River Basin to eastern and midwestern utilities and declining costs for scrubbers.[228] Subsequent analyses have confirmed these findings.[229]

The program also proved unable to adapt to the effects of other programs, notably the NAAQS.[230] As evidence of the health effects of fine particulates (PM 2.5) and the role of SO_2 as a precursor to PM 2.5 became apparent during the 1990s and 2000s, new regulations under the NAAQS program required substantial additional reductions in SO_2, rendering the cap under the Title IV program non-binding.[231] But because

227. *See, e.g.*, A. Denny Ellerman & Juan-Pablo Montero, *The Declining Trend in Sulfur Dioxide Emissions: Implications for Allowance Prices*, 36 J. ENV'T ECON. MGMT. 26, 26 (1998) (observing that the "low price of allowances has been a frequently noted feature of the implementation of Title IV of the Clean Air Act"); Dallas Burtraw, *The SO_2 Emissions Trading Program: Cost Savings Without Allowance Trades*, 14 CONTEMP. ECON. POL. 79, 79–80 (1996) (observing low costs and limited trading of allowances during initial years of the program).

228. *See* Ellerman & Montero, *supra* note 227, at 27 (concluding that "SO_2 emissions have declined mostly for reasons unrelated to Title IV [and that] as a result the emission constraint imposed by Title IV is less binding, and the marginal cost of compliance, as well as the price of allowances, can be expected to be lower than had been initially predicted"); Ellerman and Montero point specifically to the deregulation of freight rail rates in the 1980s as the principal cause. *See id.* at 43. *See also* Burtraw, *supra* note 227, at 88–90 (discussing various factors contributing to reduced SO_2 emissions, including deregulation of freight rail rates and declining costs of scrubbers).

229. *See* Hanneman, *supra* note 224, at 228 (discussing coal switching as a result of railroad deregulation and declining prices for scrubbers as major factors driving reductions of SO_2 emissions by electric utilities); Schmalensee & Stavins, *supra* note 212, at 111–12 (discussing railroad deregulation and switch to low-sulfur coal as responsible for a substantial share of emissions reductions during the early years of the program).

230. Schmalensee & Stavins *supra* note 212, at 116 ("While the SO_2 allowance market functioned well, the broader regulatory environment served to end its effective life.").

231. *Id.* at 114–15. *See also* Douglas W. Dockery et al., *An Association between Air Pollution and Mortality in Six U.S. Cities,* 329 NEW ENG. J. MED. 1753, 1759 (1993) (documenting excess mortality from exposure to fine particle pollution). *See* National Ambient Air Quality Standards for Particulate Matter, 62 FED. REG. 38,652, 38,654, 38,655 (July 18, 1997) (citing recent epidemiological evidence regarding health impacts of fine particulates and establishing new national ambient air quality standard for PM2.5).

Congress had not given EPA sufficient flexibility to adjust the cap, the program was rendered obsolete.[232]

What the acid rain trading program really illustrated then was the challenge of designing a cap-and-trade program in the face of uncertainty about impacts, drivers of cost reductions, and interactions with other laws and programs. Because the program was designed in relative isolation from these other factors, which was itself a product of the abstract conception of policy instruments that emissions trading exemplified, there was no real effort to build in flexibility to adapt to changing external conditions.

And, yet, despite these challenges, the SO_2 trading program has been widely touted as a very successful experiment in emissions trading.[233] Its influence on environmental law and policy has been enormous, providing a source of pride for those pushing market-based approaches to pollution control and a common point of reference for critiques of earlier, more prescriptive forms of regulation. If one had to choose a poster child for second generation environmental law, the acid rain program would be it.[234]

The much heralded success of the program also provided crucial support for the arguments advanced by scholars and policy professionals that the same tool could be used to tackle the much larger and more complicated problem of climate change.[235] Indeed, it is not too much of an exaggeration to claim that the SO_2 trading program marked a key inflection point in the official history of cap-and-trade—the moment when it

232. Schmalensee & Stavins *supra* note 212, at 114 ("But the law did not give the EPA authority to adjust the Title IV program, such as by tightening the overall cap, in response to new information about the benefits (or costs) of emissions reductions.").

233. *See* Tietenberg, *supra* note 73, at 362 ("The most successful version of emissions trading to date has been its use in the United States for controlling electric utility emissions contributing to acid rain.").

234. *See, e.g.*, Hanneman, *supra* note 224, at 225–26 ("The success of allowance trading for Sulphur dioxide (SO_2) in the US under the 1990 Amendments to the Clean Air Act (CAA) has been widely seen as creating a new paradigm for government regulation of the environment.").

235. *See* Rabe, *supra* note 58, at 43. *See also* W. David Montgomery & Anne E. Smith, *Price, Quantity, and Technology Strategies for Climate Change Policy*, *in* HUMAN-INDUCED CLIMATE CHANGE: AN INTERDISCIPLINARY ASSESSMENT 328 (Michael E. Schlesinger et al. eds., 2007) ("Cap-and-trade was such a popular policy prescription during the 1990s that almost the entire discussion about climate change policy during that time was cast in terms of how to design a greenhouse gas (GHG) trading program.").

became the instrument of choice for reducing greenhouse gas emissions. [236]

For if ever there were a problem that seemed tailor made to the use of cap-and-trade, it was GHG emissions. Almost everything about the problem seemed to cry out for trading. Greenhouse gases such as carbon dioxide exert the same environmental effect regardless of where they are emitted.[237] Vast differences in the marginal cost of abatement across a huge number of sources indicate significant potential gains from trade.[238] And trading among sources does not produce any local hotspot effects for the primary pollutants targeted by the program.[239]

236. *But see id.* at 189 ("In retrospect, the American sulfur dioxide experience would prove more of a flukish case rather than a reliable model for carbon.").

237. *See* Lawrence A. Goulder & William A. Pizer, *The Economics of Climate Change* 9 (NBER Working Paper 11923, 2006) ("The defining feature of the climate-change problem may be its intrinsically global nature. Greenhouse gases tend to disperse themselves uniformly around the globe. As a result, the climate consequences of a ton of emissions of a given greenhouse gas do not depend on the location of the source, either within or across national borders, and shifts in emissions across locations do not change global climate impacts. Under these circumstances, economic efficiency calls for making market-based systems as geographically broad as possible."). The challenge of creating an equivalence between the global warming effects of different greenhouse gases, given their different radiative forcings and residence times, has been addressed through the use of Global Warming Potentials, which uses the currency of CO_2-equivalent (the global warming potential of a ton of CO_2) as the baseline. For a discussion, see Donald MacKenzie, *Making Things the Same: Gases, Emission Rights and the Politics of Carbon Markets*, 34 ACCT. ORG. & SOC. 440 (2009).

238.*See* A. DENNY ELLERMAN & ANNELÈNE DECAUX, MIT JOINT PROGRAM ON THE SCIENCE AND POLICY OF GLOBAL CHANGE REPORT 40: ANALYSIS OF POST-KYOTO CO_2 EMISSIONS TRADING USING MARGINAL ABATEMENT CURVES 24 (1998) (concluding that "the potential for gains from trading [CO_2] is huge, because of the considerable differences in abatement costs across regions"). *See also* Fabian Kesicki & Paul Ekins, *Marginal Abatement Cost Curves: A Call for Caution*, 12 CLIMATE POL'Y 219, 220 (2012) (discussing historical development and use of marginal abatement curves in climate policy).

239. *See* David Adelman, *The Collective Origins of Toxic Air Pollution: Implications for Greenhouse Gas Trading and Toxic Hotspots,* 88 IND. L.J. 273, 275 (2013) ("[B]ecause GHGs are global pollutants that do not have direct localized impacts, regulatory experts have considered the risks of hotspots to be essentially zero."); Daniel A. Farber, *Pollution Markets and Social Equity: Analyzing the Fairness of Cap and Trade*, 39 ECOL. L.Q. 1, 27 (2012) ("Hot spots are areas of heavy, localized concentrations of a pollutant. Because emissions trading does not augment or affect minimum local pollution standards in a way that could prevent hot spots, it is poorly suited to address unevenly distributed air pollutants that directly impact public health. Conversely, cap and trade is an appropriate regulatory solution for persistent (and, therefore, well-mixed) pollutants that lack strongly localized negative health effects. In the latter situation, emissions trades between different sources will have little impact on local concentrations of the pollutant, minimizing distributive justice complaints."). However, as both Adelman and Farber

4. Going Global

During the 1990s, U.S. policymakers drew upon these arguments and the experience of the SO_2 trading program to advance the case for emissions trading as a central component of the emerging international climate policy regime.[240] In particular, U.S. diplomats succeeded in their efforts to include emissions trading among state parties as one of several "flexible mechanisms" in the 1997 Kyoto Protocol.[241] Even though the United States never became a party to Kyoto, and affirmatively withdrew from the process in 2001, its success in embedding the concept of emissions trading in the Protocol would prove to be enormously influential in the years ahead.[242]

In particular, the European Union (EU), which had long resisted emissions trading, embraced the instrument as its chief mechanism for complying with Kyoto.[243] Some commentators have characterized the EU's adoption of emissions trading as a straightforward case of policy diffusion: a successful policy

note, co-pollutants produced in conjunction with greenhouse gases may create local hot spots effects. *Id.* *See also* Alice Kaswan, *Environmental Justice and Domestic Climate Change Policy,* 38 ENV'T L. REPS. 10287, 10287–88 (2008).

240. *See* Christian Downie, *Three Ways to Understand State Actors in International Negotiations: Climate Change in the Clinton Years (1993–2000),* 13 GLOB. ENV'T POL'Y 22, 31–32 (2013) (discussing how experience with the Clean Air Act's acid rain trading program influenced the U.S. interagency process during the Kyoto negotiations). *See also* David M. Driesen, *Neoliberal Instrument Choice*, *in* ECONOMIC THOUGHT AND U.S. CLIMATE CHANGE POLICY 129, 134 (David M. Driesen ed., 2010) ("The United States consistently touted the success of the acid rain program as showing that all emissions trading must be a good idea, thereby ignoring the rather more nuanced and richer lessons a reasonably complete history of emissions trading might offer about program design.").

241. *See Kyoto Protocol to the Framework Convention on Climate Change*, UNFCCC, 3d Sess., U.N. Doc. FCCC/CP/1997/7/Add.2 (1997), *reprinted in* 37 I.L.M. (1998). *See also* Driesen, *supra* note 240, at 136 ("Largely, as a result of the United States position, the Kyoto Protocol contains no less than three emissions trading programs."); Cameron Hepburn, *Carbon Trading: A Review of the Kyoto Mechanisms*, 32 ANN. REV. ENV'T RES. 375 (2007) (reviewing the Kyoto mechanisms).

242. Driesen, *supra* note 240, at 135 ("The United States' neoliberal instrument choice position, whatever its technical merits, had an enormous impact on the evolving climate change regime."). *See also* Harold Hongju Koh, *On American Exceptionalism*, 55 STAN. L. REV. 1479, 1485–86 (2003) (characterizing the U.S. double standard regarding the Kyoto Protocol, whereby it influenced the substance of the regime but chose not to be bound by it, as an example the problematic features of American exceptionalism).

243. See Directive 2003/87/EC, of the European Parliament and of the Council of 13 October 2003 Establishing a Scheme for Greenhouse Gas Emission Allowance Trading Within the Community And amending Council Directive 96/61/EC (text with EEA relevance).

instrument developed in one jurisdiction (the United States) was borrowed by or transplanted to another jurisdiction (the EU).[244] There is some truth in this observation: by the early 2000s, the idea of emissions trading, bolstered by the apparent success of the U.S. SO_2 trading program, had become more acceptable to EU policymakers. But there were also important internal political reasons driving adoption of emissions trading; namely, the political impossibility of adopting a harmonized EU-wide carbon tax.[245] Because tax measures require unanimity in the EU, a single member country could effectively block any such measure. By contrast, an emissions trading system could be adopted as an EU wide regulation.[246]

As the EU ETS got up and running, various constituencies invested in the spread and overall success of emissions trading expanded and professionalized. Over a relatively short period of time, emissions trading "evolved from being a non-option for the European Union to the cornerstone of European climate policy."[247] Some saw the EU ETS as a model for the rest of the world. Stavros Dimas, the EU Environment Commissioner declared triumphantly in 2008 that the EU ETS would be "the prototype for the world to imitate."[248]

But the overall record of the EU ETS has been mixed at best. Problems of overallocation, price volatility, fraud, windfall payments, and, most importantly, limited encouragement of low carbon investment have raised questions about the overall efficacy of the instrument.[249] Recent efforts to resolve the over-allocation problem and raise prices appear to be working, but

244. *See, e.g.,* Jonathan Wiener, *Better Regulation in Europe*, 59 CURRENT LEGAL PROBS. 447, 457 (2006) (noting "the remarkable fact that Europe has also borrowed the regulatory tool of emissions trading from the US in order to implement the Kyoto Protocol").

245. *See* A. DENNY ELLERMAN ET AL., PRICING CARBON: THE EUROPEAN UNION EMISSIONS TRADING SCHEME 9 (2010) (The "EU ETS was a product of two failures. First, the European Commission failed in its initiative to introduce an effective EU-wide carbon energy tax in the 1990s. Second, the Commission fought unsuccessfully against the inclusion of trading as a flexible instrument in the Kyoto Protocol in 1997.").

246. *See, e.g.,* MacKenzie, *supra* note 136, at 154–57 (discussing this history).

247. ELLERMAN ET AL., *supra* note 245, at 28.

248. *See* Jørgen Wettestad & Lars H. Gulbrandsen, *Introduction*, *in* THE EVOLUTION OF CARBON MARKETS: DESIGN AND DIFFUSION 1 (Jørgen Wettestad & Lars H. Gulbrandsen eds., 2017) (quoting Dimas).

249. *See* LUCAS MERRILL BROWN ET AL., THE EU EMISSIONS TRADING SYSTEM: RESULTS AND LESSONS LEARNED 11–28 (2012) (discussing problems of overallocation, price volatility, fraud, windfall profits, and low-quality offsets).

there are ongoing concerns regarding whether prices will remain high enough over a sufficient period of time to stimulate substantial investment in low emissions alternatives.[250] Many EU member states have also adopted their own more aggressive policies to reduce greenhouse gases in order to reach their climate targets.[251]

In the United States, subnational GHG emissions trading systems have been up and running for more than a decade. In 2009, after six years of work, eleven mid-Atlantic and Northeastern states launched the Regional Greenhouse Gas Initiative (RGGI), which imposed a modest cap-and-trade system on CO_2 emissions from the power sector.[252] Although RGGI has functioned relatively well (given its simple design and modest cap), the program was plagued by overallocation problems for several years.[253] In 2013, the RGGI states intervened in the program to significantly reduce the cap starting in 2014.[254] Prices rose accordingly, from around $2.00 a ton to more than $4.00, but have still been quite low (below $6.00 per ton in 2020) and insufficient to encourage significant fuel switching, much less new investment in low carbon technologies.[255]

Several years after RGGI, California launched its own much more ambitious cap-and-trade program.[256] Although the

250. *See Report on the Functioning of the European Carbon Market*, COM (2019) 557 final/2 (2020).

251. *See* Eur. Env't Agency, *National Policies and Measures on Climate Change Mitigation in Europe* (2021) (compiling information on EU member state climate policies), *available at* https://perma.cc/MZ39-NZFR.

252. *See* LEIGH RAYMOND, RECLAIMING THE ATMOSPHERIC COMMONS: THE REGIONAL GREENHOUSE GAS INITIATIVE AND A NEW MODEL OF EMISSIONS TRADING (2016).

253. *See* Easwaran Narassimhan et al., *Carbon Pricing in Practice: A Review of Existing Emissions Trading Systems*, 18 CLIMATE POL'Y 967, 973 ("In spite of careful projections, the emissions cap of 188 million tons that RGGI set in 2005 ended up being too high, as actual emissions were 124 million tons when the programme launched in 2009. This overallocation in the case of RGGI did not represent a substantial problem for the market due to the creation of a price floor which kept allowance prices from falling to near zero."). On the problem of overallocation in cap-and-trade generally, see McAllister, *The Overallocation Problem*, *supra* note 6.

254. *Id.* (noting that the RGGI states tightened the cap by 44% to deal with the over allocation problem); RGGI, *supra* note 65.

255. *See* Man-Keun Kim & Taehoo Kim, *Estimating Impact of Regional Greenhouse Gas Initiative on Coal to Gas Switching Using Synthetic Control Methods***,** 59 ENERGY ECON. 328 (2016) (suggesting modest fuel switching effect).

256. *See* CALIFORNIA ARB, OVERVIEW OF ARB EMISSIONS TRADING PROGRAM (2015), *available at* https://perma.cc/8ZZH-GDUW. The program formally launched in 2012,

enabling legislation—the California Global Warming Solutions Act of 2006—did not mandate cap-and-trade, it did contemplate the possibility of market-based approaches and included several criteria for evaluating such programs in the future.[257] At the urging of then Governor Arnold Schwarzenegger, the California Air Resources Board, one of the most sophisticated environmental regulatory agencies in the world, spent several years designing a cap-and-trade program, learning from the mistakes of other programs such as the EU ETS.[258] Most importantly, California deliberately positioned its cap-and-trade program as one of several major programs intended to reduce greenhouse gases. In particular, California has adopted an aggressive Renewable Portfolio Standard and a Low Carbon Fuel Standard in addition to a host of other policies directed at energy efficiency, distributed generation, storage, electrification of transportation and other sectors, and land use.[259] By design, the California cap-and-trade program is not the driver of emissions reductions in the state, but operates instead as a backstop to pick up emissions not covered by other more prescriptive regulations and to ensure that if those other instruments fail to work as intended, the state will continue to reduce its emissions in accordance with its targets.[260] Redundancy rather than efficiency has been the guiding principle behind California's climate policy, with most of the state's reductions of greenhouse gas emissions coming from other, more prescriptive policies.[261]

with trading starting in 2013. For the first two years it covered electricity generators and large industrial facilities. In 2015, the program was expanded to cover distributors of transportation, natural gas, and other fuels. Overall, the program covers sources responsible for 85% of California's greenhouse gas emissions.

257. *See* California Global Warming Solutions Act of 2006, A.B. 32, 2006 Leg. Reg. Sess. (Ca. 2006), *available at* https://perma.cc/L9YK-7J8L.

258. See Guri Bang et al., *California's Cap-and-Trade System: Diffusion and Lessons*, 17 GLOB. ENV'T POL'Y 12, 13 (2017) ("On the surface, the AB 32 system is very similar to other cap-and-trade systems, but in practice many detailed differences reflect efforts by California policy-makers to avoid flaws they saw in other systems."); *id*. at 27 ("California has very strong competencies in its regulatory agencies that is readily tapped to develop and implement complex and comprehensive environmental policies.").

259. *See, e.g.*, CALIFORNIA ARB, CALIFORNIA'S 2017 CLIMATE CHANGE SCOPING PLAN (2017) (detailing various initiatives to meet California climate targets).

260. Bang et al., *supra* note 258, at 17 (describing role of cap-and-trade program as a backstop and insurance policy to ensure that the State will meet its emissions targets).

261. *Id.* at 13 ("The California system was designed to create the impression that efficient markets were being used to control emissions in the state, when, in fact, most

Over the last decade, a handful of other national and subnational jurisdictions around the world have adopted or are planning to adopt emissions trading systems in one form or another, including New Zealand, South Korea, Switzerland, Quebec, Ontario, South Africa, Colombia, and Mexico.[262] In perhaps the most significant move to date, China launched a national emissions trading system in 2020, after several years of testing via seven regional pilot programs and extensive engagement with a host of international partners.[263]

In addition to a shared enthusiasm for market-based instruments, what connected all of these efforts was a growing infrastructure of consultants, experts, and policy professionals. Starting in the early 2000s, groups such as the International Emissions Trading Association (IETA), the International Carbon Action Partnership (ICAP), and the Carbon Pricing Leadership Coalition (to name some of the most prominent), together with prominent NGOs such as the Environmental Defense Fund (EDF) and multilateral development organizations such as the World Bank have worked to facilitate carbon pricing around the world. At the same time, a cottage industry of bankers, lawyers, consultants, and policy experts has emerged to provide advice and services to governments considering the adoption of various carbon pricing initiatives. In effect, these expert networks have allowed emissions trading and carbon pricing to travel globally. They operate as vectors of fast policy—a carrier class helping to establish emissions trading as policy orthodoxy for the Davos set.

But the uncritical acceptance of such policy orthodoxy did not always go smoothly for those on the receiving end. Witness the

of the real effort in cutting emissions came from more expensive regulatory and procurement mandates.").

262. *See* WORLD BANK GRP., *supra* note 4, at 7. *See also* KNOX-HAYES, *supra* note 75, at 11; Narassimhan et al., *supra* note 253.

263. *See* IEA, CHINA'S EMISSIONS TRADING SCHEME 33–34 (2020) (discussing timeline and design details of China's emissions trading system), *available at* https://perma.cc/236V-DEUQ; Gørild Heggelund et al., *China's Development of ETS as a GHG Mitigating Policy Tool: A Case of Policy Diffusion or Domestic Drivers?,* 36 REV. POL. RES. 168, 179 (2019) (discussing combination of domestic and international factors influencing China's decision to establish an ETS); Katja Biedenkopf et al., *Policy Infusion Through Capacity Building and Project Interaction: Greenhouse Gas Emissions Trading in China*, 17 GLOB. ENV'T POL'Y 91, 102–11 (2017) (documenting extensive involvement by various international actors in development of China's emissions trading regional pilots and national system).

problems that Kazakhstan, a former Soviet Republic and the largest economy in central Asia, has faced in trying to implement an emissions trading system. Known formally as the Kazakhstan Emissions Trading System or Kaz ETS, the program was intended to be up and running by 2013, a mere thirteen months after the Government's decision to adopt an ETS.

By the time the program launched, however, key issues had not been resolved, including the all-important issues of allowance allocation and market oversight.[264] Basic installation-level data were not available.[265] A well-functioning monitoring, reporting, and verification (MRV) system was not in place.[266] There was no registry to track and record allowance transactions.[267] And there were ongoing questions about the scope of the program in future years.[268]

The result was massive confusion and growing resistance from industry, especially as the economy slowed during 2014-15. With criticism mounting and many issues unresolved, the government formally suspended the program in April 2016 and went back to the drawing board. After receiving assistance from the World Bank's Partnership for Market Readiness and a host of other organizations, donor governments, and consultants, Kazakhstan relaunched its ETS on January 1, 2018. The first actual trade of allowances happened at the end of 2019 and the average weighted price of allowances for 2020 was just over one US dollar.[269]

The case of Kazakhstan illustrates the phenomenon of fast policy.[270] In a textbook example of "isomorphic mimicry," Kazakhstan sought to emulate the EU ETS as a set of best practices that had been endorsed by the policy establishment

264. *See* Lars H. Gulbrandsen et al., *Emissions Trading and Policy Diffusion: Complex EU ETS Emulation in Kazakstan*, 17 GLOB. ENV'T POL'Y 115, 127 (2017) (discussing various problems with the Kaz ETS).

265. *Id.*

266. *Id.*

267. *Id.*

268. *Id.*

269. *See* ICAP, KAZAKHSTAN EMISSIONS TRADING SYSTEM 1 (2021), *available at* https://perma.cc/A9X3-WN43.

270. *See* Gulbrandsen et al., *supra* note 264, at 127 ("The fact that policy-makers and legislators assumed that it would be possible to establish an operational ETS from scratch in just over twelve months shows an inadequate grasp of the complexities of such a market-based system.").

and the donor community.[271] In hindsight, it is clear that not enough attention was given to domestic capacity to implement a complicated emissions trading program.[272] Nor was there any serious consideration of alternative approaches (much less the capacity to cultivate novel, innovative approaches). The highly compressed schedule also meant that there was no time for deliberation or meaningful stakeholder involvement. In the end, Kazakhstan lost the better part of a decade in its effort to reduce greenhouse gases and there is no evidence to date that the current program will make any significant difference in driving decarbonization.

This failure to recognize the hard work of implementation is a common theme in the history of emissions trading. Creating an actual, functioning program is much more challenging than the simple model advanced by John Dales and other economists in the 1960s and 1970s and embraced by environmental lawyers during the 1980s. In their view, one of the chief virtues of emissions trading was administrative simplicity. None of these early proponents gave much, if any, thought to the challenges of implementation or to the politics of market design.[273] Yet detailed investigations of various emissions trading markets over the last two decades have revealed the intense politics that often focus on key design issues, the ways in which seemingly technical nuts and bolts issues can make a large difference in program performance, and the considerable challenges involved in running these programs.[274]

IV. THE POVERTY OF THEORY

There is a general, common sense tendency in law and policy to assume that problems come to us fully formed and that the

271. *See id.* at 117 (concluding that "copying and fast-track implementation of a policy model before it is fully developed and adapted to the domestic or local context may prove counter-productive"); ANDREWS ET AL., *supra* note 17, at 29 (arguing that isomorphic mimicry is "endemic in development and has become a primary reason why countries do not build real capability even after years of policy and reform engagement and billions of dollars of capacity building work").

272. *See* Gulbrandsen et al., *supra* note 264, at 127.

273. *See* MacKenzie, *supra* note 136, at 175–76 (discussing the critical importance of market design and what he calls the technopolitics of emissions trading markets).

274. *See id.* at 176 ("[T]o make them successful we need a politics of market design, one that focuses not just on the overall virtues and demerits of market solutions but on technopolitical specifics").

responses we fashion do not affect how we understand those problems.[275] This assumption is deeply embedded in the functionalist model of instrument choice that has dominated environmental law for decades.

But, of course, the oft-cited remark sometimes attributed to Mark Twain contains a great deal of truth: "To a man with a hammer, everything looks like a nail."[276] As various scholars have pointed out across a range of different contexts, tools matter at an epistemic or cognitive level.[277] Policy instruments perform substantive ideological work in formatting problems. By shaping the ways in which we come to see problems, they condition the possibilities for response.

A central claim of this Article is that the theory of instrument choice itself has also shaped and influenced the ways in which we have come to understand state capacity and government problem solving. In viewing state capacity through the lens of instrument choice, we have internalized a restricted view of government that tends to diminish the institutional, human, and technical resources needed for creative problem solving.

Yet, if the compounding crises of the last year have taught us anything, it is the vital importance of mobilizing such resources across multiple public and private domains in order to mount an effective response. Recovering the ability to conceive and execute the kind of broad-based, multi-pronged approach that problems like the COVID-19 pandemic, structural inequality and systemic racism, and climate change demand thus requires that we recognize and interrogate the intellectual and practical constraints that come with the theory of instrument choice we have been working with for much of the last several decades. This Part steps back and offers some provisional thoughts on what a more critical and reflexive theory of instrument choice might look like and its implications for efforts to rethink and reimagine a more responsive and expansive approach to

275. *Cf.* William Boyd, *Ways of Seeing in Environmental Law: How Deforestation Became an Object of Climate Governance*, 37 ECOL. L.Q. 843, 851–57 (2010) (discussing ways in which different knowledge practices shape the way environmental law comes to understand problems and make them into coherent objects of governance).

276. The quote appears to have come from ABRAHAM MASLOW, PSYCHOLOGY OF SCIENCE (1966).

277. *See* William Boyd et al, *Law, Environment, and the Non-Dismal Social Sciences*, 8 ANN. REV. LAW SOC. SCI. 183, 192–98 (2012) (reviewing literatures).

government problem solving in the face of a deepening climate crisis.

A. Policy Instruments, Public Problems, and State Capacities

Although it has roots in mid-twentieth century concerns with the techniques of government, the policy instrument idea came to prominence during the last quarter of the 20th century. The prolonged economic crisis of the 1970s focused attention on the problems of regulation, leading almost naturally to a concern with the relative efficiency of different instruments, which then led (again almost naturally) to a preference for new market-based approaches over incumbent "command-and-control" approaches. All of this was of a piece with the consolidation and growth of the "policy state" during the second half of the twentieth century and, starting in the 1970s, the diminishment of certain categories of state intervention and public provisioning under the relentless assault of neoliberal policy commitments.[278]

Our tendency to think of policy instruments in abstract, isolated terms is a product of these late twentieth century intellectual currents. Separating the tools of statecraft from the messy realities in which they operate provided a clean slate on which to evaluate different instruments while largely ignoring a much harder set of questions regarding how these instruments move though the political process, how they get operationalized in actual programs, and how they influence broader conceptions of government. In economics and environmental law, this

278. *See, e.g.*, KAREN ORREN & STEPHEN SKOWRONEK, THE POLICY STATE: AN AMERICAN PREDICAMENT 28–29 (2017) ("Policy is animated by discontent with the status quo, by circumstances as they unfold, by problems as they arise. The policy motive is open-ended, instrumental, calculating, and creative; it seeks efficiency and anticipates more policy to come. . . . [E[ach policy moves on its own tangent. Although a policy may build on or coordinate with another, the impetus, goals, and guidelines tend to be discrete, particularized, and, to a meaningful degree, independent. This fact complicates the extent to which the future is susceptible to control. A policy state will strive to achieve central direction, to impose some overhead management of its many commitments and goals, but this capacity is not easily cultivated. In the United States, the effort confronts an underlying structure of authority that is fragmented, conflict ridden, and battered regularly by elections."). *See also* DANIEL RODGERS, AGE OF FRACTURE 75 (2012) (describing new found faith in "the wisdom and efficiency of markets" and "disdain for big government taxation, spending, and regulation" as core ideological commitments that took hold across much of the political spectrum in the United States starting in the 1970s).

exercise in progressive abstraction provided the basis for a sustained critique of earlier "command-and-control" approaches to pollution control and widespread enthusiasm for new market-based tools on the ground that they would be cheaper and more democratic.

One common misconception that has resulted from this approach is the idea that policy instruments have a singular essence or true nature that is all too often corrupted by the rent seeking and incompetence that inevitably accompany a policy as it finds its way into the world. And, so, when a policy instrument fails to work as intended, we hear from a chorus of dissatisfied experts bemoaning the ways in which the political process and government bureaucrats have distorted the policy instrument and undermined its ability to deliver. This has been a standard response in the face of ongoing problems with various emissions trading programs and with the use of markets in other domains to solve problems of collective concern.[279]

This is wrong. When it comes to policy instruments and politics, it is always a package deal. Recognizing this *ex ante* and thinking about ways to design policy to accommodate this stubborn reality might help us design better policies and package them together in ways that promote a more positive political reception.[280] But this is not just a question of design,

279. *See, e.g.,* David Schoenbrod & Richard B. Stewart, *The Cap-and-Trade Bait and Switch: The Climate Bill in Congress is not the Market Solution the President Promised,* WALL ST. J. (Aug. 24, 2009), *available at* https://perma.cc/F8WS-LFLY (praising the virtues of cap-and-trade and bemoaning the political distortion of the instrument in the Waxman-Markey climate bill); A. DENNY ELLERMAN ET AL., EMISSIONS TRADING IN THE US: EXPERIENCE, LESSONS, AND CONSIDERATIONS FOR GREENHOUSE GASES iv (2003) ("[E]missions trading programs must be designed properly in order to realize their potential cost-reduction and environmental compliance goals. As with any emissions control program, poor design is likely to lead to disappointing results."). *See also* Kyle C. Meng & Ashwin Rode, *The Social Cost of Lobbying over Climate Policy*, 9 NATURE CLIMATE CHANGE 472 (2019) (documenting massive lobbying effort directed at Waxman-Markey climate legislation). The California electricity crisis of 2000–01 offers another example where the failure of a newly designed market was blamed largely on politics and regulators. *See, e.g.,* Oliver E. Williamson, *Why Law, Economics, and Organization?*, 1 ANN REV. L. SOC. SCI. 369, 384 (2005) ("In the California electricity restructuring effort 'good theories' were naively expected to be implemented without making provision for the realities of the political and regulatory process. Failing to make *ex ante* provision for these realities, politics and regulation are conveniently made the *ex post* scapegoats for behaving in perverse and unanticipated ways that, in large measure, were foreseeable and should have been factored into the calculus.").

280. *See* Lars H. Gulbrandsen et al., *The Political Roots of Divergence in Carbon Market Design: Implications for Linking*, 19 CLIMATE POL'Y 427, 428 (2019)

sequencing, and feedback.[281] There are deeper questions here about the role of the public and its relationship to government problem solving that need to be examined.[282]

The crucial point to recognize is that the policy instrument idea itself, together with the decades long debate over instrument choice, has affected how different publics have come to see and understand certain problems and the possibilities for response.[283] Policy instruments carry with them and actively produce specific representations of the problem or issue to which they are directed.[284] Put another way, instruments contain their own politics of knowledge and social control. They have their

(documenting the divergence of carbon market designs around the world and arguing "that research is needed to reveal how the 'real world' of political forces, mainly within jurisdictions, act as strong intervening variables that affect policy instrument design").

281. *See, e.g.*, Michael Pahle et al., *Sequencing to Ratchet up Climate Policy Stringency*, 8 NATURE CLIMATE CHANGE 861, 861 (2018) (arguing "that barriers to stringent climate policy exist, but can be removed or at least lowered through a policy sequence that enables dynamic ratcheting up"); Jonas Meckling et al., *Policy Sequencing Toward Decarbonization*, 2 NATURE ENERGY 918, 918 (2017) (making the case for "for deliberate sequencing of policies to enable the low-carbon energy transition"); Paul Pierson, *When Effect Becomes Cause: Policy Feedback and Political Change*, 45 WORLD POLS. 595, 597 (1993) ("Now that we know policy choices have political consequences, . . . what needs to be determined is precisely how, when, and where particular effects are likely to occur. We need to ask more complex questions about the extent and operation of feedback."); Jacob S. Hacker & Paul Pierson, *Policy Feedback in an Age of Polarization*, 685 ANN. AM. ACAD. POL. & SOC. SCI. 8, 21 (2019) ("[T]hose seeking to harness government to address collective problems need to be attentive to opportunities to design policy so that it strengthens already supportive groups or induces previously neutral or skeptical groups to reassess their interests once policies are enacted.").

282. *See, e.g.*, AMY E. LERMAN, GOOD ENOUGH FOR GOVERNMENT WORK: THE PUBLIC REPUTATION CRISIS IN AMERICA (AND WHAT WE CAN DO TO FIX IT) 239 (2019) ("When our ideas about public services begin to change, . . . blurring the lines between public and private goods, it becomes easy to think of ourselves as merely individual consumers, rather than part of a political community.").

283. *Cf.* THEDA SKOCPOL, PROTECTING SOLDIERS AND MOTHERS: THE POLITICAL ORIGINS OF SOCIAL POLICY IN THE UNITED STATES 531 (1992) ("Policies not only flow from institutions and politics; they also reshape institutions and politics, making some future developments *more likely* and *hindering* the possibilities of others.").

284. *See* Lacoumes & Le Gales, *supra* note 162, at 10 ("The instrument also produces a specific representation of the issue it is handling."); Jan-Peter Voß, *Innovation Processes in Governance: The Development of 'Emissions Trading' as a New Policy Instrument*, 34 SCI. & PUB. POL'Y 329, 341 (2007) ("Policy instruments are not only dependent variables. To some degree, especially in a more mature state of development, policy instruments shape some of the framework conditions of their application and for their part make a 'choice' with respect to the problems to which they could potentially be applied.").

own distinct political economy and their own theory of government.[285]

The great value of a more reflexive and critical approach to policy instruments is that it trains attention to the recursive effects that instruments have on our understanding of problems and what counts as an appropriate response. Once we start to see policy instruments as part of a broader political economy of knowledge making within and around the state, a more expansive set of positive lessons and normative possibilities opens up.

Most obviously, it becomes clear that policy instruments are not widgets even if it is sometimes helpful to think of them as such. They are not simply things that can be pulled off the shelf and used for this or that problem in this or that place. They are made and remade in specific contexts. They mutate as they travel. They cannot be understood outside of the specific social and material conditions that give them life. And they are never divorced from politics.

Our tendency to view policy instruments as widgets and to reduce the tasks of government to a choice among instruments is, in part, a symptom of a particular mode of abstraction—an illustration of what Edward Thompson referred to in another context as "the poverty of theory."[286] By deflecting attention from the real historical conditions and social relations in which government interventions of any kind are always embedded and realized, these kinds of abstractions tend to take on a life of their own, circulating through expert networks and institutions that too often have only a superficial understanding of the problem at issue.[287] As these efforts become embedded in global, cosmopolitan policy projects, they can do great violence to the

285. *See* Lester M. Salamon, *The New Governance and the Tools of Public Action: An Introduction*, 28 FORDHAM URB. L.J. 1611, 1613 (2011) (observing that each policy instrument "has its own operating procedures, its own skill requirements, its own delivery mechanism, indeed its own 'political economy'").

286. *See* E.P. THOMPSON, THE POVERTY OF THEORY AND OTHER ESSAYS (1978).

287. *See* ANDREWS ET AL., *supra* note 17, at 46 ("Having deemed that a particular development intervention 'works,' . . . too many researchers and policymakers mistakenly take this empirical claim as warrant for advising others that they too should now adopt this intervention and reasonably expect similar outcomes. Among the many difficulties with transplantation is that the organizations charged with implementing the intervention in the novel context are grounded in neither a solid internal or an external folk culture of performance.").

vernacular institutions and capabilities in different jurisdictions around the world.[288]

Putting policy instruments back into real life will require a different kind of legal and social science research that views them in motion, recognizes that they are always contested, and is sensitive to the ideological work that they perform. Some elements of this are already taking shape in the fields of policy history, critical policy studies, and law and political economy.[289] Bringing these insights into environmental law and climate policy could provide the basis for a more reflexive understanding of how policy instruments emerge, gain momentum, and shape the possibilities for action.

Such an understanding might also allow us to begin to investigate the deeper political rationalities that have sustained the instrument choice debate over the last several decades. As this Article has suggested, the framing of government problem solving as a largely technical choice among different instruments based on systematic comparative evaluation leaves little room for new publics to emerge and engage in the kind of collective deliberation over problem solving that should be at the

288. Witness the enthusiasm for "shock therapy" in the effort to install market economies in the former Soviet bloc. In his reflections on E.P. Thompson's contributions to critical legal history, Robert Gordon used this experience to offer a searing indictment of fast policy: "But now more than ever the terrible simplifiers are roaming the globe, prescribing 'shock therapies' for economic stagnation in post-Communist societies and the Third World in the form of 'fixed and stable property rights,' 'privatization,' and 'free markets.' Evidently, they are without the faintest knowledge of the political, legal, and cultural contingencies in which such institutions developed even in the Western capitalist economies—not to mention the human wreckage such development often entailed—and certainly without the slightest reflection on the indigenous political and cultural contexts of their new experiments." *See* Robert Gordon, *E.P Thompson's Legacies*, 82 GEO. L.J. 2005, 2010 (1994). *See also* Peter Evans, *Development as Institutional Change: The Pitfalls of Monocropping and the Potentials of Deliberation*, 38 STD. COMP. INTL DEV. 30, 33 (2004) ("Institutional monocropping rests on both the general premise that institutional effectiveness does not depend on fit with the local sociocultural environment, and the more specific premise that idealized versions of Anglo-American institutions are optimal developmental instruments. . . . International organizations, local policy makers, and private consultants combine to enforce the presumption that the most advanced countries have already discovered the one best institutional blueprint for development and that its applicability transcends national cultures and circumstances.").

289. *See* Fischer et al., *supra* note 175; Jedidiah Britton-Purdy et al., *Building a Law-and-Political-Economy Framework: Beyond the Twentieth Century Synthesis*, 130 YALE L.J. 1784 (2020) (arguing for a new "law-and-political-economy" to legal scholarship built upon a reorientation from twentieth century concerns with efficiency, neutrality, and anti-politics toward power, equality, and democracy).

heart of democratic self-governance.[290] In recognizing this, we can perhaps start to see that state capacity is not a power waiting to be deployed, much less a set of tools that can be mobilized in response to particular well-defined problems. Rather, state capacity is built in the process of struggling to define and solve actual problems in the real world—problems that have been brought to light by and, at the same time, stir into life new publics.[291]

Notwithstanding the rigor that it has brought to the question of government problem solving, the instrument choice debate has taken the whole question of government action out of this broader public context. By defining problems in narrow instrumentalist terms and, all too often, as the absence or lack of a preferred solution (*e.g.,* climate change is a problem of market failure that can be solved by fixing the market), our collective capacities as publics capable of doing the deeper political work to characterize and struggle with real problems have atrophied.[292]

290. *Cf.* DEWEY, *supra* note 19, at 122–23 (observing that "the public is so bewildered that it cannot find itself. . . . What is the public? If there is a public, what are the obstacles in the way of its recognizing and articulating itself? Is the public a myth? Or does it come into being only in periods or marked social transition when crucial alternative issues stand out, such as that between throwing one's lot in with the conservation of established institutions or with forwarding new tendencies.").

291. *See* ANDREWS ET AL., *supra* note 17, at 141 ("[P]roblems force policymakers and would-be reformers to ask questions about the incumbent ways of doing things, and promote a search for alternatives that actually offer a solution (rather than just providing new ways of doing things). . . . [G]etting the right grip on the characterization of the problem can unleash efforts to solve the problem."); LERMAN, *supra* note 282, at 245 ("But at the heart of collective self-governance are citizens who believe that they share common problems and who understand that the role of government is to help achieve this vision. By rebuilding this understanding, we might also revitalize the public reputation. And in so doing, we can build the capacity of government to tackle the serious issues we face as a nation and to work toward a society that benefits us all.").

292. *See* WENDY BROWN, UNDOING THE DEMOS: NEOLIBERALISM'S STEALTH REVOLUTION 39 (2015) ("As neoliberalism wages war on public goods and the very idea of a public, including citizenship beyond membership, it dramatically thins public life without killing politics. Struggles remain over power, hegemonic values, resources, and future trajectories. This persistence of politics amid the destruction of public life and especially educated public life, combined with the marketization of the political sphere, is part of what makes contemporary politics peculiarly unappealing and toxic. . . . Neoliberalism generates a condition of politics absent democratic institutions that would support a democratic public and all that such a public represents at its best: informed passion, respectful deliberation, aspirational sovereignty, sharp containment of powers that would overrule or undermine it."). *See also* Emerson, *supra* note 29, at 189 ("To avoid this dismal fate, it is no answer to abandon the state and attempt to form some kind of social movement without recourse to administrative forms. A public sphere

Recovering those capacities in the case of climate change will require that we reject the elite, inside-the-beltway dealmaking that has characterized so much of federal climate policy for so long and resulted in such spectacular and, some would argue, predictable political failures.[293] But it also requires a reckoning across multiple domains with the ways in which the public has historically been restricted to a largely white and privileged constituency and how this in turn has contributed to a grossly distorted state and ongoing state violence against Black people and other groups. One of the great challenges facing climate politics in the current moment is whether the broad and growing political mobilization demanding climate action, spearheaded by the youth movement, can translate into actual legislation that will rebuild and redirect state capacity in a manner that is not only commensurate with the scale of the problem but also recognizes and responds to its deep connections to structural inequality and structural violence.[294] For far too long, these connections have been largely invisible to mainstream environmental politics—a function in part of the policy instrument theory of state capacity that we have been working with for much of the last forty years.

requires a public law to be efficacious. We need an alternative way to think about the state's functions that remains vital in our intellectual heritage and our institutional practices.").

293. *See* THEDA SKOCPOL, NAMING THE PROBLEM: WHAT IT WILL TAKE TO COUNTER EXTREMISM AND ENGAGE AMERICANS IN THE FIGHT AGAINST CLIMATE CHANGE 129 (2013) (concluding that the U.S. Climate Action Partnership push for cap-and-trade legislation during President Obama's first term "suffered from a failure of democratic political imagination, and a misconception of how U.S. politics generates reform breakthroughs, on the rare occasions when it does. Big, society shifting reforms are not achieved in the United States principally through insider bargains. They depend on the inspiration and extra oomph that comes from widely ramified organization and broad democratic mobilization."), *available at* https://perma.cc/F8JP-33MS.

294. *See* PAUL FARMER, PATHOLOGIES OF POWER: HEALTH, HUMAN RIGHTS, AND THE NEW WAR ON THE POOR 8 (2005) (describing structural violence "as a broad rubric that includes a host of offensives against human dignity: extreme and relative poverty, social inequalities ranging from racism to gender inequality, and the more spectacular forms of violence that are uncontestedly human rights abuses, some of them punishment for efforts to escape structural violence").

B. Emissions Trading, Carbon Pricing, and the Dilemmas of Fast Policy

Looking back at the history of emissions trading and carbon pricing, one sees a recurring story of slippage between theory and practice manifest in a tendency by various economists, lawyers, and policy professionals to appropriate facts and press them into service of a largely untested set of theoretical arguments. The relative ease with which advocates of emissions trading constructed a powerful origins story and then stitched together various subsequent efforts into a single narrative provides an important lesson for those who take their history from people with skin in the game. While it is impossible to know the overall impact of this ideological exercise, there is no question that it contributed to the sustained normative momentum that market-based approaches have enjoyed in climate policy and environmental law.

As suggested, this way of thinking about policy instruments and government intervention has constrained our thinking about solutions to the climate emergency in ways that we may not fully appreciate. While it is undeniably true that emissions trading, and other forms of carbon pricing, can play a role in reducing GHG emissions, the history of emissions trading reveals that it is no match (and unlikely to ever be) for the scale of the challenge.

Indeed, recent estimates indicate that we need to be reducing *global* emissions by at least 7.5% per year, starting now, if we want to have a chance of hitting the 1.5 degree Celsius target.[295] No cap-and-trade program or carbon tax, at any scale, has ever come anywhere close to that level of ambition.[296] We simply have

295. *See, e.g.,* UN ENVIRONMENT PROGRAMME, EMISSIONS GAP REPORT 2019 xx (2019) (reporting that emissions will have to decline by 7.6% per year starting in 2020 on average to reach the goal of limiting warming to 1.5 degrees C).

296. A recent assessment of the EU ETS found that it reduced CO_2 emissions in the EU by about 1.2 billion metric tons between 2008 and 2016, equivalent to a 3.8% reduction in total EU emissions and a 7.5% reduction in sectors covered by the EU ETS over this time period. These reductions are not annual reductions but occurred over a nine year period. On an annual basis, reductions were below 1% per year for covered sectors. *See* Patrick Bayer & Michaël Aklin, *The European Union Emissions Trading System Reduced CO_2 Emissions Despite Low Prices*, 117 PROC. NAT. ACAD. SCIS. 8804, 8809 (2020). Going forward, the EU ETS cap requires annual reductions of 2.2% per year to 2030. *See* INTERNATIONAL CLIMATE ACTION PARTNERSHIP, EU EMISSIONS TRADING SYSTEM (EU ETS) 3 (2021), *available at* https://perma.cc/S4PT-B5UT. Notwithstanding

no reason to be confident that either emissions trading or a tax could drive rapid decarbonization of the global power sector combined with equally rapid electrification of transportation and other sectors of the global economy. While there are hopeful signs that we are making progress in some countries, such as the U.S., toward a decarbonized power sector, this has resulted from various government mandates and subsidies, combined with the massive decline in natural gas prices, rather than from carbon pricing. More important, even with those mandates and subsidies, the current clean energy transition is not scaling fast enough, and we have barely started the harder process of electrifying transportation and other sectors.

Climate change, of course, is also much more than an energy problem. Any effort to make real, lasting progress in reducing global emissions will also require a fundamental rearrangement of existing patterns of land use and agricultural production, all in the face of rising demand for food and bioenergy and increased climate disruption.[297] As two recent Intergovernmental Panel on Climate Change (IPCC) reports along with unprecedented

problems of surplus allowances, RGGI was designed to achieve annual reductions of 2.5% through 2020. *See* INTERNATIONAL CLIMATE ACTION PARTNERSHIP, USA – REGIONAL GREENHOUSE GAS INITIATIVE (RGGI) 2 (2021), *available at* https://perma.cc/4HUS-72V4. The California cap-and-trade program includes annual declines in the cap of 3.3% per year from 2018-2020 and 4% per year from 2020-2030. *See* INTERNATIONAL CLIMATE ACTION PARTNERSHIP, USA -CALIFORNIA CAP-AND-TRADE PROGRAM 2 (2021), *available at* https://perma.cc/CF3E-RM2H. In the case of carbon taxes, Sweden, which has one of the oldest and highest carbon taxes in the world (currently around $125 per metric ton of CO_2), has seen substantial emissions reductions in the transportation sector, which accounts for about 40% of national emissions. *See, e.g.,* Julius J. Andersson, *Carbon Taxes and CO_2 Emissions: Sweden as a Case Study*, 11 AM. ECON. J. 1, 27 (2019) ("After implementation of a carbon tax and VAT on transport fuels in Sweden, CO_2 emissions from transport declined almost 11 percent in an average year, with 6 percent from the carbon tax alone."). Two points are important to emphasize on the Sweden case. First, Sweden's carbon tax applies almost entirely to transportation and does not cover emissions from much of the rest of the economy. Second, it is more than 60 times higher than the current global average carbon price of $2 per ton of CO_2. *See* Cullenward & Victor, *supra* note 67, at 56–57 (discussing limited sectoral coverage of aggressive carbon taxes such as Sweden's); WORLD BANK GRP., *supra* note 4, at 8 (reporting global average carbon price of US$2 per metric ton of CO_2).

297. *See* IPCC, CLIMATE CHANGE AND LAND: AN IPCC SPECIAL REPORT ON CLIMATE CHANGE, DESERTIFICATION, LAND DEGRADATION, SUSTAINABLE LAND MANAGEMENT, FOOD SECURITY, AND GREENHOUSE GAS FLUXES IN TERRESTRIAL ECOSYSTEMS 79 (2019) (discussing connections between land use and climate change and noting that in the absence of substantial, rapid emissions reductions reliance on large-scale land-based mitigation is expected to increase, which could further exacerbate competition for land, increase food insecurity, and undermine sustainable development goals).

forest fires in California, Australia, Russia, and Brazil have made clear, the land question looms increasingly large in the climate change picture and may well turn out to be the hardest and most important part of the problem.[298]

In sum, these are hardly the kinds of problems that can be solved with the standard tool kit of market-based policy instruments. While harnessing the price system to send signals to investors and consumers alike clearly has a role to play, at best such an undertaking offers a modest tactical approach to a set of deep-seated structural problems that go to the heart of the contemporary world order.[299] Put another way, the current and deepening climate emergency requires a categorically different level of response than simply getting the prices right.

Defenders of these approaches may argue that it is unfair to demand so much from these instruments—that they were never put forward as the single or best solution to the climate change problem. But the record reveals numerous instances stretching over almost thirty years where prominent economists and leading policymakers have advocated carbon pricing in one form or another as the most sensible approach to reducing greenhouse gases and have argued specifically that they should be used instead of other approaches.[300] Indeed, the entire logic of carbon

298. *Id. See also* IPCC, GLOBAL WARMING OF 1.5°C, *supra* note 52, at 462 ("Emerging evidence indicates that future mitigation efforts that would be required to reach stringent climate targets, particularly those associated with carbon dioxide removal (CDR) (e.g., afforestation and reforestation and bioenergy with carbon capture and storage; BECCS), may also impose significant constraints upon poor and vulnerable communities via increased food prices and competition for arable land, land appropriation and dispossession with disproportionate negative impacts upon rural poor and indigenous populations.") On the unprecedented recent fires in California, Australia, Siberia, and the Amazon and their implications for climate policy, see William Boyd, *Deforestation and the Climate Crisis in a Time of Pandemic*, LEGAL PLANET (Apr. 2, 2021), *available at* https://perma.cc/CG5C-N2YL.

299. *Cf.* Clark A. Miller & Paul N. Edwards, *Introduction: The Globalization of Climate Science and Climate Politics*, *in* CHANGING THE ATMOSPHERE: EXPERT KNOWLEDGE AND ENVIRONMENTAL GOVERNANCE 3 (Clark A. Miller & Paul N. Edwards eds., 2001) (observing that climate change represents a "key site in the global transformation of world order").

300. *See, e.g.,* James A. Baker III et al., *The Strategic Case for U.S. Climate Leadership: How Americans Can Win with a Pro-Market Solution*, 99 FOREIGN AFFS. (2020) (arguing for an economy-wide, revenue neutral carbon fee, which would "produce faster and greater emissions reductions at lower cost to the economy than regulations or subsidies). This plan has subsequently been endorsed by a broad coalition of leading companies, several prominent environmental groups, five of the seven oil and gas supermajors, three leading utilities, and a large solar company as well as 3,500

pricing is premised on the notion that other policies should not be allowed to interfere with the workings of the price system.[301]

To be fair, there may have been a time when carbon pricing did represent the best policy option for reducing greenhouse gases. Had the international community been able to muster the courage and commitment to enact and maintain a high carbon price twenty or thirty years ago, perhaps the price system could have worked its magic. Needless to say, we are well past that point today. Given that we now need to reduce emissions globally to close to zero within a few short decades, it seems foolish to bet on carbon pricing as the best tool for the job.

Another way of saying this is that it is time to move beyond the narrow economistic understanding of climate policy that has framed mainstream debates for decades. Thinking about climate change as an economic problem (a problem of market failure) is part of the problem—a symptom of our great derangement.[302] As suggested, such a view turns the problem into one of improper incentives and faulty price signals rather than a broad public problem that requires a sense of ownership and responsibility grounded in a recognition that the climate

economists, the past four chairs of the Federal Reserve, twenty-seven Nobel Laureates, and fifteen former chairs of the President's Council of Economic Advisors. *Id. See also* JOSEPH E. STIGLITZ ET AL., REPORT OF THE HIGH-LEVEL COMMISSION ON CARBON PRICES 9 (2017) ("A well-designed carbon price is an indispensable part of a strategy for reducing emissions in an effective and cost-efficient way.").

301. The leading proposal from the Climate Leadership Council calls for a carbon tax of around $40 per ton starting in 2021 in conjunction with a withdrawal of other policies. *See* https://clcouncil.org. *See also* George P. Schultz & Ted Halstead, *The Winning Conservative Climate Solution*, WASH. POST, (Jan. 16, 2020), *available at* https://perma.cc/GEX4-EMYC ("The winning Republican climate answer is . . . carbon pricing. Just as a market-based solution is the Republican policy of choice on most issues, so should it be on climate change. A well-designed carbon fee checks every box of conservative policy orthodoxy. Not surprisingly, this is the favored option of corporate America and economists—including all former Republican chairs of the president's Council of Economic Advisers.").

302. *See, e.g.*, Lenton et al., *supra* note 41, at 595 ("If damaging tipping cascades can occur and a global tipping point cannot be ruled out, then this is an existential threat to civilization. No amount of economic cost-benefit analysis is going to help us. We need to change our approach to the climate problem."); James K. Galbraith, *Economics and the Climate Catastrophe*, 17 GLOBALIZATIONS 1, 5 (2020) ("It is difficult to see how a discipline whose ideal types are perfect competition, full efficiency, and high levels of substitutability can deal with a problem whose chief features are large scale, wastage, and technological lock-in. Indeed, mainstream economics is, and always has been, an active obstacle to clear thought and effective action on resources, the environment, and climate change."). *See also* AMITAV GHOSH, THE GREAT DERANGEMENT: CLIMATE CHANGE AND THE UNTHINKABLE (2017).

crisis and the inequality crisis are the same crisis. While standard economic tools such as cost-benefit analysis and market-based instruments may be appropriate for standard pollution problems, they are woefully inadequate to understand, frame, and respond to the climate emergency.

This does not mean that we should abandon or dismantle existing cap-and-trade programs or that we should seek to replace other forms of carbon pricing. Obviously, we should make existing programs work as well as possible. In a world of triage and tragic choices, we need to be trying everything we can to reduce greenhouse gases. In the United States, at the federal level in particular, carbon pricing could provide an important source of revenue for a government facing record budget deficits, especially in the aftermath of the COVID-19 pandemic. And at least some of these revenues could be directed to important activities that are harder to manage under other policies or, more importantly, to communities facing loss of income and jobs as a result of the clean energy transition.[303]

But we should not be distracted by the supposed magic of the price system and we should maintain a healthy skepticism toward those who continue to call for carbon pricing as the central pillar of any response to climate change.[304] Given the stakes involved, relying on the price system to build new trillion-dollar industries, secure massive investments in new infrastructure, and retire trillions of dollars of existing assets over the span of a few short decades seems far too risky.[305]

303. *See, e.g.,* Sheldon Whitehouse & James Slevin, *Carbon Pricing Represents the Best Answer to Our Climate Danger*, WASH. POST (March 10, 2020), *available at* https://perma.cc/948X-F4TL (arguing for a carbon price as the "most powerful and efficient way to reduce carbon pollution" and as a critical source of revenue to support a just transition for energy workers and communities).

304. *See, e.g.,* Myles McCormick, *Big Oil Lobbyist Throws Weight Behind Carbon Pricing*, FIN. TIMES (Mar. 25, 2021), *available at* https://perma.cc/X2BJ-C7U4 (reporting that the American Petroleum Institute is endorsing a carbon tax); Ian Parry, *Putting a Price on Pollution: Carbon-Pricing Strategies Could Hold the Key to Meeting the World's Climate Stabilization Goals*, 56 FIN. & DEV. 16 (Dec. 2019) (arguing that carbon pricing should be at the center of global efforts to reduce greenhouse gas emissions); UNFCCC, *supra* note 53.

305. *See* Rosenbloom et al., *supra* note 66, at 8664 ("In order to address the urgency of climate change and to achieve deep decarbonization, climate policy responses need to move beyond market failure reasoning and focus on fundamental changes in existing sociotechnical systems such as energy, mobility, food, and industrial production.").

Proponents of cap-and-trade and carbon pricing will inevitably point to the relative inefficiency of so-called complementary policies and to the tradeoffs involved with any particular course of action. These arguments typically involve comparing the static costs per ton of avoided GHG emissions based on a narrow and highly circumscribed understanding of the different instruments. In virtually all of these analyses, the complementary policies turn out to be more expensive than carbon pricing.[306]

But if we push on these numbers a bit and investigate the ways in which they are calculated, they are shakier than proponents may be willing to admit.[307] Most importantly, these comparisons miss the scale, urgency, and dynamic nature of the challenge. Carbon pricing may indeed be a superior tool when the goal is to make incremental reductions on the margin. But it is the long-term positive spillovers that come with more prescriptive forms of regulation that are crucial in responding to climate change. Mandatory purchase obligations for renewable energy projects starting in the 1980s and reinforced by the Renewable Portfolio Standards of the 1990s and 2000s have created whole new industries in wind and solar in the United States.[308] Direct subsidies and tax credits have reduced the costs of renewable energy projects and allowed them to compete with

306. *See, e.g.*, Kenneth Gillingham & James H. Stock, *The Cost of Reducing Greenhouse Gas Emissions*, 32 J. ECON. PERSPS. 53 (2018) (comparing various cost studies). *See also* David M. Driesen, *Emissions Trading versus Pollution Taxes: Playing Nice with Other Instruments*, 48 ENV'T L. 29, 43–44 (2018) ("The law and economics literature generally seeks to match a single measure to a single environmental problem and seeks to maximize efficiency for that narrow problem. But in practice problems often overlap, and measures that cost-effectively address one risk may exacerbate or ameliorate another.")

307. *See* Gillingham & Stock, *supra* note 306 (distinguishing between static costs and dynamic costs in comparing different approaches to reducing GHGs); Montgomery & Smith, *supra* note 235, at 329–30 (arguing that cap-and-trade and carbon pricing are not appropriate instruments for tackling climate change because of the long timescales over which climate policy must be defined, the need to develop new technologies, and the requirement of a complete changeover of the capital stock to embody those technologies).

308. *See, e.g.*, Jeffrey M Loiter & Vicki Norberg-Bohm, *Technology Policy and Renewable Energy: Public Roles in the Development of New Energy Technologies*, 27 ENERGY POL'Y 85, 90–95 (1999) (discussing federal and state policies, particularly in California, supporting substantial growth in wind energy industry in the 1980s and 1990s); Ryan Wiser et al., *Assessing the Costs and Benefits of US Renewable Portfolio Standards*, 12 ENV'T RES. LETTS. 1, 2 (2017) ("[I]t is clear that a substantial fraction of total renewable electricity supply is serving state RPS mandates.").

fossil fuel based generation..[309] Net metering has led to a boom in rooftop solar.[310] And storage mandates are driving rapid deployment of new grid scale and distributed storage.[311] This may look like industrial policy to some, but if we don't start picking winners soon, we all lose.

On infrastructure, it should be obvious that tweaking the price system is never going to mobilize sufficient investment in high voltage transmission lines, local electricity distribution systems, new electric vehicle charging infrastructure or the electrification of buildings (to name only some of the more obvious challenges) at the scale and pace needed to achieve rapid decarbonization. For that to happen we need to embrace approaches that can drive new investments, guarantee recovery of prudent costs, and accelerate retirement of existing assets.[312] There are lessons here from prior episodes of government mobilization to facilitate dramatic and rapid technological transitions, as well as from more mundane and longstanding models of regulation such as public utility law.[313]

309. *See* Ryan Wiser et al., *Using the Federal Production Tax Credit to Build a Durable Market for Wind Power in the United States,* 20 ELEC. J. 77, 79–80 (2007) (discussing impact of federal production tax credit on wind power costs and deployment in the United States); Stephen Comello et al., *The Road Ahead for Solar PV Power*, 92 REN. & SUST. ENERGY REV. 744, 744–45 (2018) (discussing role of investment tax credit in making solar power cost competitive with other sources of generation and promoting rapid deployment in the United States).

310. *See* Sanem Sergici et al., *Quantifying Net Energy Metering Subsidies*, 32 ELEC. J. 1, 1 (2019) (noting the effectiveness of net metering policies in promoting the rapid growth of distributed solar). As this study and various others have also noted, net energy metering also results in substantial cross subsidies from customers without distributed generation, often poorer customers, to those with distributed generation, often wealthier customers. *See id.* at 4 (concluding that net energy metering leads to substantial subsidies from non-distributed generation to customers with distributed generation).

311. *See* Jeremy Twitchell, A *Review of State-Level Policies on Electrical Energy Storage*, 6 CURRENT SUST. REN. ENERGY REP. 35, 40 (2019) (identifying state storage mandates and policies as key factor driving substantial growth in deployment of storage since 2010).

312. *Cf.* William Boyd, *Public Utility and the Low Carbon Future*, 61 UCLA L. REV. 1614, 1683 (2014) ("Mobilizing and channeling the investments in generation, transmission, distribution, and end use needed to reduce emissions across the power sector by 80 percent or more by midcentury will require a level of certainty regarding cost recovery that markets along seem unable to provide.").

313. *Id. See also* NATIONAL RESEARCH COUNCIL, FUNDING A REVOLUTION: GOVERNMENT SUPPORT FOR COMPUTING RESEARCH 1–14 (1999) (describing the wide ranging and fundamental role that federal investment and support played in launching and sustaining the "computer revolution").

Put simply, and at the risk of provoking yet another round in the three-decade long assault on "command-and-control" regulation, it is past time for market enthusiasts to recognize that planning, government mandates, state-directed investment, industrial policy, public works, and prescriptive regulations have a much more critical role to play (and already are playing such a role in some cases) than price-based approaches in driving the clean energy transition and facilitating the deep structural changes in the global agro-food system needed to combat climate change.[314] While these approaches may seem anathema in our neoliberal age and contrary to decades of mainstream thinking in environmental policy circles, given the stakes involved with climate disruption, we no longer have the time or the luxury to debate the finer points and compare the relative efficiencies of a set of tools that were developed in other times and places with other, more manageable problems in mind.

More importantly, whatever the specific mix of policies, it is clear that we need a more robust and expansive state to confront the climate crisis in a meaningful way. Market instruments and appeals to individual behavior may encourage reductions on the margin, but they will not drive the kind of structural change that deep decarbonization requires.[315] Without a strong and capable state able to mobilize across multiple domains, any such effort at deep decarbonization will almost surely fail. In addition to focusing on the many policies and programs that will be necessary to rapidly decarbonize our economies, therefore, we also need to turn our attention back to the state itself and its capacity to drive such change.

314. *See, e.g.,* DAVID G. VICTOR ET AL., ACCELERATING THE LOW CARBON TRANSITION: THE CASE FOR STRONGER, MORE TARGETED AND COORDINATED INTERNATIONAL ACTION 51 (2019) ("Whereas previously it might have been assumed that putting a price on carbon emissions and making them tradeable offered the most efficient way to reduce emissions, it is now increasingly recognised that most progress so far has been achieved through targeted investments in low carbon technologies.").

315. *See, e.g.,* Driesen, *Limits of Carbon Pricing, supra* note 5, at 117 ("Pricing favours incremental improvements over investments in the most promising technologies for getting to zero emissions across the economy."); Rosenbloom et al., *supra* note 66, at 8665 ("Addressing the climate challenge . . . involves fundamental changes to existing systems, referred to as 'sustainability transitions.' These transitions entail profound and interdependent adjustments in socio-technical systems that cannot be reduced to a single driver, such as shifts in relative market prices.")

It is possible that the current conjuncture provides a once-in-a generation opening to rethink the state and its role in responding to complex problems such as climate change. As we confront the economic wreckage of the COVID-19 pandemic and its compounding effects on structural inequality and systemic racism, various governments around the world have embraced the notion of a "green stimulus"—a set of interventions that seeks to rebuild the economy through sustained investment in clean energy and a green economy. The logic of these proposals is obvious: if we are going to spend trillions of dollars rebuilding our economies, why not do so in a manner that accelerates decarbonization and prepares for climate disruption? The convergence of climate and economic policy that these proposals embody represents an encouraging step toward reimagining what a broad-based response to climate change might look like.

But these interventions are also important for another reason. In addition to rebuilding the economy, they could also be critical in rebuilding governments that have been hollowed out, diminished, and distorted by decades of neoliberal policies. This is especially true in countries such as the U.S. and the U.K. that have spent almost half a century outsourcing and privatizing key government functions.[316] Viewed in this way, the climate emergency, together with other crises such as the pandemic and structural inequality, may offer the last best chance we have to remake the state—to recognize that state capacity is a fragile resource that has to be built (and rebuilt) in the process of solving genuine public problems.

V. CONCLUSION

In 1986, Ronald Reagan famously remarked that the nine most terrifying words in the English language are: "I'm from the Government, and I'm here to help."[317] With his cynical dismissal

316. *See, e.g.*, JON MICHAELS, CONSTITUTIONAL COUP: PRIVATIZATION'S THREAT TO THE AMERICAN REPUBLIC (2017); JAMES MEEKS, PRIVATE ISLAND: WHY BRITAIN NOW BELONGS TO SOMEONE ELSE (2015).

317. *See Reagan Quotes and Speeches*, REAGAN FOUNDATION, *available at* https://perma.cc/C69G-6ZA8. It is, of course, important to note that Democrats going back to President Jimmy Carter have likewise embraced the view that government's role in solving problems is limited. *See, e.g.*, LERMAN, *supra* note 282, at 27 (discussing President Carter's views on limited government). Presidents Clinton and Obama also embraced, perhaps out of necessity, a diminished view of government.

of government, President Reagan tapped into a deep-seated desire to blame someone or something for the malaise of the 1970s. Regulation was an obvious target and over the course of the 1980s, as Reagan vigorously pursued a deregulatory agenda, the very idea that the state could be harnessed to solve complex problems was called into question.

It is no coincidence that market-based instruments such as emissions trading came of age in the 1980s. The "rediscovery of the market" and its increasing abstraction from institutions and politics provided the animating force behind efforts to reform environmental law.[318] Although much of this agenda was framed as an advance over the clunky and inefficient approaches of the 1970s, there was, lurking just below the surface, a severely diminished view of government.

Today, we are in the early stages of a long-term, sustained climate emergency that will last generations. The scale of human suffering that we can expect to witness and the injustices that will be visited upon those who have done nothing to create the problem are staggering. Needless to say, the tools we have developed over the last half century to respond to environmental problems appear wholly inadequate in the face of such an emergency. And yet we continue to recycle many of the same old arguments in favor of a narrow, instrument-based approach that fails to recognize that this is a problem that goes to the heart of the contemporary world order. Environmental law, it seems, has lost its way in confronting the climate crisis.

When it comes to planetary survival, clever arguments about the reciprocal nature of harm or the relative efficiency of market-based policies seem hollow, even callous. The relentless promotion of markets and competition in virtually every sphere of society over the last half century has left us in an intellectual cul de sac. As with much of our politics, our thinking about climate change often seems trapped in a reflexive skepticism toward the state and a widespread denial of the possibility of any coherent notion of the public interest. While it is obviously too early to tell whether the COVID-19 pandemic will restore our faith in government, not to mention facts and expertise, it is clear that climate politics desperately needs such a change.

318. *See* RODGERS, *supra* note 278.

It is here that the proponents of the Green New Deal are on to something vital and important. They recognize that any serious response to climate change will require building whole new industries and a massive re-organization of how we live together. In their view, this must be based on bold programs of government intervention on a scale that we have not seen in the United States since the first New Deal. Criticizing them for lacking detailed plans misses their broader normative project of resuscitating a view of government that has been under attack for decades and that has been sidelined in much of the climate policy discussion by narrow, technocratic questions of instrument choice.

While recent announcements by major corporations and the financial sector signal a new awareness of the problem and the possibility of meaningful action by private firms to channel capital and economic activity into less destructive pursuits, this is not a problem that can be solved by private environmental governance. Davos will not save us. Nor will perennial appeals to reduce our individual carbon footprints—appeals that have been pushed by the fossil fuel companies as a way to turn a systemic problem into one of individual responsibility.[319]

Inevitably, discussions about major government interventions lead to concerns that we will end up confronting "a new climate leviathan" and the prospect of seemingly permanent states of emergency.[320] No doubt the accelerating impacts of climate disruption bring with them the possibility of more authoritarian forms of government. And there are plenty of signs that the climate crisis will further strain the limited capacity for mercy in many countries, not to mention the ability of democratic institutions to respond.

But this is all the more reason to reframe the climate change challenge as a broad, public problem that requires political mobilization and government action at every level. Rather than doubling down on a half century of neoliberal hostility to regulation, it seems well past time to embrace and, more

319. *See* Meehan Crist, *Is it OK to Have a Child?* 42 LONDON REV. BOOKS (Mar. 5, 2020), *available at* https://perma.cc/NRR2-V4LN (discussing BP's efforts to popularize the idea of a personal carbon footprint in the mid-2000s as a way of "deflecting responsibility for combatting climate change onto the individual consumer").

320. *See* GEOFF MANN & JOEL WAINWRIGHT, CLIMATE LEVIATHAN: A POLITICAL THEORY OF OUR PLANETARY FUTURE (2018).

importantly, to work to realize a view of government as responsive and capable of solving complex *public* problems. Whether new publics will continue to take shape and be receptive to such a move and whether such openness will in turn translate into real political agency are surely among the most pressing questions confronting climate politics today. But I dare say that many people now facing loss of life, livelihood, and property brought on by climate disruption would no longer agree with Ronald Reagan's gratuitous dismissal of government. The great challenge looming before us is to rebuild our government and restore lost confidence—to make it possible, even likely, that in the coming years the phrase "I'm from the government, and I'm here to help" will be received as welcome words in a world facing unprecedented destruction and loss.