

TIMING AND FORM OF FEDERAL REGULATION:
THE CASE OF CLIMATE CHANGE

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INTRODUCTION

In this Article, we use a case study of climate regulation as a window into the process by which federal regulation takes shape. Regulation in response to climate change is a good example—perhaps the best in recent years—of states assuming a leadership role to address a social problem while the federal government remains inert. What are the likely effects of such state activity on the prospects for a federal response? Can states, by regulating, affect the likelihood that Congress will pass a federal statute to address a problem it has been ignoring? If so, by what mechanism does this occur? Can states affect not only the likelihood but the form of federal regulation—that is, the particular policy tools that Congress will adopt to address the regulatory problem? To date, these questions have been addressed only indirectly, if at all, in the relevant legal scholarship.

We argue here that states can be important catalysts of a federal policy response by stimulating both pro-regulatory and anti-regulatory forces to appeal to the federal government for relief sooner rather than later. To explain this phenomenon we piece together and build on insights from two literatures: the environmental federalism scholarship, which predicts when environmentalists and state and local governments will appeal for federal regulatory floors to prevent a race to the bottom, and when states will do so to overcome interstate externalities (ISEs); and what we have labeled “defensive preemption theory” (DPT), which predicts when industry will seek federal regulatory ceilings. We show how, consistent with DPT, state regulation addressing climate change has prompted industry to seek uniform and preemptive federal regulation. In addition, we show that although the traditional assumptions of race-to-the-bottom theory (RBT) and ISE theory do not apply to climate change (and thus do not generate demand for federal regulation), state regulatory measures nevertheless leave pro-regulation forces unsatisfied and drive them to Congress for relief. Thus, state regulation aimed at climate change has produced a convergence of interest group support for federal intervention—what we call “hitting the regulatory sweet spot.”

Yet this analysis only takes us so far: although it helps to explain the timing of climate change regulation, it says nothing about its form. To shed light on this related question, we identify and explore the impact of three influential factors: the end goals of the dominant interest groups, the properties of the specific regulatory problem, and the compatibility of the available regulatory tools with potential targets of regulation.¹ Our goal is not to develop a formal predictive model of all forms of federal legislation. More modestly, we carefully explain the role these three factors have played in shaping interest group demand for federal climate change policy. In particular, we explain why U.S. climate legislation is likely to soon contain a cap-and-trade regime. More generally, however, these three factors are likely to be influential in determining the form of regulation in other contexts, even if they are not perfectly predictive.

The climate change example is particularly instructive on the questions of both timing and form for three reasons. First, it offers a contemporary illustration of state regulatory liveliness in the face of federal malaise—a dynamic that has been noted by many scholars, but has not yet been fully explored for what it can teach us more generally about the determinants of federal regulation.² Regulatory responses to climate change have occurred in an especially complex and rich in-

¹ This inquiry into form in some ways parallels Ackerman and Hassler's account of the standards for new sources of sulfur oxides in the Clean Air Act amendments of 1977. See BRUCE A. ACKERMAN & WILLIAM T. HASSLER, *CLEAN COAL/DIRTY AIR* 44-55 (1981). Like them, we explore how interest group politics interact with the nature of a given environmental problem and the available technological solutions to determine instrument choice. Yet unlike their case study, in which the interests of the relevant constituencies led to a socially inefficient result, our account results in the choice of an arguably superior policy instrument.

² The proliferation of state climate change initiatives has provided an opportunity to reflect on old debates in environmental federalism about whether states will inevitably race to the bottom or whether they will sometimes race to the top. See, e.g., BARRY G. RABE, PEW CTR. ON GLOBAL CLIMATE CHANGE, *RACE TO THE TOP: THE EXPANDING ROLE OF U.S. STATE RENEWABLE PORTFOLIO STANDARDS 1* (2006), <http://www.pewclimate.org/docUploads/RPSReportFinal%2Epdf> ("For generations, scholars have debated intensively whether states would be more likely to 'race to the top' or 'race to the bottom' in the absence of guiding federal commands."). Many scholars treat the state initiatives as a puzzle that must be explained. That is, why are states taking potentially costly steps to control greenhouse gas (GHG) emissions, especially since global warming pollution is a classic "public bad" that they cannot fix on their own? See, e.g., Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 *WAKE FOREST L. REV.* 719, 778-86 (2006) (reviewing reasons for and examples of state activism). Others tout the state initiatives as "dynamic federalism" at work. E.g., Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 *EMORY L.J.* 159, 177-84 (2006).

terest group setting. The regulatory burden of addressing climate change will fall most heavily on the transportation and electric power sectors, since they are responsible for most domestic greenhouse gas (GHG) pollution, but will also encompass many other sectors, including manufacturing. Thus, regulation in response to climate change will deeply affect the American economy. In regulatory terms, this is a major event.

Second, climate change differs in important ways from other, more traditional, environmental harms; its uniqueness helps to explain why we see a surprising convergence of interest group support for a particular form of federal regulation. Specifically, since climate change involves a “stock” pollutant without significant localized effects, environmentalists are more supportive than usual of using market-based regulatory instruments like emissions trading to address it. This support, combined with industry’s traditional preference for cost-minimizing regulatory mechanisms, goes a long way toward explaining the nature of the federal policy response.

Third, the type of regulatory challenge presented by climate change, while momentarily unique, may also be a sign of things to come—we may increasingly confront environmental harms with serious, but less localized, effects.³ If so, environmental regulation may be necessary to address such harms. Explaining the form such regulation is likely to take requires a deeper understanding of interest group politics regarding stock pollutants.

Such an inquiry is the project of this Article. Part I describes and adds to the current understanding of how states motivate federal environmental legislation, focusing on the most common explanations of this phenomenon: RBT, ISEs, and DPT. Part II provides a case study of climate change legislation, discussing in detail the actions states have taken, and how these actions might affect the timing and form of a federal response. Part III focuses on the factors that will affect the form of federal legislation, which are mostly independent of state regulatory activity. Taken together, the Article thus adds to our understanding of both the timing and the form of federal environmental legislation.

³ On both a global and a regional scale, such pollutants are likely to emerge in our common property resources like the atmosphere, the oceans, and the biological populations that make up our ecosystems.

I. STATES AS INCREMENTAL CATALYSTS

A. *Federal Floors*

One of the longest-standing and most important debates in environmental law concerns the desirability of federal minimum standards. Scholars have offered a number of justifications for establishing federal floors: states do a relatively poor job compared to Congress of protecting the environment; there are economies of scale to be gained from addressing problems at the national level; federal minimum standards are necessary to address interstate spillovers; and, left to their own devices, states will compete to attract industry by cutting their environmental standards, creating a race to the bottom.⁴ Each of these hypotheses has been challenged in recent years, triggering a renewed effort to explain and justify the federal government's lead role in environmental regulation. Perhaps the most vociferous debate has been over whether the race-to-the-bottom hypothesis is accurate and, if it is, whether the consequences of such competition are undesirable.⁵

Although the environmental federalism literature is primarily concerned with the normative question of the optimal level of regulation (state or federal), it also offers an implicit positive account of at least two conditions under which we would expect to see states driving interest group demand for federal minimum standards. First, the threat of an interstate deregulatory competition—the so-called race to the bottom—could motivate environmentalists and state and local officials to seek federal minimums. Second, the migration of pollution from one state to another—that is, ISEs—might move state and local officials to seek a federal solution to a problem they cannot overcome

⁴ Peter P. Swire, *The Race to Laxity and the Race to Undesirability: Explaining Failures in Competition Among Jurisdictions in Environmental Law*, 14 YALE L. & POL'Y REV. (SYMPOSIUM ISSUE) 67, 68, 107-09 (1996).

⁵ See, e.g., Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race-to-the-Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210, 1211-12 (1992) (challenging the "accepted wisdom" that a race to the bottom "decreases social welfare," and arguing that "such competition can be expected to produce an efficient allocation of industrial activity among the states"); Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is It "to the Bottom"?*, 48 HASTINGS L.J. 271, 375 (1997) (concluding that there is an undesirable race to the bottom in state environmental regulation); Richard L. Revesz, *The Race to the Bottom and Federal Environmental Regulation: A Response to Critics*, 82 MINN. L. REV. 535, 536-40 (1997) (responding to, among others, Engel's and Swire's critiques of his argument that a race to the bottom is not undesirable).

on their own. In both cases, state activity helps to create a demand for federal minimum standards in order to pull laggard states up.

These two rationales for federal minimums help to explain the genesis of early federal environmental regulation. For example, state and local governments in highly polluted states led the charge for federal minimum air quality standards because they felt pressure to respond to voter demand for air pollution regulation, yet feared a race to the bottom.⁶ Although neither the RBT nor the ISE rationale can fully account for why environmental regulation emerged at the federal level in the early 1970s,⁷ they shed some light on how state behavior can influence the demand for federal standards.

B. *Defensive Preemption and Federal Ceilings*

States can also induce industry demand for federal regulation. Over twenty years ago, Elliott, Ackerman, and Millian noted that inconsistent state regulation could prompt industry to lobby for uniform federal regulation.⁸ To support this claim, the authors cited the first significant federal air pollution laws, which, they argued, were partly the result of the automobile and soft coal industries seeking uniform

⁶ Indeed, environmental groups had very little to do with generating the first significant air pollution legislation. See CHRISTOPHER J. BAILEY, CONGRESS AND AIR POLLUTION 109 (1998) (“Notable by their absence in this period of policy awakening are national environmental interest groups.”). According to at least one account, most of the pressure for federal legislation came from groups of local officials, including the U.S. Conference of Mayors, the American Municipal Association, and the National Association of Counties, which felt pressure from voters to act, but lacked resources to act themselves and remained concerned about disadvantages to their jurisdictions caused by a race to the bottom. *Id.* at 104-05. Early congressional leadership on pollution came especially from members of Congress from California, where terrible air pollution and significant voter concern finally altered the political cost-benefit calculus for legislators, tilting it in favor of action. *Id.* at 91-92. Yet over time, environmental groups began pressing for federal minimums as well. See *id.* at 118 (noting that, in the period from 1964 to 1970, “growing public awareness of environmental problems generated ever greater demands for further action, and spawned a new generation of interest groups willing to put pressure on Congress to take further action”).

⁷ Richard B. Stewart, *Environmental Quality as a National Good in a Federal State*, 1997 U. CHI. LEGAL F. 199, 210 (explaining the dominance of federal environmental regulation in these terms: “I think we must simply conclude, as a matter of fact, that many Americans regard environmental quality as an important national good that transcends individual or local interest.”).

⁸ E. Donald Elliott, Bruce A. Ackerman & John C. Millian, *Toward a Theory of Statutory Evolution: The Federalization of Environmental Law*, 1 J.L. ECON. & ORG. 313, 326 (1985).

preemptive federal standards when faced with the threat of inconsistent and increasingly rigorous state laws.⁹

Elliott and his coauthors made this point in the context of a larger argument that sought to debunk prevailing myths about the origins of federal statutes, namely that they are either the product of a well-intentioned Congress seeking to solve policy problems, or the result of conventional interest group politics in which environmentalists successfully pressure the national government for legislation.¹⁰ To properly understand federal statutes, the authors argued, one must recognize that they are the product of organizational and political exigencies¹¹ (a position that we, of course, embrace). Under this “evolutionary” model of federal statutes, state-level legislative successes by environmental groups tend to be countered by federal legislative successes by industry groups.¹² This insight was the genesis of DPT. Since then, others have identified additional examples of this phenomenon, although no one has elaborated on it in any depth.¹³

The Elliott et al. account of industry demand for federal legislation provides an important piece of the puzzle of how federal statutes take shape. First, it disabuses us of the notion that industry will always resist regulation. Indeed, industry groups sometimes provide the impetus for regulation, in both domestic and international settings.¹⁴ Al-

⁹ *Id.* at 326, 330-33. See also Kirsten H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 *ECOLOGY L.Q.* 183, 223-26 (2005) (echoing this argument and explaining how state regulation can have a “domino effect” by prompting industry to seek preemption).

¹⁰ Elliott et al., *supra* note 8, at 314.

¹¹ *Id.* at 315.

¹² *Id.* at 316.

¹³ See, e.g., Stewart, *supra* note 7, at 200-01 (citing industry support of the Clean Air Act and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), but noting that this “[a]ffirmative industry support for major new federal regulatory initiatives is rare”).

¹⁴ Regulated industries sometimes support uniformity of regulatory standards, even at a higher level of regulation, to ensure a level playing field. For example, stringent regulations at the national level may lead industry in highly regulated nations to push for stringent international standards to protect them from being undercut by competitors in nations with less stringent regulations. See Jonathan Baert Wiener, *On the Political Economy of Global Environmental Regulation*, 87 *GEO. L.J.* 749, 763 (1999) (positing that market forces may motivate a move toward “multilateral regulatory regimes that harmonize standards upward”). For example, the chemical industry responded to unilateral domestic restrictions on chlorofluorocarbons (which damage the ozone layer) by supporting international harmonization to “level the playing field” among competitors. Susan Rose-Ackerman, *Environmental Policy and Federal Structure: A Comparison of the United States and Germany*, 47 *VAND. L. REV.* 1587, 1617-18 (1994). “[This] case is an example of how national regulation of a global problem, while inef-

though industry may lead the charge for federal legislation only infrequently, industry support for federal regulation undoubtedly has a powerful effect on the prospect of its passage.¹⁵

Yet what will industry demand from Congress? It will demand a federal standard that preempts inconsistent state regulation and eliminates regulatory uncertainty. Uniformity is not enough, however. Industry will also try to undercut the most aggressive state standards by seeking a lower federal ceiling.¹⁶ States thus establish the boundaries within which the federal negotiation over standards takes place—the more stringently states regulate at the outset, the more leverage they create for a compromise in the end. If the federal standard turns out to be weaker than the most aggressive state standard, and if preemption prevents any deviation, then industry achieves a double win.¹⁷

Second, the Elliott et al. thesis implicitly suggests that states can have a significant impact on the likelihood of federal regulation because states can do more (or less) to prompt industry demand for a federal response.¹⁸ When are states most likely to provoke industry?

fective as a long-term strategy, can turn opponents of regulation into political allies.” *Id.* at 1618. On the pursuit of harmonized standards generally, see DAVID VOGEL, *TRADING UP: CONSUMER AND ENVIRONMENTAL REGULATION IN A GLOBAL ECONOMY* 248-70 (1995) (describing the “California effect” of upward harmonization in the context of trade regulation), and Daniel C. Esty & Damien Geradin, *Market Access, Competitiveness, and Harmonization: Environmental Protection in Regional Trade Agreements*, 21 *HARV. ENVTL. L. REV.* 265, 282-94 (1997) (discussing harmonization in the international context).

¹⁵ See Stewart, *supra* note 7, at 200-01 (noting elements of certain legislation that benefited from industry support).

¹⁶ In most cases we expect the ultimate federal standard to be a compromise—not as lenient as the weakest state standard, but not as stringent as the most demanding standard. Since uniformity creates the maximum amount of certainty for regulated entities, however, industry may be willing to trade leniency for uniformity. And sometimes industry miscalculates and Congress passes a surprisingly stringent standard. See Rose-Ackerman, *supra* note 14, at 1618 n.122 (“California passed a law stringently regulating automobile exhaust. As a consequence, the automobile industry began to support preemptive federal legislation. Similar to the case of [chlorofluorocarbon regulation], however, the subsequent federal law was so strict as to cast doubt on the wisdom of the industry’s strategy.”).

¹⁷ “Because federal preemption eliminates state regulatory burdens, preemption rulings [by courts] have a tendency . . . to minimize the regulatory requirements to which businesses are subject.” Richard H. Fallon, Jr., *The “Conservative” Paths of the Rehnquist Court’s Federalism Decisions*, 69 *U. CHI. L. REV.* 429, 471 (2002). So too, presumably, would preemptive *legislation* tend to benefit regulated industry.

¹⁸ Although many scholars have cited this thesis, none have fully explained how a state’s choice of regulatory measures can hasten or intensify industry demand for a federal response. At the time of writing, almost all articles in Westlaw’s Journals and Law Reviews database cite Elliott and his coauthors for the proposition that industry

When they regulate *products*, as opposed to *end-of-pipe pollution*.¹⁹ We base this claim not only on ad hoc observations made in the environmental federalism literature,²⁰ but on an argument that is frequently made in the preemption scholarship—that the economic case for preemption is strongest when states engage in product regulation that is likely to interfere with the smooth functioning of the national market.²¹ The natural inference is that industry is likely to be especially

may lobby for federal regulation if it fears a proliferation of inconsistent state laws. Yet none offer significant elaboration. For a slightly more extended discussion of appeals for preemptive regulation by interest groups and industry, see Engel & Saleska, *supra* note 9, at 224-28. See also Stewart, *supra* note 7, at 200-01 (citing regulation of pesticide labeling under FIFRA as an example of industry-driven preemption of inconsistent state regulation). Stewart notes that “[s]uch instances of preemptive federal regulation may be understood as industry efforts to head off a ‘race to the top’ in which states with large markets adopt stringent environmental regulations for products, where a substantial portion of the burden of such regulations is borne by out-of-state interests.” *Id.* at 201 n.13. But see Swire, *supra* note 4, at 86-87 (arguing that “races to the top” will be rare).

¹⁹ By “end-of-pipe” we mean regulation through performance standards aimed at reducing emissions, rather than design standards that dictate how a product must be made. Other scholars have referred to the distinction between “process” and “product” regulation, but in different contexts and using slightly different definitions. See, e.g., Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570, 618 (1996) (arguing that regulation of products rather than processes “can create important economies of scale” for industry); Richard L. Revesz, *Federalism and Environmental Regulation: Lessons for the European Union and the International Community*, 83 VA. L. REV. 1331, 1334-35 (1997) (discussing the different incentives created by process and product standards).

²⁰ See, e.g., Stewart, *supra* note 7, at 200 (noting only a “few instances of industry support for preemptive federal regulation of nationally marketed products”).

²¹ Referring to product safety regulation and federal preemption of state common law claims for products liability, Alan Schwartz makes a point that applies equally in our context:

Uniformity reduces costs because there commonly are economies of scale to production. As a consequence, when firms are required to produce different versions of a product to comply with different state safety standards, each item will be more expensive than it would otherwise have been, and some items may not be produced at all.

Alan Schwartz, *Statutory Interpretation, Capture, and Tort Law: The Regulatory Compliance Defense*, 2 AM. L. & ECON. REV. 1, 17 (2000). Uniform markets are a priority for courts as well. See Samuel Issacharoff & Catherine M. Sharkey, *Backdoor Federalization*, 53 UCLA L. REV. 1353, 1390, 1413 (2006) (arguing that the rise of federal preemption of state law, together with the expansion of the federal forum through federal question subject matter jurisdiction, amounts to a concerted effort by the Supreme Court to protect uniform national markets from state-created externalities).

sensitive to regulations that require different products for different markets,²² and the empirical evidence bears this out.²³

Where, by contrast, a state merely regulates “end-of-pipe” pollution by establishing standards that permit flexible compliance (perhaps by allowing installation of technology at a local facility, fuel switching, or other strategies), industry may not be as moved to seek a federal preemptive solution. The affected industry might instead choose to bear these costs locally, or might relocate to a more favorable jurisdiction (consistent with the race-to-the-bottom hypothesis). In the end, of course, the calculation comes down to cost: where a

²² This is not to suggest that product regulation is the *only* thing that can prompt industry to seek preemption, just that it may be especially likely to do so. Indeed, there is ample evidence that industry seeks preemption simply to undercut rigorous state regulation even in the absence of product regulation. For example, the petrochemical industry ultimately supported the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, the federal hazardous waste cleanup law) after years of opposing it, in part out of a desire to preempt disparate and increasingly rigorous state taxes. In *Exxon Corp. v. Hunt*, 475 U.S. 355, 372 (1986), the Court noted, “It seems clear that the decision to enact a pre-emption provision resulted in part from Congress’ concern about the potentially adverse effects of overtaxation on the competitiveness of the American petrochemical industry.” Industry did not, in the end, succeed, since Congress ultimately reversed *Hunt*’s holding, 475 U.S. at 370-71, that CERCLA preempts state taxation to fund cleanup efforts that could be compensated under CERCLA. See Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, § 114, 100 Stat. 1613, 1652 (codified at 42 U.S.C. § 9614(c) (2000)) (repealing the provision of CERCLA at issue in *Hunt*).

²³ For example, auto manufacturers have long complained that state regulation of tailpipe emissions would be burdensome because it would require them to design different cars for different markets. See *infra* text accompanying notes 35-41; see also Motor Vehicle Mfrs. Ass’n v. N.Y. State Dep’t of Envtl. Conservation, 869 F. Supp. 1012, 1015-16 (N.D.N.Y. 1994) (discussing why California’s regulations on zero-emission vehicles, which New York sought to adopt, did not require manufacturers to produce a “third vehicle” as they had claimed), *aff’d*, 79 F.3d 1298 (2d Cir. 1996); Jim Marzilli, *Laboratories of Progress*, AM. PROSPECT, Oct. 2005, at A13, A13-A14 (predicting that, with several states having adopted or considering adopting California’s approach to regulating tailpipe emissions, “the auto industry will find it increasingly difficult to maintain two product lines for each vehicle it manufactures”). Disputes between different industry groups over the need for federal legislation also bear this out. For example, when Congress was debating the Air Quality Act of 1967, producers of coal supported preemptive federal legislation because of proliferating and conflicting state standards, see BAILEY, *supra* note 6, at 128-29, but other industries, whose pollution was generated primarily by their processes as opposed to their products, opposed federal regulation, see *id.* at 131-32, 149. More broadly, we would expect demands for federal preemption from any industry that provides regional or national products that are costly to differentiate. For example, electricity providers that serve more than one state, if subject to inconsistent state regulatory regimes, might have to tailor their fuel inputs to the requirements of different markets, making GHG regulation akin to product regulation for this industry.

regulation allows for flexibility in compliance, firms are better able to find least-cost solutions.

As a result, industry should be more willing to tolerate diverse and inconsistent state regulation in three situations: (1) when the regulation allows for flexible means of compliance, thereby obviating the need to tailor products to different markets; (2) when tailoring is necessary but can be done at relatively low cost; or (3) when the product that requires alteration is limited to local markets. Whether or not industry appeals to the federal government thus depends to some extent on the nature of the initial state regulation, especially the cost of compliance. This theory of industry incentives also helps to explain why different industries in different sectors of the economy—manufacturing, transportation, electric power, electronics, etc.—might respond with greater or lesser degrees of alarm to inconsistent state regulation.²⁴ Generally, however, states can increase the chances that industry will appeal to the federal government by engaging specifically in product regulation.

Industry pressure for a federal standard may also mount when regulatory uncertainty, induced or exacerbated by inconsistent state activity, produces significant costs, even in the absence of direct product regulation.²⁵ This is more likely to be the case when firms are pre-

²⁴ Throughout this Article we use the term “industry” broadly, to include diverse firms in different sectors of the economy. Yet clearly there are important differences between firms that help to explain their different reactions to the prospect of federal regulation, including how they are positioned in terms of their ability to adapt to regulation and how they will fare relative to their competitors. In the climate context, for example, electricity generators are likely to be one of the main targets of any GHG reduction program because electricity generation is responsible for approximately 33% of domestic emissions. See U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2005, DRAFT FOR PUBLIC REVIEW, at ES-14 (2007), available at <http://www.epa.gov/climatechange/emissions/downloads07/07CR.pdf>. Compared to high-technology firms and other low-energy manufacturers, energy-intensive industries (such as oil refineries and manufacturers of products like cement) are likely to be hit harder by regulation. Moreover, even within a single industry there are important differences among individual firms. For example, PG&E, which provides electricity exclusively to California and is the state’s largest utility, tends to produce fewer GHG emissions per unit of energy than other electricity providers because it uses relatively more natural gas and hydropower, which are cleaner fuel inputs. This means PG&E is well positioned to adapt to GHG regulation relative to other firms within the same industry, and helps to explain the firm’s early and vocal support for both state regulation and a mandatory national program. See Jad Mouawad & Jeremy W. Peters, *California Plan To Cut Gases Splits Industry*, N.Y. TIMES, Sept. 1, 2006, at C1.

²⁵ See AVINASH K. DIXIT & ROBERT S. PINDYCK, INVESTMENT UNDER UNCERTAINTY 309 (1994).

paring to make substantial long-term capital investments in the context of confusion about the short-term regulatory playing field.²⁶ This uncertainty is likely to be especially pronounced when it arises simultaneously at the state, national, and international levels. With so much in flux and so much at stake, both domestic and multinational firms will want clarity sooner rather than later.

States can increase regulatory uncertainty in this way either by taking action alone or by joining together with other states in regional compacts. Moreover, because states will be responding to somewhat different interest group configurations within their own jurisdictions, there is a high likelihood that different states will adopt different regulatory approaches. This practically ensures inconsistency and helps drive industry to Congress. At the same time, some states are likely to be more important than others in provoking this reaction. Historically, California seems to have been especially influential in prompting industry demand for federal uniformity, perhaps because of the state's disproportionate market power²⁷ and history of engaging in product regulation targeting automobiles.²⁸

We emphasize that both of the precipitating factors discussed so far—product regulation specifically and regulatory uncertainty generally—are factors that states can affect through their initial decision to regulate and through their choice of which regulatory approaches to adopt. Moreover, states presumably can build additional demand for federal regulation by motivating the industries that benefit from state regulation (e.g., substitute products industries²⁹) to appeal to Con-

²⁶ See Andrew P. Morriss, Bruce Yandle & Andrew Dorchak, *Choosing How To Regulate*, 29 HARV. ENVTL. L. REV. 179, 228 (2005) (“[F]irms with long lead times and large capital costs are more vulnerable to the costs of regulatory uncertainty than are firms with shorter lead times and smaller capital costs.”); Elizabeth Olmsted Teisberg, *Capital Investment Strategies Under Uncertain Regulation*, 24 RAND J. ECON. 591, 593 (1993) (“[L]arge capital investments are irreversible . . . so uncertainty about future regulatory outcomes exposes . . . firm[s] to significant risk.”).

²⁷ The gross domestic product of California is larger than that of any other state at \$1622 billion (in 2005 dollars). See 2006 CAL. STATISTICAL ABSTRACT 73 tbl.D-2, available at http://www.dof.ca.gov/HTML/FS_DATA/STAT-ABS/2006_statisticalabstract.pdf; Bureau of Econ. Analysis, Gross Domestic Product by State, <http://www.bea.gov/regional/gsp> (last visited May 1, 2007).

²⁸ See *infra* notes 35-41 and accompanying text.

²⁹ See Engel & Saleska, *supra* note 9, at 231 (noting that the alternative fuel industry has much to gain from federal regulation of high carbon fuels); see also Cal. Exec. Order No. S-01-07 (Jan. 18, 2007), available at <http://gov.ca.gov/index.php?/executive-order/5172> (ordering that “a statewide goal be established to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020”).

gress for additional financial transfers. Firms that are in a position to benefit from regulation always can be expected to lobby for rents; state regulation could prime them to do so at the federal level. Such firms might seek federal action either to lock in or to build on gains achieved through state regulation. This is likely to happen in at least three circumstances: (1) when federal regulation can deliver more of the same kinds of benefits; (2) when federal regulation can lock in benefits gained at the state level; and (3) when some of the anticipated benefits of the state initiatives are at least partly contingent on federal regulation.³⁰

There is strong empirical evidence to support the predictions of DPT.³¹ First, many environmental statutes do in fact feature federal ceilings and preemption clauses that prohibit states from adopting different standards.³² The evidence suggests that a surge in state regu-

³⁰ An example from climate change regulation helps to illustrate: Suppose a state seeking to reduce global-warming-causing pollution establishes renewable portfolio standards in order to spur the development of renewable sources of energy, such as biofuels or geothermal power. The potential benefits of private investment in the development of these (currently not commercially viable) alternative fuels increase substantially if, for example, a federal law creates national demand for them, offers subsidies for their use, or incentivizes investment in technology that makes their adoption and integration into the electricity grid possible. Although Congress could ameliorate global-warming-causing pollution with a variety of policy instruments, the in-state actors in the scenario above will lobby for the policy mix that is most favorable to them: a federal law that creates incentives for developing these alternative fuels, whether by direct regulation or subsidy. Thus, the full potential of the benefits created by state policy is somewhat contingent, in this example, on what the federal government does. (Of course, if a state initiative favors a different constituency, it is that constituency that faces the greatest incentive to push for federal regulation.) Consequently, the ultimate policy mix adopted at the federal level will be affected by the demands from constituencies created in part by state law.

³¹ See Engel & Saleska, *supra* note 9, at 224-28 (providing examples of interest groups “push[ing] for preemptive federal regulation to eliminate a growing prospect of inconsistent regulation by individual states”).

³² Preemptive environmental statutes are a subset of a much larger set of statutes that preempt a wide variety of state regulations. Ninety-one preemption statutes, “substituting uniform federal standards for diverse state regulations, were enacted into law during the Reagan era.” Esty, *supra* note 19, at 618 n.175. The rate of congressional preemption appears to have increased in recent years. Of the 522 preemption statutes enacted by Congress between 1790 and 2004, 355 were passed after 1965 (and 41 were passed between 2000 and 2004 alone). JOSEPH F. ZIMMERMAN, CONGRESSIONAL PRE-EMPTION: REGULATORY FEDERALISM 1, 7 (2005). Courts frequently find preemption in the face of statutory ambiguity, despite the judicial “presumption” against preemption. See Issacharoff & Sharkey, *supra* note 21, at 1372 (arguing that the Rehnquist Court “read the claims of congressional authority broadly and . . . correspondingly narrowed the scope for state conduct”). And Congress rarely, if ever, responds by restoring state

lation frequently precedes industry demand for federal regulation,³³ and that even relatively few states can trigger a defensive industry response.³⁴

The history of the auto industry's reaction to state-level regulation provides perhaps the best evidence for the defensive preemption thesis.³⁵ Congress passed the Motor Vehicle Pollution Control Act of 1965 at least partially in response to industry fears about stringent regulation in California—which had already set state emissions standards—and a handful of other states that were close behind. As previously noted, the automobile industry had become extremely concerned about the possibility of complying with disparate state standards.³⁶ So, while publicly opposing federal air pollution legislation, the industry privately supported federal standards that would preempt the states³⁷ and pushed for more explicit preemption provisions in the 1967 Air Quality Act.³⁸

Ever since, Congress has consistently sought to calm the automobile industry's anxiety about state-level regulation that could require different cars for different markets.³⁹ For example, Congress pre-

authority. Note, *New Evidence on the Presumption Against Preemption*, 120 HARV. L. REV. 1604, 1619 (2007).

³³ See generally BAILEY, *supra* note 6, at 109, 118, 122, 128-29.

³⁴ In 1963, although thirty-two states had air pollution statutes on the books, only fifteen actually had authority to restrict pollution and fewer than six were enforcing their laws. *Id.* at 104.

³⁵ Both this history and an account of the soft coal industry's reaction to early air pollution legislation are summarized in Elliott et al., *supra* note 8, at 330-33.

³⁶ See *supra* text accompanying note 28; see also BAILEY, *supra* note 6, at 118 ("The prospect of each state establishing its own emissions standards was sufficient to force [the automobile industry] to lobby for federal pre-emption of state authority.").

³⁷ BAILEY, *supra* note 6, at 122.

³⁸ *Id.* at 130, 133-34; see 42 U.S.C. §§ 7543(a)-(b), 7545(c)(4) (2000) (barring states from adopting standards "relating to the control of emissions from new motor vehicles" and "fuel or fuel additive[s]," subject to waiver in the case of standards at least as stringent as the applicable federal standards). California is given a specific waiver of federal preemption, *id.* § 7543(e), and other states may adopt California's standards, *id.* § 7507.

³⁹ For example, the House Report on the Air Quality Act of 1967 quotes the statement in the House Committee report that

"[t]he committee is convinced that motor vehicle exhaust control standards on a national scale are necessary and would be of benefit to the entire country. . . . While the committee is cognizant of the basic rights and responsibilities of the States for control of air pollution, it is apparent that the establishment of Federal standards applicable to motor vehicle emissions is preferable to regulation by individual States."

empted states from setting fuel economy standards in the Energy Policy and Conservation Act of 1975, reserving that power to the National Highway Traffic Safety Administration.⁴⁰

Having lost the battle to prevent California from retaining the power to exceed federal standards, the auto industry sought to limit any remaining potential for disparate state regulation. To do this the industry has appealed not to Congress but to the courts: the auto companies have consistently sought to block other states from adopting standards that are not “identical” to California’s, on the ground that disparate standards would force the automakers to produce a “third car” in addition to the two (one federal, one Californian) that the Act already permits.⁴¹

Other industries have reacted similarly in the face of state regulation. In the run-up to the Air Quality Act of 1967, several northeastern states adopted rules restricting coal usage, and the soft coal indus-

H.R. REP. NO. 90-728 (1967), *reprinted in* 1967 U.S.C.C.A.N. 1938, 1955 (quoting H.R. REP. NO. 89-899 (1965)). The House Report also cites the statement in the report of the Senate Committee that

“[i]n view of the fact that the automobile is one of the principal sources of air pollution and manufacturers have the capability of incorporating air pollution reduction facilities in their vehicles, there is no apparent reason why the entire Nation should not benefit from such advances. Also, it would be more desirable to have national standards rather than for each State to have a variation in standards and requirements which could result in chaos insofar as manufacturers, dealers, and users are concerned.

“The committee has found that the automotive industry has the capability for limiting the emissions of hydrocarbons and carbon monoxide from both the crankcase and exhaust systems of gasoline powered motor vehicles and found a willingness to accept legislation which would establish national standards, and it is the hope of the committee that individual States will accept national standards rather than additionally impose restrictions which might cause undue and unnecessary expense to the user.”

Id. at 1956 (quoting S. REP. NO. 89-192, at 6, 8 (1965) (internal citations omitted)).

⁴⁰ Energy Policy & Conservation Act, Pub. L. No. 94-163, § 502, 89 Stat. 871, 902 (1975) (codified as amended in scattered sections of 15 and 42 U.S.C.).

⁴¹ *See Ass’n of Int’l Auto. Mfrs. v. Comm’r*, 208 F.3d 1, 8 (1st Cir. 2000) (striking down Massachusetts regulations purporting to adopt California standards on the ground that obligations in a Memorandum of Understanding signed by California and auto manufacturers did not constitute a “standard” eligible for adoption by other states); *Am. Auto. Mfrs. Ass’n v. Cahill*, 152 F.3d 196, 197 (2d Cir. 1998) (holding impermissible New York’s adoption of California’s zero-emission vehicles standard because it was not identical to California’s standard); *Motor Vehicle Mfrs. Ass’n v. N.Y. State Dep’t of Env’tl. Conservation*, 79 F.3d 1298, 1308 (2d Cir. 1996) (ruling that New York’s adoption of California’s more stringent fuel standard was permissible because “alterations stemming from differences in fuels—as opposed to differences in emissions standards—cannot amount to a third vehicle violation”).

try responded to this development as the auto manufacturers had to state emissions regulation. The industry began demanding federal preemption of state regulatory efforts, along with federal funding for research into pollution control technologies.⁴²

Finally, the history of the acid rain provisions of the Clean Air Act also supports the defensive preemption thesis. Congress's acid rain program was precipitated in part by regulatory activity in the states. In the early 1980s, several states began research efforts to determine whether to regulate sulfur dioxide emissions in order to reduce acid rain.⁴³ The first state to take regulatory action was New York in 1984,⁴⁴ followed in 1985 by New Hampshire,⁴⁵ Massachusetts,⁴⁶ and Wisconsin.⁴⁷ Finally, in 1988, California and Minnesota passed statutes that

⁴² See BAILEY, *supra* note 6, at 128-29.

⁴³ See, e.g., Kapiloff Acid Deposition Act, 1982 Cal. Stat. 5677 (establishing a research and monitoring program on, inter alia, the effects of acid rain in California), *repealed and amended* by 1988 Cal. Stat. 1518 (codified at CAL. HEALTH & SAFETY CODE §§ 39900-39911 (West 2006)); ME. REV. STAT. ANN. tit. 38, § 603-B (2001) (authorizing a study of acid rain in Maine to be completed between 1985 and 1987); MD. CODE ANN., NAT. RES. § 3-3A-01 to -04 (LexisNexis 2000) (requiring study of how conservation efforts in Maryland might reduce acid rain).

⁴⁴ JAMES L. REGENS & ROBERT W. RYCROFT, THE ACID RAIN CONTROVERSY 142 (1988). The State Acid Deposition Control Act, N.Y. ENVTL. CONSERV. LAW §§ 19-0901 to -0923 (McKinney 2006), required New York's Department of Environmental Conservation to develop a plan to achieve a 12% reduction from the state's 1980 levels of sulfur dioxide emissions by 1988 and a 30% reduction by 1991, but did not specify how to achieve this goal. REGENS & RYCROFT, *supra*, at 142.

⁴⁵ New Hampshire's statute required a 50% reduction in sulfur dioxide emissions to be achieved in two phases, including a 25% reduction by 1991. N.H. REV. STAT. ANN. § 125-D:3 (LexisNexis 2006). Like New York's statute, the New Hampshire statute left the decision of how to achieve this reduction to the state's Department of Environmental Services. *Id.*

⁴⁶ An Act Limiting Acid Rain and Acid Deposition, 1985 Mass. Acts 897. Like the New Hampshire statute, the Massachusetts statute set an emissions cap, "prohibiting any four-year average . . . from exceeding the average of total statewide actual annual sulfur dioxide emissions in the years [1979] to [1982]." *Id.* at 897 § 4. Furthermore, Massachusetts required all fossil-fuel-generating facilities to create fewer than 1.2 pounds of sulfur dioxide per million BTUs by 1994. 310 MASS. CODE REGS. 7.22 (2004). The Massachusetts statute gave emitters of sulfur dioxide a variety of options for meeting the BTU limitation, including trading emissions with other generators of sulfur dioxide. *Id.*

⁴⁷ Wisconsin's statute was more specific: it focused on the state's five major utilities, which produced over 70% of the state's sulfur dioxide. REGENS & RYCROFT, *supra* note 44, at 142. The statute required utilities to reduce their emissions to no more than 1.2 pounds of sulfur dioxide per million BTUs by the mid-1990s. 1985 Wis. Sess. Laws 1288, 1291, sec. 24, § 144.386(2)(a) (codified at WIS. STAT. ANN. § 285.41(2)(a) (West 2004)). It also set a total cap on sulfur dioxide emissions from Wisconsin's "major utilities" at 500,000 tons annually beginning with 1985. *Id.* at 1289, sec. 13, §

combined the establishment of studies of acid rain's effects with taxes on sulfur dioxide emitters.⁴⁸

Some observers have claimed that the state experiments with acid rain regulation served as models for the federal emissions trading scheme that later emerged. After all, at least one state—Wisconsin—had adopted a trading regime.⁴⁹ This may be true, but the availability of a state-level model did not drive the federal response. It seems more likely that some state regulations amounted to indirect product regulation of coal inputs in a fiercely competitive national coal market by effectively favoring one kind of coal (e.g., lower sulfur western coal) over another (higher sulfur midwestern coal). This, coupled with the uncertainties created by the variety of state programs (some programs left it unclear how targets would be met), helped to prompt industry demand for federal standards.⁵⁰

In sum, our more refined DPT predicts that (1) where heterogeneous state regulation threatens to require costly product differentiation for industries that produce national (or at least regional) products, or (2) when the price of regulatory uncertainty for capital-

144.385(3)(a) (repealed 1995). Although the legislature designated caps for individual utilities, those caps would apply only if the total emissions cap for all utilities was exceeded. *Id.* at 1289, sec. 14, § 144.385(3)(b) (repealed 1995). The statute also allowed Wisconsin utilities to trade emissions after 1992, subject to Department of Natural Resources oversight. *Id.* at 1291, sec. 24, § 144.386(2)(b) (codified at § 285.41(2)(b)).

⁴⁸ California assessed companies that emitted more than 500 tons of sulfur dioxide annually a 0.25 cent per pound fee in order to fund the state's research and monitoring of acid rain. *See* 1988 Cal. Stat. 5393, ch. 1518, §§ 39906–39908 (providing for imposition of fees on “nonvehicular sources of sulfur and nitrogen oxides which emit 500 tons or more per year”); James L. Regens, *Acid Rain Policymaking and Environmental Federalism: Recent Developments, Future Prospects*, PUBLIUS, Summer 1989, at 75, 78-79 (detailing the fees). Minnesota required its major utilities “to fund sixty percent of the costs of both monitoring compliance with acid deposition control standards and researching on the impact of acid deposition.” Elyn R. Weiss & James Salzman, *The Greening of American Energy Policy*, 63 ST. JOHN'S L. REV. 691, 712 (1989) (citing MINN. STAT. § 116C.69(3) (1988)).

⁴⁹ Some Wisconsin politicians have claimed that their state trading law served as a model for Title IV of the Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399, 2584-2634, which addressed acid deposition control. *See* Norman C. Anderson & Spencer Black, *The Past and Future of Environmental Protection Law in Wisconsin*, 2 WIS. ENVTL. L.J. 239, 255 (1995) (“Because of Wisconsin, which passed the strongest law in the nation in 1985, and the federal law that was modeled on what we did in Wisconsin, the problem of acid rain is on its way to a solution.”).

⁵⁰ In the end, the primary dividing lines over the actual content of the federal bill were regional. *See* Brian L. Ferrall, *The Clean Air Act Amendments of 1990 and the Use of Market Forces To Control Sulfur Dioxide Emissions*, 28 HARV. J. ON LEGIS. 235, 246-48 (1991) (explaining the impact of various regional interests on the drafting of the legislation).

intensive industries is so high that federal clarification becomes a priority, industry is more likely to seek, and Congress is more likely to deliver, federal statutes that contain uniform federal ceilings. In such cases, industry will have successfully “picked off” the leader states and—depending on the extent of preemption—brought an abrupt halt to the state innovation that prompted the industry demand for federal regulation in the first place.⁵¹

We are now in a position to see precisely why, as Engel and Saleska put it, “regulation at a lower jurisdictional level can trigger regulation at a higher level”—that is, why, in their words, there is a “domino effect.”⁵² The combined insights from the environmental federalism and defensive preemption literatures predict when environmentalists, or state and local governments, will seek federal floors, and when industry will seek federal ceilings.⁵³ These perspectives do not conflict; they just explain the demand for federal regulation from two different vantage points.

As we shall see, in the case of climate change the traditional RBT and ISE theses have limited explanatory power, while DPT is borne out. Still, the climate change example reinforces the claim that state initiatives can increase the likelihood and move up the timing of federal regulation. This is not to say that state regulation is solely *responsible* for prompting federal legislation, only that states can play an important role as incremental catalysts of a federal policy response.

II. CLIMATE CHANGE

A. *The “Puzzle” of State Initiatives*

To illustrate this phenomenon, we turn to our case study on climate change. For the last few years, state and local governments, ei-

⁵¹ Thus, in an illustration of how dynamic federalism can be, state innovation can ultimately create the very conditions that prompt federal preemption, which in turn limits the regulatory latitude that states enjoy. See *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) (noting that although states should be free to experiment with policy, an “unreasonable” state measure could provoke federal intervention).

⁵² Engel & Saleska, *supra* note 9, at 223.

⁵³ “[U]niform minimum standards may raise the overall standard of environmental protection and foreclose the possibility of a race to the bottom while uniform maximum standards may allow the private sector to operate within a predictable and stable environment.” Paul S. Weiland, *Federal and State Preemption of Environmental Law: A Critical Analysis*, 24 HARV. ENVTL. L. REV. 237, 276 (2000).

ther alone or in regional groups, have adopted a wide variety of initiatives to address climate change, some of them regulatory in nature, others based more on incentives or direct investment in technology. These initiatives have arisen against the background of a relative vacuum of policy response at the federal level.⁵⁴ At first glance, unilateral

⁵⁴ We say “relative” because the federal government arguably *has* adopted a policy response to climate; that response, however, relies on voluntarism and eschews regulation. The Bush administration has publicly committed itself to a domestic strategy of asking for voluntary GHG reductions (supported by tax incentives), and, after withdrawing from the Kyoto Protocol, the administration has combined this position with support for technology development. U.S. Dep’t of State, Climate Change Fact Sheet: The Bush Administration’s Action on Global Climate Change (May 18, 2005), <http://www.state.gov/g/oes/rls/fs/46741.htm>. Most notably, in both the domestic and international settings, the administration has rejected imposing mandatory limits on GHGs, whether through a cap-and-trade or any other regulatory program. See *The Role of Science in the Asia-Pacific Partnership: Hearing Before the Subcomm. on Global Climate Change of the S. Comm. on Commerce, Sci. & Transp.*, 109th Cong. 6 (2006) (statement of James L. Connaughton, Chairman, White House Council on Environmental Quality) (testifying that “a successful international response to climate change” requires “a spirit of collaboration, not coercion”). A variety of domestic bills and proposals to establish some version of a cap-and-trade program made little progress in the Republican-led 109th Congress. See, e.g., Climate Stewardship Act of 2005, S. 342, 109th Cong. (2005) (proposing a market-driven tradable allowances system); RESOURCES FOR THE FUTURE, RFF SCHOLARS RESPOND TO “DESIGN ELEMENTS OF A MARKET-BASED GREENHOUSE GAS REGULATORY SYSTEM” BY SEN. PETE V. DOMENICI AND SEN. JEFF BINGAMAN—FEBRUARY 2006, at 7-8 (2006), available at http://www.weathervane.rff.org/solutions_and_actions/United_States/Federal_Approach/RFF_Scholars_Respond_to_Domenici_Bingaman_White_Paper.pdf (discussing the Domenici-Bingaman proposal, which was largely based on NAT’L COMM’N ON ENERGY POLICY, ENDING THE ENERGY STALEMATE, at iv-v (2004), available at http://www.energycommission.org/files/contentFiles/report_noninteractive_44566feaabc5d.pdf).

At the same time, the Bush EPA declined to regulate GHGs from new automobiles under section 202(a) of the Clean Air Act, 42 U.S.C. § 7521(a) (2000), arguing that GHGs are not “pollutants” under the Act, and that, even if they were, the agency should not regulate them for a variety of policy reasons. Control of Emissions from New Highway Vehicles and Engines, 68 Fed. Reg. 52922 (Sept. 8, 2003). The Supreme Court subsequently held that carbon dioxide and other GHGs are pollutants within the meaning of the Act and that the EPA thus has authority to regulate them. See *Massachusetts v. EPA*, 127 S. Ct. 1438, 1460-62 (2007) (remanding the EPA denial of a rulemaking petition for reconsideration based only on scientific evidence of adverse health or welfare effects). Pending the outcome of this case, the EPA had delayed consideration of California’s waiver application under the special exemption provision of section 209 of the Clean Air Act, 42 U.S.C. § 7543(b) (2000), which would authorize regulation of GHG emissions from tailpipes by the California Air Resources Board (ARB) pursuant to state legislation. See Letter from William L. Wehrum, Acting Ass’t Adm’r, EPA, to Catherine Witherspoon, Executive Officer, Cal. Air Res. Bd. (Feb. 21, 2007), available at <http://www.regulations.gov/fdmspublic/ContentViewer?objectId=09000064801ff600&disposition=attachment&contentType=pdf>. EPA Administrator Johnson subsequently announced that he would allow the waiver process to start, and that EPA would publish a notice scheduling the required hearing. See David Shepard-

state action to address climate change is surprising. Global warming is a classic public bad; it poses a global collective action problem. Neither a single state, nor a small handful of states, should be willing to invest in emissions regulation—both because a few jurisdictions acting alone cannot hope to make meaningful progress on the problem, and because the nature of global warming means that proactive states cannot fully internalize the benefits of their regulatory efforts, and must instead share those benefits.⁵⁵ Thus, although state regulation in response to climate change may create negative externalities under some circumstances (e.g., if it burdens out-of-state interests), it necessarily creates positive externalities. States that generate these benefits for others (and for the world, really) may bear significant in-state costs.⁵⁶ Generally, such conditions—significant costs and an inability

son, *EPA Official: Supreme Court Decision a 'Stunner'*, DETROIT NEWS (online edition), Apr. 16, 2007, <http://www.detroitnews.com/apps/pbcs.dll/article?AID=/20070416/UPDATE/704160413/1148/AUTO01>. Behind the waiver application lurks an automobile industry challenge to the emission standards; the industry argues that California's standards are preempted by the Energy Policy and Conservation Act (EPCA), the federal statute reserving fuel efficiency standards to the federal government. *See* Cent. Valley Chrysler-Jeep v. Witherspoon, 456 F. Supp. 2d 1160, 1167, 1174 (E.D. Cal. 2006) (holding that automobile manufacturers state a claim challenging California's regulations under the EPCA) (citing 49 U.S.C. § 32919(a) (2000) (providing that "a State . . . may not adopt or enforce a law or regulation related to fuel economy standards . . . for automobiles covered by an average fuel economy standard under" the EPCA)).

⁵⁵ However, it is true that some states have more to lose than others should GHG emissions continue unabated. For example, coastal states will suffer more losses from rising sea levels than land-bound states. And states like California, which depend on a water supply from mountain snowmelt, may face greater costs because rising temperatures could lead to flooding and drought. *Cf.* Engel & Saleska, *supra* note 9, at 209 (arguing that it is rational for states to regulate GHG pollution).

⁵⁶ For example, California's Global Warming Solutions Act of 2006, 2006 Cal. Stat. 89 (codified at CAL. HEALTH & SAFETY CODE §§ 38500–38599 (West Supp. 2007)), mandates GHG emissions reductions to minimize adverse impacts of global warming on California. A report by the California Climate Action Team suggests that the regulatory measures adopted in a proposal similar to the Global Warming Solutions Act will produce net economic gains for the state, including 83,000 jobs and approximately \$4 billion in gross income. CAL. CLIMATE ACTION TEAM, CAL. ENVTL. PROT. AGENCY, CLIMATE ACTION TEAM REPORT TO GOVERNOR SCHWARZENEGGER AND THE LEGISLATURE 65 (2006), *available at* http://www.climatechange.ca.gov/climate_action_team/reports/2006-04-03_FINAL_CAT_REPORT.PDF. Yet the real cost of regulations promulgated pursuant to the new law is unknown because the regulations themselves have not been designed. The Act does not impose a hard cost constraint, mandating only that the ARB set an emissions limit equivalent to 1990 gross levels by 2010 and requiring that the regulations achieve "the maximum technologically feasible and cost-effective" reductions. §§ 38550, 38560. The Act defines "cost-effective" as the cost of reduced GHG emissions "adjusted for its global warming potential." § 38505(d). Depending on the extent and stringency of the regulations, and their impact on electricity prices, among other things, the costs to the state of California could be substantial.

to fully capture benefits—are the conditions under which we would expect to see either state inaction or a race to the bottom. Yet instead, we see state leadership.

On closer examination, however, the emergence of state initiatives is not so puzzling.⁵⁷ There are a variety of alternative explanations for why states are acting,⁵⁸ the most plausible of which is that governors and state legislators are simply responding to the preferences of their electorates.⁵⁹ This explains why some states are pushing forward even though they face strong industry opposition and the benefits of their efforts may be minimal—or, if not minimal, not able to be internalized.⁶⁰ Bolstering this account are national and state-level polling data indicating strong public support for state action to address climate change. For example, data from California, New York, and the cluster

⁵⁷ See, e.g., Barry G. Rabe, Mikael Romàn & Arthur N. Dobelis, *State Competition as a Source Driving Climate Change Mitigation*, 14 N.Y.U. ENVTL. L.J. 1, 3-4 (2005) (claiming that much subnational regulation amounts to state positioning in anticipation of federal or international regulation, and arguing that state regulation can be explained in terms of an interjurisdictional competition among states for economic development).

⁵⁸ For a summary of alternative explanations, see Glicksman, *supra* note 2, at 779-80. These include claims that “cooperative federalism programs” have allowed the states to close the “institutional competence” gap with federal regulators; that “inflexibility on the part of federal regulators provided further opportunities for states”; that local politicians are motivated by “ideological commitments” and responsiveness to “constituents’ demands for greater environmental protection”; that local needs driving state initiatives are of little concern to federal officials; and that state and local entities might adopt environmental standards to forestall “the imposition of more rigorous federal controls.” *Id.*; see also William W. Buzbee, *Contextual Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 108, 115-16 (2005) (arguing that decreased federal environmental action provides an opportunity for states “to supplement federal enforcement,” and to respond to the preferences of the median voter at the “relevant level of government”); David L. Markell & Martha F. Davis, Introduction, *A Conversation on Federalism and the States: The Balancing Act of Devolution*, 64 ALB. L. REV. 1087, 1087-88 (2001) (arguing that devolution of regulation to state governments has increased through encouragement by the federal executive). The emerging literature on state initiatives seems to claim that the pendulum has swung back to the states as leaders in environmental protection as the federal role has, for a variety of reasons, diminished. See *id.*; see also Glicksman, *supra* note 2, at 778 (“The recent reduction in federal authority to take actions to protect the environment that has resulted from the decisions of the federal courts, Congress, and the Executive Branch has created a partial vacuum.”).

⁵⁹ See Wiener, *supra* note 14, at 754 n.23 (1999) (citing the “race to the top” among politicians vying for national office and “rising voter demand for environmental protection” as the explanations for the early surge in environmental regulation).

⁶⁰ Although it is true that some of the state initiatives impose costs on out-of-state interests such as the auto industry (meaning that there will be less opposition from the state’s electorate), some measures clearly burden in-state firms and drive up costs for consumers.

of states that signed the Regional Greenhouse Gas Initiative (RGGI)⁶¹—the “leader” states on climate regulation—show strong public support for state regulatory efforts.⁶² Yet, for us the most inter-

⁶¹ The RGGI established a regional cap-and-trade program for GHGs in northeast and mid-Atlantic states. See CO₂ BUDGET TRADING PROGRAM MODEL RULE (Reg'l Greenhouse Gas Initiative, Final Draft with Corrections 2007), available at http://www.rggi.org/docs/model_rule_corrected_1_5_07.pdf (guiding the stabilization and reduction of GHGs among signatory states); Press Release, Reg'l Greenhouse Gas Initiative, States Reach Agreement on Proposed Rules for the Nation's First Cap-and-Trade Program to Address Climate Change (Aug. 15, 2006), available at http://www.rggi.org/docs/model_rule_release_8_15_06.pdf (naming Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont as participating states).

⁶² National polls show that the vast majority of voters support state and local efforts to address climate change. See, e.g., Opinion Research Corp., *Global Warming & Alternative Energy: A Leadership Survey*, at slide 6 (Mar. 15, 2006), available at <http://resultsforamerica.org/calendar/files/R%20CSI%20Global%20Warming%20Leadership%20Survey%20final.pdf> (“More than four out [of] five Americans (83 percent) agree that ‘in the absence of federal leadership,’ they support ‘efforts by state and local officials to curb global warming and promote new energy resources.’”).

Some current state efforts get broad public support. Much of this data reports on California voters' preferences. See PUB. POLICY INST. OF CAL., *PPIC STATEWIDE SURVEY: SPECIAL SURVEY ON THE ENVIRONMENT*, at v (2005), available at http://www.ppic.org/content/pubs/survey/S_705MBS.pdf (finding that “[a] majority (54%) express a preference for their state government to develop its own policies, apart from the federal government, to address the issue of global warming”). “77 percent favor the state law requiring automakers to further reduce the emissions of greenhouse gases from new cars in California, beginning in 2009. Support for this measure has remained steady since June 2002.” *Id.* “69 percent support the . . . [GHG] emission targets recently established by Governor Arnold Schwarzenegger, which aim to reduce GHG emissions from cars, power plants, and industry by more than 80 percent over the next 50 years.” *Id.* Furthermore, an increasing number of state citizens are beginning to consider climate change an issue important to them. For example,

“Californians now rank global warming as more important than at any time since we first started asking about it in June of 2000,” says PPIC survey director Mark Baldassare. “They are so concerned that two-thirds actually want the state to address this issue—completely independent of the federal government.” Support for such unilateral action is up by 11 points (65% vs. 54%) since last year at this time and cuts across party lines: Democrats (73%), independents (70%), and Republicans (62%) all strongly support state action.

PUBLIC POLICY INST. OF CAL., *PPIC STATEWIDE SURVEY: SPECIAL SURVEY ON THE ENVIRONMENT*, at v (2006), available at http://www.ppic.org/content/pubs/survey/S_706MBS.pdf.

Data show public support for GHG regulation in other states as well. See, e.g., Press Release, Market Decisions, *Poll Shows Mainers Pessimistic About the Environment and Deeply Concerned About Global Warming* (Sept. 5, 2006), available at <http://marketdecisions.com/docs/55.GlobalWarmingPressRelease.doc> (concluding that Maine residents overwhelmingly believe global warming is occurring and that the state is doing a better job than the federal government in dealing with it); Press Release, Md. League of Conservation Voters Educ. Fund, *Nine Out of Ten Maryland Voters Support the Healthy Air Act* (Mar. 2, 2006), available at

esting thing about the state climate initiatives is not that they occur at all, but rather what they teach us about the prospects for, and shape of, federal legislation.

B. *Overview of State Initiatives*

In this section, we present an overview of state climate initiatives, based on data provided by the Pew Center for Global Climate Change.⁶³ First, we suggest that the level and nature of activity in the states to date are likely to worry industry, consistent with the predictions of DPT. The emerging patchwork of state measures seems perfectly designed to make industry nervous. A few states have announced their intention to impose costly emissions reduction requirements on the electricity sector, but have not yet identified their implementation strategies,⁶⁴ while other states have identified multiple policy approaches but have not yet fully described the range of compliance options for firms. Several states have signaled their intention to target the transportation sector as well. California has led the

http://www.cleanenergypartnership.org/news/article_detail.cfm?id=158 (noting that, according to a 2006 poll, “90% of likely Maryland voters support the Healthy Air Act, a bill that would require Maryland’s dirtiest power plants to significantly reduce harmful emissions of nitrogen, sulfur, mercury, and carbon dioxide”); Opinion Research Corp., Massachusetts Renewables/Cape Wind Survey 15, 7 (June 7, 2006), *available at* http://www.resultsforamerica.org/calendar/files/R_CSI%20Massachusetts%20Cape%20Wind%20Survey%20602.pdf (“The vast majority of Massachusetts adults (94%) think it is important that the state and others take steps [such as the development of clean alternative energy resources] to reduce global warming and our addiction to foreign energy sources.”). And state leadership has responded to this sentiment: Maine is “participating in the RGGI effort”; “[l]egislation was signed in April, 2006, that requires Maryland to become a full participant in the process by June 30, 2007”; and Massachusetts is an “observer[] in the process.” Reg’l Greenhouse Gas Initiative, Participating States, <http://www.rggi.org/states.htm> (last visited May 1, 2007).

The nonregulatory policies adopted by other states can be explained as a response to voter preferences for economic development if not environmental protection. For example, wind-rich plains states stand to benefit from the growth of wind energy, just as farm states stand to benefit from investment in ethanol (E85) and other biofuels as a result of regulation of carbon emissions. *See, e.g.*, Editorial, *State Support of Wind Farms Should Increase*, DAILY IOWAN, Apr. 17, 2007, *available at* <http://media.www.dailyiowan.com/media/storage/paper599/news/2007/04/17/Opinions/State.Support.Of.Wind.Farms.Should.Increase-2845018.shtml> (acknowledging the economic importance of wind power and ethanol to Iowa).

⁶³ *See generally* Pew Ctr. on Global Climate Change, *What’s Being Done in the States*, http://www.pewclimate.org/what_s_being_done/in_the_states/ (last visited May 1, 2007).

⁶⁴ *See e.g.*, California Global Warming Solutions Act of 2006, 2006 Cal. Stat. 89 (codified at CAL. HEALTH & SAFETY CODE §§ 38500–38599 (West Supp. 2007)).

way by regulating tailpipe emissions, and other states have moved to adopt the California standards even before the EPA has granted California a waiver. It is becoming clear to industry that many states will require it to do something—perhaps a variety of things—that may prove costly. Still unclear, however, is exactly what industry will have to do and by what deadline. It is also unclear how requirements will differ among the states.

Second, we show that, to the dismay of environmentalists, the state measures are not likely to produce large reductions nationally. Few states have set clear emissions reductions targets, and fewer still have designed policies to achieve them. Even the most ambitious state targets are strikingly low, the deadlines generous, and the percentage of emitters covered quite limited. California's "cap" on emissions is, at the moment, more like a target, with implementation strategies all but unknown.⁶⁵ Finally, with the exception of California (which is being sued by auto manufacturers on preemption grounds)⁶⁶ and a handful of northeastern states,⁶⁷ the overwhelming majority of states have not taken action to regulate the transportation sector—a notable omission since this sector produces nearly one-third of GHG emissions nationwide.

Below is a brief summary of current state initiatives. Although these measures are in flux at the time of writing and likely to broaden over time, this overview provides a useful snapshot of the state regulations enacted at the time Congress began to focus seriously on passing federal legislation. We highlight areas of uncertainty to underscore how these measures, while concerning enough to motivate industry appeals for federal legislation, nevertheless leave many questions of design and implementation unanswered, which helps to drive environmentalists to Congress as well.

⁶⁵ See, e.g., CAL. HEALTH & SAFETY CODE §§ 38550, 38560, 38560.5 (West Supp. 2007) (delegating rulemaking authority to implement the Global Warming Solutions Act to the ARB, rather than setting a specific cap).

⁶⁶ Cent. Valley Chrysler-Jeep v. Witherspoon, 456 F. Supp. 2d 1160, 1166 (E.D. Cal. 2006).

⁶⁷ To date, eleven other states have adopted California's GHG emissions standards under section 177 of the Clean Air Act, 42 U.S.C. § 7507 (2000). These include Arizona, Connecticut, Maine, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington. See Pew Ctr. on Global Climate Change, State Legislation from Around the Country, http://www.pewclimate.org/what_s_being_done/in_the_states/state_legislation.cfm#vehicles (last visited May 1, 2007).

1. State Renewable Portfolio Standards

Legislatures in twenty-two states now require their electric utilities to generate some energy from renewable sources.⁶⁸ The features of these Renewable Portfolio Standards (RPSs) vary greatly in terms of the amount of renewable energy required, the types of generation accepted, and the timelines for compliance. Some programs set modest objectives; for example, Iowa requires 105 megawatts (MW) to be produced from renewable energy.⁶⁹ Other programs are more ambitious, such as Texas's requirement of 5880 MW by 2015.⁷⁰

From a compliance perspective, the design of some of these programs requires particularly costly forms of renewable energy.⁷¹ One important source of uncertainty concerns the prospects for markets in renewable energy credits. Although such markets promise to spur growth in renewable energy sources and to reduce compliance costs for utilities, this market is currently underdeveloped and trading is largely unregulated.

2. Emissions Caps for New Power Plants

Both Oregon and Washington have established emissions caps for new power plants. Oregon's program will be implemented by the Energy Facility Siting Council (EFSC),⁷² which is authorized to require new power plants to meet a stringent carbon dioxide (CO₂) emissions cap or offset excess emissions.⁷³ The compliance options provide for significant flexibility. Power plants may meet all or part of the reduction requirement through certified cogeneration projects. They may implement approved offset projects themselves or contract with third parties to implement them. Alternatively, they may pay a fee per ton for offsetting the emissions in a manner approved by the EFSC. The

⁶⁸ See, e.g., RABE, *supra* note 2, at 3-4. This number does not include the District of Columbia. *Id.*

⁶⁹ See *id.* at 4 tbl.1 (describing variations in state objectives and timelines for compliance).

⁷⁰ *Id.*

⁷¹ For example, many states require some percentage of electricity to be provided by solar power. See *id.* at 5 tbl.2.

⁷² OR. REV. STAT. § 469.501 (2005).

⁷³ OR. ADMIN. R. 345-024-0550 (2003). The Council's current standard is 0.675 lb CO₂/kWh for base-load natural gas plants and for non-base-load plants that use other fuels. New plants may select from any combination of three compliance strategies.

EFSC has considerable discretion to determine what counts as compliance for these latter two strategies.⁷⁴

Washington passed legislation that requires new large fossil-fueled plants to mitigate 20% of their projected CO₂ emissions.⁷⁵ In addition, plants applying for expansions or modifications that increase their CO₂ emissions by more than 14% must undertake CO₂ mitigation plans. As in the case of Oregon, Washington has three compliance options. Plants may purchase permanent carbon credits traded on a recognized trading authority or exchange, pay a third party to provide mitigation, or directly implement carbon mitigation projects.⁷⁶ Again, as in Oregon, a state agency has oversight authority to monitor and approve the chosen mitigation strategies.⁷⁷ In both states, until oversight agencies develop a clear set of compliance standards, significant uncertainty remains for both regulated industry and concerned environmentalists.

3. Caps and Offsets for Existing Power Plants

Both New Hampshire and Massachusetts⁷⁸ have set emissions caps for existing power plants that may be met through offsets now and through carbon trading in the future. New Hampshire's Clean Power Act mandates annual caps on emissions of CO₂, sulfur dioxide (SO₂), and nitrogen oxides (NO_x).⁷⁹ This only applies to the state's three fossil-fuel-burning power plants owned by Public Service of New Hampshire. The annual cap of 5,425,866 tons will apply until 2010. A cap for years following 2010 has not been determined but will be based on the recommendation of the State's Department of Environmental Services (DES). The legislation allows the affected sources to either reduce emissions directly or buy emissions credits through a national, regional, or other trading program acceptable to DES.⁸⁰ Possible off-site reduction measures include carbon sequestration, shutdown of

⁷⁴ *Id.*; OR. ADMIN. R. 345-024-0560 (2003).

⁷⁵ WASH. REV. CODE ANN. § 80.70.020(4) (West 2001 & Supp. 2007).

⁷⁶ *Id.* § 80.70.020(3).

⁷⁷ *Id.* § 80.70.070.

⁷⁸ Massachusetts became the first state to set a CO₂ emissions standard for existing power plants when the Massachusetts Department of Environmental Protection adopted a multi-pollutant rule. The rule set new emissions standards for carbon dioxide, sulfur dioxide, nitrogen oxides, and mercury. 310 MASS. CODE REGS. 7.29(1) (2004).

⁷⁹ N.H. REV. STAT. ANN. § 125-O:3 (LexisNexis Supp. 2006).

⁸⁰ *See id.* § 125-O:3 to -O:4.

CO₂ sources, renewable energy generation, and other projects approved by DES.

4. State and Regional Cap-and-Trade Programs

The RGGI establishes a regional limit on CO₂ emissions from fossil-fuel-fired electricity generation.⁸¹ Signatory states currently include Delaware, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine, and Maryland.⁸² The RGGI program sets caps for the signatory states, provides for the admittance of new states into the program, and signals the states' intent to integrate the RGGI into a "comparable" federal program should one arise.⁸³

In 2007, the RGGI states issued a final model rule. Each signatory state, however, will follow its own path to adopt the model rule, creating some uncertainty about the timing and form of rule adoption. Some states will seek legislative approval of their component of RGGI; others will bypass their legislatures and establish the program through rulemaking.⁸⁴ The annual cap for the first compliance period, covering years 2009 through 2011,⁸⁵ is 121,253,550 short tons,⁸⁶ which is approximately equivalent to 1990 emissions levels.⁸⁷ There will be no change in the cap for the second period, from 2012 to 2014.⁸⁸ Cap levels are then scheduled to decline by 2.5% per year starting in 2015.⁸⁹ Overall then, the RGGI cap levels are very modest, with a long phase-in period.

⁸¹ CO₂ BUDGET TRADING PROGRAM MODEL RULE §§ XX-1.4(a), XX-1.2(bk) (Reg'l Greenhouse Gas Initiative, Final Draft with Corrections 2007), *available at* http://www.rggi.org/docs/model_rule_corrected_1_5_07.pdf.

⁸² *See supra* note 61 and accompanying text.

⁸³ Reg'l Greenhouse Gas Initiative, Memorandum of Understanding §§ 2C, 5A, 6C (Dec. 20, 2005), *available at* http://www.rggi.org/docs/mou_final_12_20_05.pdf.

⁸⁴ *Id.* § 2A. For example, the governors signing the RGGI largely bypassed the state legislatures, but some of the features of the program may require legislative approval, such as the proposal to auction off a portion of the carbon permits to raise revenue for energy efficiency, renewables, and subsidies for low-income families. *See* Marzilli, *supra* note 23, at A14.

⁸⁵ Reg'l Greenhouse Gas Initiative, *supra* note 83, §§ 3C, 3E(1).

⁸⁶ *Id.* § 2B.

⁸⁷ Reg'l Greenhouse Gas Initiative, Regional Greenhouse Gas Initiative—Overview (Dec. 16, 2005), http://www.rggi.org/docs/mou_rggi_overview_12_20_05.pdf.

⁸⁸ Reg'l Greenhouse Gas Initiative, *supra* note 83, § 2C.

⁸⁹ *Id.* § 2D.

A Western Regional Climate Action Initiative is in the very early stages of development. The initiative, which was signed by the governors of Washington, Oregon, California, New Mexico, and Arizona, calls for the states to agree on an overall regional goal for GHG emissions reductions within six months, design a market-based cap-and-trade program for the region within 18 months, and participate in a multistate GHG registry.⁹⁰

The only state to act independently to establish a cap on global warming emissions is California, which in 2006 enacted the Global Warming Solutions Act.⁹¹ That statute articulates a goal of reducing state GHG emissions to their 1990 levels by 2020, representing a cut of 25%.⁹² No policy approach is explicitly required by the statute, nor has the Governor, the Assembly, or any of the relevant regulatory bodies yet released a plan for implementation. Nevertheless, the statute contemplates a combination of direct reductions, a tradable permit system, and other mechanisms.⁹³ The law is expected to apply to multiple sectors (e.g., transportation and electricity generation) and envisions the use of hard caps as a constraint on aggregate emissions.

5. Fuel and Tailpipe Emissions for Automobiles

In 2002, California passed Assembly Bill (AB) 1493, requiring the first tailpipe standard for GHG emissions in the country.⁹⁴ The law directs the California Air Resources Board (ARB) to develop and implement automobile emissions standards under strict conditions.⁹⁵ The legislation requires that the ARB standards achieve “the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles,” while accounting for social, environmental, technological, and economic factors.⁹⁶ In 2004, the ARB

⁹⁰ See Western Regional Climate Action Initiative, Final Agreement (Feb. 26, 2007), http://www.governor.wa.gov/news/2007-02-26_WesternClimateAgreementFinal.pdf; see also Juliet Eilperin, *Western States Agree To Cut Greenhouse Gases*, WASH. POST, Feb. 27, 2007, at A8.

⁹¹ California Global Warming Solutions Act of 2006 (codified at CAL. HEALTH & SAFETY CODE §§ 38500–38599 (West Supp. 2007)).

⁹² See CAL. HEALTH & SAFETY CODE § 38550 (West Supp. 2007).

⁹³ See *id.* § 38562(a) (authorizing direct reductions); § 38570 (authorizing the creation of a market-based cap-and-trade system).

⁹⁴ A.B. 1493, 2001–2002 Assemb. (Cal. 2002) (codified at CAL. HEALTH & SAFETY CODE §§ 42823, 43018.5 (West 2006)).

⁹⁵ *Id.* at sec. 3, § 43018.5.

⁹⁶ *Id.*

promulgated thirteen regulations, the most important of which requires a 1%-2% reduction in emissions by 2009, depending on vehicle type, rising incrementally to reach approximately 30% below projected 2009 levels by 2016.⁹⁷ To date, eleven other states have adopted the California standards,⁹⁸ although these standards are pending EPA approval⁹⁹ and the resolution of litigation brought by the auto industry.¹⁰⁰

In addition, in January 2007, the governor of California expressed his intention to implement a Low Carbon Fuel Standard. Such a standard would apply to all transportation fuels and seeks to reduce the carbon intensity of California's passenger vehicle fuels at least 10% by 2020. Compliance could be achieved through carbon credit trading. Through this policy, low-carbon fuels are expected to replace at least 10% of current vehicle gasoline consumption.¹⁰¹

6. State/Regional Registry Programs

In the Energy Policy Act of 1992, Congress required the Energy Information Administration (EIA) of the Department of Energy to create reporting forms and a database for voluntary reporting of both GHG emissions and emissions reductions.¹⁰² EIA has explicitly stated that the program was not designed to support credit for early reductions.¹⁰³ Nevertheless, firms may be reporting their reductions under the federal program in the hope that they will receive credit in the future.¹⁰⁴

⁹⁷ CAL. CODE REGS. tit. 13, § 1961.1 (2007).

⁹⁸ See Pew Ctr. on Global Climate Change, *supra* note 67.

⁹⁹ See Letter from William L. Wehrum to Catherine Witherspoon, *supra* note 54.

¹⁰⁰ See *Green Mountain Chrysler Plymouth Dodge Jeep v. Dalmasse*, No. 05-CV-302, 2006 WL 3469622, at *2, *7 (D. Vt. Nov. 30, 2006) (denying the state's motion to dismiss an auto industry challenge to Vermont's adoption of the California tailpipe regulations pursuant to section 177 of the federal Clean Air Act).

¹⁰¹ Cal. Exec. Order No. S-01-07 (Jan. 18, 2007), available at <http://gov.ca.gov/index.php?/executive-order/5172>.

¹⁰² See Energy Policy Act of 1992, 42 U.S.C. § 13385 (2000) (calling for a rulemaking regarding the voluntary reporting program); see also ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, VOLUNTARY REPORTING OF GREENHOUSE GASES 73-75 (2004), available at [http://www.eia.doe.gov/oiaf/1605/vr04data/pdf/0608\(04\).pdf](http://www.eia.doe.gov/oiaf/1605/vr04data/pdf/0608(04).pdf) (summarizing the voluntary reporting program).

¹⁰³ See *infra* note 115.

¹⁰⁴ See, e.g., Engel & Saleska, *supra* note 9, at 216-17. The EIA prepared reports summarizing the progress of the database for each year from 1994 to 2004 but stopped preparing the reports in 2005 because of "[b]udget considerations and the need to develop forms, instructions, and software under new guidelines." Energy Info. Admin.,

Several states subsequently established GHG registries that encourage firms to inventory and voluntarily reduce their emissions. Some make no mention of future credits. For example, in 1999, Wisconsin created a voluntary GHG emissions registry for Wisconsin businesses, using 1990 as the base year for emissions.¹⁰⁵ In 2004, the State began requiring facilities to report their CO₂ emissions if they emit more than 100,000 tons of CO₂ annually.¹⁰⁶ Yet the statute does not address whether companies will receive credit in the future for reductions made voluntarily. Other programs, however, explicitly authorize such credits.¹⁰⁷ The model rule adopted by the member states of the RGGI, for instance, includes a GHG emissions registry¹⁰⁸ and explicitly authorizes (though does not require) states to give companies credit for GHG reductions made during 2006, 2007, and 2008.¹⁰⁹

Some of the registries go further, suggesting that states will do their best to credit voluntary reductions should mandatory reductions ultimately be imposed by state or federal law. For example, in 2000,

Voluntary Reporting of Greenhouse Gases 2005, <http://www.eia.doe.gov/oiaf/1605/vrrpt/> (last visited May 1, 2007). For a compilation of the outdated reports, see Energy Info. Admin., Archived Versions of the Voluntary Reporting of Greenhouse Gases, http://www.eia.doe.gov/oiaf/1605/1605b_old.html (last visited May 1, 2007). In the last few years, several bills have been introduced in Congress to develop more rigorous national GHG registries, but none have passed. See Pew Ctr. on Global Climate Change, GHG Emission Reporting Proposals from the 109th Congress, http://www.pewclimate.org/what_s_being_done/in_the_congress/emreport.cfm (last visited May 1, 2007).

¹⁰⁵ S.B. 287, 1999–2000 Leg. (Wis. 1999) (codified at WIS. STAT. ANN. § 285.78 (West 2004)).

¹⁰⁶ See WIS. ADMIN. CODE NR § 438.03 tbl.1 (2007).

¹⁰⁷ Moreover, other states appear poised to create similar registries. For example, the Midwest Regional Greenhouse Gas Registry tentatively plans to cover Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. Midwest Regional Greenhouse Gas Registry, Project Overview (Mar. 22, 2006), http://www.ladco.org/reports/rpo/Regional%20Gas%20Registry/MW_RGGR-Project_Overview.pdf. The stated aims are to “facilitate corporate GHG management, provide for consistent accounting and reporting with other registries, encourage and certify voluntary emission reductions, and promote economic development.” *Id.*

¹⁰⁸ CO₂ BUDGET TRADING PROGRAM MODEL RULE §§ XX-5.3(c) (Reg’l Greenhouse Gas Initiative, Final Draft with Corrections 2007), available at http://www.rggi.org/docs/model_rule_corrected_1_5_07.pdf.

¹⁰⁹ *Id.* As noted above, the full RGGI trading regime is scheduled to commence on January 1, 2009. *Id.* § XX-1.5(c)(3). A draft version of the Model Rule, released in March, 2006, contained an identical registry provision. CO₂ BUDGET TRADING PROGRAM MODEL RULE §§ XX-5.3(c) (Reg’l Greenhouse Gas Initiative, Draft 2006), available at http://www.rggi.org/docs/public_review_draft_mr.pdf.

the California Assembly passed Senate Bill 1771,¹¹⁰ establishing the California Climate Action Registry to record and register voluntary GHG emissions reductions made by California entities since 1990. The statute explicitly provides that California will use “best efforts” to ensure that participating companies will receive “appropriate consideration” in federal or international regimes for baselines and reductions recorded in the state registry.¹¹¹

Similarly, in 1999, New Hampshire created a state GHG reduction registry, which was “intended to quantify and submit greenhouse gas . . . emissions reduction actions to a state database for safekeeping against some future federal requirements.”¹¹² This program reduced New Hampshire’s baseline for future federal regulation, with the explicit purpose of protecting companies making early cuts in GHG emissions from effectively being punished later.¹¹³ The statute there-

¹¹⁰ S.B. 1771, 1999–2000 S. (Cal. 2000) (codified as amended at scattered sections of CAL. HEALTH & SAFETY CODE (West 2006)).

¹¹¹ The bill provides as follows:

The state hereby commits to use its best efforts to ensure that organizations that establish greenhouse gas emissions baselines and register emissions results that are verified in accordance with this chapter receive appropriate consideration under any future international, federal, or state regulatory scheme relating to greenhouse gas emissions. The state cannot guarantee that any regulatory regime relating to greenhouse gas emissions will recognize the baselines or reductions recorded in the registry.

Id. at sec. 1, § 42801(e). In addition, the bill directs the agency in charge of the registry to “[r]ecognize, publicize, and promote participants that do any of the following: (1) Commit to monitor their emissions and set reduction targets. (2) Establish emissions baselines. (3) Report the quantity of their annual emissions progress.” *Id.* at sec. 1, § 42823(i). In 2001, California passed Senate Bill 527 to make minor adjustments to the climate registry program. S.B. 527, 2000–2001 S. (Cal. 2001) (codified as amended at scattered sections of CAL. HEALTH & SAFETY CODE (West 2006)). The bill directs the State Energy Resources Conservation and Development Commission to “[r]eview future international or federal [GHG reduction] . . . programs and make reasonable efforts to promote consistency between” them and California’s program. *Id.* at sec. 16, § 42870(f).

¹¹² New Hampshire Department of Environmental Services, New Hampshire Greenhouse Gas Registry (Dec. 12, 2005), <http://www.des.state.nh.us/ard/climatechange/ghgr.htm>.

¹¹³ The state described the goals of the registry as follows:

Prior experience under the federal Clean Air Act Amendments of 1990 led companies to be cautious about making voluntary GHG reductions. The emission reduction requirements required by the 1990 Amendments . . . effectively rewarded sources that had been dirtier or slower to clean up because they started off with more uncontrolled emissions, making percentage reductions easier to accomplish. To avoid a potentially similar catch-22 with GHG emission reductions, the NH Registry was developed to ensure to the greatest extent possible appropriate recognition of voluntary actions taken by New

fore allows companies to receive credit for reductions in GHG emissions made since 1990.¹¹⁴

Thus, most states and regional organizations appear to be advertising their registry programs, at least in part, as a way for firms to protect themselves from being assigned lower baselines later if they reduce GHG emissions now. Although the federal government established the first registry, the state programs likely have raised expectations among both environmentalists and industry about the prospect for future credits. The accounting systems of at least some of the state programs provide a more viable basis for calculating and allocating credits than the federal registry, which lacks comparable rigor.¹¹⁵

C. *An Increasingly Concerned Industry Lobby*

The current set of state initiatives is likely to unnerve industry. This is because of the apparent seriousness of a few states about reducing emissions, the targeting of products like fuels and automobiles, the complexity of the state initiatives when considered cumulatively, and the uncertainty about potential state efforts to come. As described above,¹¹⁶ a few states have actually established GHG reduction targets and delegated real authority to the implementing agencies to regulate both the electricity and transportation sectors.

Affected industries may also be impressed by the sheer range of policy approaches adopted by the states. Within the electricity sector,

Hampshire businesses, industries, and individuals to reduce GHG emissions. In the event that future GHG reduction targets are implemented, the NH Registry would help New Hampshire entities establish a baseline against which future federal greenhouse gas emission reductions may apply.

Id.

¹¹⁴ N.H. REV. STAT. ANN. § 125-L:2 (LexisNexis 2006).

¹¹⁵ This is indicated by the EIA's own description of its database:

While the information in the database may be used by the reporting entity to demonstrate achieved reductions of greenhouse gases, the program was not designed to support credit for early reductions or emissions trading programs. The program guidelines did not attempt to resolve the issues that arise in constructing the required reporting rules that would create a set of comparable, verifiable, auditable emission and reduction reports.

ENERGY INFO. ADMIN., *supra* note 102, at 77. The EIA database was not designed with nearly the capacity that most of the state programs have to actively monitor and accurately measure entities' reductions in GHG emissions. *See, e.g., id.* at 78 (noting that "[d]ouble reporting of emission reductions to the Voluntary Reporting of Greenhouse Gases Program can occur").

¹¹⁶ *See supra* Part II.B.

states aspire to regulate the mix of energy generation and total utility emissions, as well as the design of new and retrofitted power plants.¹¹⁷ Within the transportation sector, California seeks to regulate the fuel content and emissions technologies of automobiles, with other states poised to follow suit.¹¹⁸ Across both sectors, a number of states seek to induce firms to participate in new types of markets such as trading carbon and renewable energy credits.¹¹⁹

Firms operating in multiple states may well find that the states are adopting different approaches to achieve the same objective, making compliance confusing and potentially costly. Even within a given state's program, there are often uncertainties about how implementation will operate. These include matters such as which offsets will be acceptable to state oversight agencies, what the timetables for compliance will be, when utilities will be permitted to participate in either carbon or renewable energy credit trading, and what prices will be in these markets, among other things. This makes it difficult to plan for new plant construction, plant expansions and retrofits, product expansion into new consumer markets, and compliance in current markets.

To date, firms within the transportation sector have fared relatively better than those in the electricity sector, but they are appropriately concerned about what states might do in the future. This sector contributes nearly one-third of domestic GHG emissions. Although California is the only state that has attempted to regulate both tailpipe emissions and fuel content, there are signs that other states are not far behind.¹²⁰

In sum, the nature and variety of the state initiatives, whether intentionally or not, have created substantial uncertainty in a context in which firms must make long-term capital investments, and have raised the prospect of costly product differentiation because of heterogeneous schemes. These are precisely the circumstances under which, consistent with DPT, we would expect industry anxiety to be at its peak.

¹¹⁷ See *supra* Part II.B.1-3.

¹¹⁸ See *supra* Part II.B.5.

¹¹⁹ See *supra* Part II.B.1, II.B.4.

¹²⁰ See *supra* Part II.B.5.

D. *A Disappointed Environmental Lobby*

At the same time, state initiatives to date surely disappoint the environmental lobby. Despite what appears to be a flurry of activity, most states have done nothing to address GHG emissions from either electricity or the transportation sectors. California has yet to be granted the necessary EPA waiver for its GHG emissions standards for automobiles, and is tied up in litigation challenging the regulations.¹²¹ Should California's regulations fail to survive legal challenge, every state's efforts to adopt them will fail.

With respect to the electricity sector, fewer than half the states have adopted RPS approaches, and these approaches vary greatly in their targeted reductions and compliance deadlines. In addition, many RPSs have not addressed "leakage" issues (i.e., the possibility that regulation in one state will simply shift energy production and GHG emissions to another state not subject to limits), and attempts to do so by regulating out-of-state providers could lead to Dormant Commerce Clause challenges. Some RPSs permit the use of renewable energy credit trading, but the markets for these have not been developed. Moreover, even if states effectively implemented RPSs, they "should reduce emissions approximately 1%-1.5% below 'business as usual' by 2015-2020."¹²² This is hardly a reduction to write home about. Finally, the four states that set caps for either new or existing utilities must resolve how their programs will function in practice, including determining what type of offsets will count and what forms of participation in the renewable energy markets are permissible to meet the caps.¹²³

It will be years before the states work out the implementation details of their proposed programs. Although California is widely expected to adopt an emissions trading scheme to implement the Global Warming Solutions Act, the ARB (the agency responsible for promul-

¹²¹ See *Cent. Valley Chrysler-Jeep v. Witherspoon*, 456 F. Supp. 2d 1160, 1174 (E.D. Cal. 2006) (holding that automobile manufacturers state a claim that the EPCA preempts California's regulations); *Green Mountain Chrysler Plymouth Dodge Jeep v. Dalmasse*, No. 05-CV-302, 2006 WL 3469622, at *2 (D. Vt. Nov. 30, 2006) (describing an auto industry claim that the Clean Air Act preempts Vermont's adoption of the California tailpipe regulations).

¹²² Kirsten H. Engel, *State and Local Climate Change Initiatives: What Is Motivating State and Local Governments To Address a Global Problem and What Does This Say About Federalism and Environmental Law?* 14 (Ariz. Legal Studies Discussion Paper No. 06-36, 2006), available at <http://ssrn.com/abstract=933712>.

¹²³ See *supra* Part II.B.2-3.

gating regulations) has yet to specify its plan. Among other things, it has not delineated the scope of economic activity to which the regulations will apply. The task before the ARB is enormous, and substantial uncertainty exists about all of the hard issues—scope, cost, and allocation of regulatory burden. For their part, the RGGI states have developed a governance structure to resolve future uncertainties. Nevertheless, the cooperative functioning of a regional organization of states could be challenging to maintain over time, especially when participation is voluntary.

E. *Hitting the Regulatory Sweet Spot*

Thus, the states have hit the regulatory sweet spot for stimulating an appeal to the federal government: just enough inconsistency, uncertainty, and potentially costly product regulation to frighten industry, yet insufficient progress to satisfy environmental interest groups.¹²⁴ Indeed, the states' strategy appears to come right out of a playbook for how to provoke defensive preemption. For example, California targeted automobile tailpipe emissions for regulation and the auto industry responded predictably, by challenging the regulations on preemption grounds.¹²⁵ At the same time, firms from other sectors, such as utilities and manufacturing, have appealed to the federal government for a uniform federal approach, citing the uncertainty created by inconsistent state regulatory regimes.¹²⁶ For the electricity sec-

¹²⁴ Of course, the state initiatives may do other things as well. For example, they do allow for experimentation with different approaches. As the states try different permutations and combinations of climate measures—RPSs, low-carbon fuel regulation, building efficiency standards, and cap-and-trade programs (which themselves vary on such things as point of regulation and offsetting)—they will undoubtedly produce useful information for both other states and the federal government on how best to reduce emissions effectively and efficiently. Thus, state activity on climate may be a good example of Brandeisian experimentalism. In addition, state-level regulation can help to demonstrate that compliance is not as difficult or as costly as industry claims, which can help undermine arguments against a broader national program. State initiatives—themselves a response to voter demand—might build additional demand for more climate measures by attracting increased media attention to the problem, or by demonstrating to risk-averse politicians that they too might find ways to capitalize on it.

¹²⁵ See *supra* Part II.B.5.

¹²⁶ Felicity Barringer, *A Coalition for Firm Limit on Emissions*, N.Y. TIMES, Jan. 19, 2007, at C1 (discussing the formation of a coalition of industry leaders asking Congress to pass climate legislation and expressing concern about state regulation). The group consists of ten companies with operations across different sectors of the economy, including GE, Alcoa, BP, Lehman Brothers, and several utilities—a diverse coalition, though notably no auto manufacturer is included. They are asking for a national limit on CO₂, citing a concern that “various state efforts, if not coordinated, could lead to a

tor in particular, the prospect of making enormous capital investments in next-generation coal plants that may last a half century likely contributes significantly to their desire for a single regulatory regime. Federal standards would also help to spread the cost of GHG regulation across a greater number of states. This would relieve industries in the leading states from being disadvantaged by unilateral state regulation.¹²⁷

Of course, the 2006 mid-term elections improved the prospects for climate legislation by putting Democrats in control and replacing outspoken opponents of GHG regulation (who occupied key leadership positions) with active supporters of federal legislation.¹²⁸ In light of this, one might argue that industry's support for a federal climate regime is not a driver of the federal policy response, but rather a reaction to a new political reality in which such regulation appears inevitable. Yet this oversimplifies a complicated dynamic. The better view is that industry pressure in response to state activity can help increase the prospects of legislation that, as the likelihood of its passage grows, in turn drives industry to engage even more intensely in efforts to shape it. So although industry will rarely be the sole impetus behind federal regulation, the intensity of its opposition helps to determine the timing of federal regulation (even regulation that might ultimately happen anyway). State regulation can be critical to weakening that opposition and generating affirmative support. That is, even a Democratic Congress would hesitate longer to regulate GHG emissions if members faced a united front of vociferous opposition from a cross-section of the most powerful U.S. industries.

Further supporting this view, by the time Congress changed hands in 2006 there had already been signs behind the scenes of weakening industry opposition to climate regulation and growing support for a

scattershot system of regulation." *Id.* The group worked with the World Resources Institute, Environmental Defense Fund (EDF), and Natural Resources Defense Council (NRDC), along with the Pew Center for Global Climate Change, to develop a set of principles and legislative goals. *Id.*

¹²⁷ See Mouawad & Peters, *supra* note 24 (quoting the president of the California Manufacturers and Technology Association saying, "We think it is draconian . . . for the state of California to put these California-only rules [into effect] when companies outside of the state will not have the same restrictions and costs imposed on them").

¹²⁸ In the most dramatic such shift, Barbara Boxer (D-CA) replaced James Inhofe (R-OK) as Chair of the Senate Environment and Public Works Committee. Senator Inhofe had famously commented that global warming was "the greatest hoax ever perpetrated on the American people." 149 CONG. REC. S10012, 10022 (daily ed. July 28, 2003) (statement of Sen. Inhofe).

federal approach, which we attribute in significant part to state activity.¹²⁹ Several prominent industry leaders had come out in favor of federal legislation even before the Congressional turnover.¹³⁰ Moreover (and consistent with the predictions of DPT), a number of the bills introduced in the 109th Congress had already called for cuts in GHG emissions at rates generally less aggressive than were being proposed in California, which suggests that industry was trying to undermine the most rigorous state standards by seeking federal preemption.¹³¹ Generally, the bills introduced in the 109th Congress did not explicitly adopt preemptive provisions, but it is hard to imagine that industry was not already thinking about preemption behind the scenes.¹³² This is a natural inference to draw from the repeated citing of inconsistent state regulation as the motivation for supporting a federal law.¹³³

The automobile industry signaled its preference for preemption by attacking California's tailpipe regulations in the courts.¹³⁴ And by mid-2006 it was clear that industry groups in other sectors, including

¹²⁹ The desire for certainty in the face of needing to make large capital investments moved a number of industries to seek a federal response even before Congress changed hands in 2006. "The utilities are looking at thirty year investments—the Democratic takeover is minimally important to this." Interview with former Dep't of Energy official (anonymous per request) (Mar. 12, 2007) (notes on file with authors).

¹³⁰

"Any action taken on a regional or a state level we believe will create a policy patchwork that is more costly and less effective than a comprehensive national policy would be," said Elizabeth Bennett, Duke Energy spokeswoman, last week. "We feel very strongly that direct federal action is necessary." For firms operating in multiple states, said PG&E's [Environmental Director, Wendy] Pulling, "it's just a lot more cost effective operating by one set of rules."

Ian Hoffman, *State Drives Feds on Climate, Lags on Gas Emissions: Schwarzenegger, Officials Back Strong Greenhouse Curbs by 2012 for California*, OAKLAND TRIB., Apr. 26, 2006, available at NewsBank. Both PG&E and Duke Energy also supported a uniform and presumably preemptive approach. *Id.*

¹³¹

Id.

¹³² Industry trade groups always knew they would seek preemption (in whole or in part) of state regulation, but did not engage fully until the momentum started to build and efforts turned serious. Interview with former Dep't of Energy official, *supra* note 129.

¹³³ See Hoffman, *supra* note 130 ("State agitation for tougher laws routinely has sent industry to Capitol Hill seeking uniform, federal regulation to preempt the state rules.").

¹³⁴

See *supra* Part II.B.5.

electricity generation, would seek relief from Congress sooner rather than later.¹³⁵

In sum, our point is not that industry demand is solely responsible for federal regulation, but that state regulation can prompt industry players to support a federal policy response sooner than they otherwise might have, increasing the likelihood of its passage.

Indeed, so effective have the states been at creating conditions that would induce industry appeals for federal action that one wonders if this was an intentional strategy on the part of the states. On this the evidence is mixed. Clearly, some state-level actors have consciously sought to provoke the federal government. For example, in *Massachusetts v. EPA*, a coalition of states and environmental groups successfully sued the EPA, challenging its refusal to regulate CO₂ and other GHGs under the Clean Air Act.¹³⁶ Another such coalition challenged the EPA's refusal to set New Source Performance Standards under the Act to regulate CO₂ emissions from power plants (a case whose outcome may be affected by the Supreme Court's ruling in *Massachusetts v. EPA* that the EPA has authority to regulate GHGs).¹³⁷ And a group of states is seeking injunctive relief in a public nuisance action against the major power plants responsible for global warming pollution (a case whose outcome may be affected by the Court's holding in *Massachusetts v. EPA* that states have standing).¹³⁸ All of this litigation was of course coordinated; it appears to be designed in substantial part to motivate Congress to act. Yet there is no evidence that the states leading the charge on GHG regulation (e.g., California, the RGGI coalition, Washington, Oregon, etc.) are consciously coordinat-

¹³⁵ Preemption is clearly on the table in the 110th Congress: Senator Feinstein introduced a bill aimed at reducing GHG emissions by regulating the electricity sector, a draft of which contained a provision "exempting" the industry from state regulation. And although she deleted the provision after heavy lobbying by California officials who do not want to see their own recently passed legislation preempted, she said she would be reconsidering it. See Janet Wilson & Richard Simon, *Feinstein, Boxer Differ on Global Warming*, L.A. TIMES, Jan. 18, 2007, at B1. Feinstein's legislation, introduced on January 17, 2007, calls for a cap-and-trade approach to the electricity sector and proposes to reduce emissions by 25% below projected levels by 2020. Feinstein's bill is endorsed by an electricity industry group that includes PG&E, whose CEO joined her at her news conference. Feinstein said that the companies had "pushed for preemption." *Id.*

¹³⁶ See *Massachusetts v. EPA*, 127 S. Ct. 1438, 1446, 1463 (2007).

¹³⁷ See Petition for Review, *New York v. EPA*, No. 06-1322 (D.C. Cir. Apr. 26, 2006), available at http://www.oag.state.ny.us/press/2006/apr/Petition_for_Review.pdf.

¹³⁸ *Connecticut v. Am. Elec. Power Co.*, 406 F. Supp. 2d 265, 267-70 (S.D.N.Y. 2005), *appeal docketed*, No. 05-5104 (2d Cir. Sept. 22, 2005).

ing their *lack* of consistency in regulatory approach in order to prompt appeals for defensive preemption.¹³⁹

In any event, such coordination would be difficult. In their approach to regulation, state governments must respond to internal political dynamics, including the preferences of state-level interest groups, and internal economic imperatives, which differ from state to state. There may be practical, technological limits on the extent of regulatory diversity that states could achieve when they are each trying to solve the same problem. Environmentalists and their allies must also compromise to get measures passed at the state level. This might limit their ability to choose those measures that, when combined with the regulatory output of other states, maximize regulatory heterogeneity. Pro-regulatory interest groups will not seek to maximize interstate regulatory heterogeneity at all costs, especially if doing so would compromise their chances of successfully adopting regulatory measures at the state level. Yet whether conscious or not, the states' cumulative efforts have made industry exceedingly uncomfortable.

At the same time, the states have failed to satisfy environmentalists. Demand for a federal policy response arises in this case neither because of an interstate race to the bottom nor because of ISEs. These explanations do not apply in the case of climate change. RBT lacks explanatory power because all of the states are technically "at the bottom" when it comes to controlling GHGs, and the federal government has not set a floor toward which states could race downward.¹⁴⁰

¹³⁹ Some state-level actors, such as Assembly Speaker Fabian Nuñez, a sponsor of California's global warming legislation, have publicly stated that their intention in proposing state regulation is to spur national regulation. See Juliet Eilperin, *California Tightens Rules on Emissions*, WASH. POST., Sept. 1, 2006, at A1. Yet this is different from actively promoting inconsistency in the hope of being preempted. Indeed, some state-level actors have expressed displeasure at the prospect of federal preemption that would undercut the California standards. For example, Speaker Nuñez strongly opposed the inclusion of a provision in Senator Feinstein's climate bill that would exempt California utilities from state regulation. Wilson & Simon, *supra* note 135.

¹⁴⁰ The historical context in which scholars developed the race-to-the-bottom literature reveals why its explanatory power might be limited: it emerged against the backdrop of the Reagan administration's efforts to devolve regulatory policymaking to the states. Thus, RBT can be understood as a response to that proposition—a hypothesis about what would happen if states were not "propped up" by a minimum federal floor. As a result, the theory assumes a starting place from which an interstate de-regulatory competition might begin and then explores whether the outcome of such a competition justifies a continuing federal role. Yet these conditions will not always obtain. In the case of newly recognized environmental problems, for example, states may find themselves all equally "at the bottom" and without any federal guidance. In such

Nor does the traditional ISE rationale for why state and local officials might seek federal intervention (i.e., to address pollution from other states) apply—generally, GHGs do not have adverse local effects. As a result, the demand for federal GHG regulation appears motivated by something else: the recognition that the nature of climate change requires a national (and ultimately global) response. In short, the states have failed to satisfy environmentalists because they cannot. Existing state-level measures are currently minimal and uncertain, but even if they were more developed, their potential effectiveness in the absence of a federal regime remains speculative at best. Moreover, only once the United States has made a domestic commitment to address climate change is it best positioned (and more likely) to enter an international agreement to make binding emissions reductions globally.

Thus, there are at least three reasons why environmentalists and first-mover states (those that choose to regulate GHGs before the federal government acts) might seek federal standards. First, federal minimums could increase aggregate reductions of GHGs, helping to solve the regulatory problem that states cannot solve on their own (which, as in the case of ISE theory, involves a collective action remedy). Second, first-mover states might advocate for federal standards to spread the cost of GHG regulation, in order to relieve the burden on state industries that might otherwise be disadvantaged vis-à-vis their out-of-state competitors (a version of the concern in RBT that states acting unilaterally may be disadvantaged). Finally, first-mover states may seek federal regulation to increase the demand for substitute products or emissions control technology that their states are well positioned to provide.

III. THE FORM OF FEDERAL REGULATION

A. *Three Influential Factors*

The analysis thus far explains how states can affect the timing of a federal legislative response but says nothing about its form. As noted earlier, there are a number of tools Congress might adopt to address environmental problems, including performance standards, design standards, market mechanisms (such as emissions trading), and taxes. Based on the climate change example, we argue that although states

a case, RBT cannot explain the demand for federal minimums simply because there is no race to prevent.

can have a significant catalytic effect on the demand for federal legislation (by stimulating pro-regulatory demand, defensive preemption, or both simultaneously), they have less to do with its content. The climate change example shows that state regulation can have some effect—for example, by helping to create path dependence for certain policy tools—but that far more influential are three other factors: the goals of key interest groups, the physical and technical properties of the regulatory problem they face, and the compatibility of the potential points of regulation (what we call “regulatory nodes”) with available regulatory tools.

B. *Interest Group Preferences for Policy Instruments in Context*

That key interest groups influence the content of federal legislation is neither surprising nor new.¹⁴¹ As we would expect, interest groups will support policy tools that best accomplish their aims. In environmental regulation, the general aims of the relevant interest groups are fairly plain: Environmentalists (i.e., pro-regulation forces, treated collectively) can be expected to support forms of regulation that will be effective in achieving the chosen regulatory standard (which they prefer to be stringent), and reasonably easy to monitor and enforce. At the same time, regulated industry (i.e., those who bear the burden, treated collectively) will generally prefer policy instruments that give them maximum flexibility and reduce their aggregate costs of complying with the chosen regulatory standard (which they prefer to be weak).

Of course, such generalizations are suspect. To speak of “environmentalists” or “industry” as if these were monolithic categories oversimplifies a much more fractured and nuanced reality.¹⁴² Still, for

¹⁴¹ See Nathaniel O. Keohane, Richard L. Revesz & Robert N. Stavins, *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313, 346-57 (1998) (discussing the demands of firms, environmentalists, labor, and consumers, and the effects of these demands on environmental regulation); see also ACKERMAN & HASSLER, *supra* note 1, at 44 (describing the “carefully coordinated lobbying effort” during the drafting of the 1977 Clean Air Act amendments).

¹⁴² Environmentalists can be divided along many lines (e.g., national versus local and single-issue versus multiple-issue organizations). Some groups lobby, others litigate, still others focus on policy analysis, and some do all three. In addition, of course, the environmentalist category can be further divided into many dots on the ideological spectrum, ranging from what might be called “radical” to “pragmatic.”

The same variability is true of “industry,” which of course can be divided into different sectors of the economy, as well as into larger versus smaller firms, existing firms versus new entrants, heavily regulated versus less intensively regulated industries, and

our purpose here, which is to shed light on the determinants of a specific federal policy response, it is useful to think in terms of the more simplified categories. Environmentalist preferences are meaningfully different from industry preferences at the most fundamental level, and this is relevant to predicting what policy tools the two “sides” will support under particular circumstances. While this is not fine grained enough to tell us everything, it is fine grained enough to tell us something about the form federal regulation will take.

1. Environmentalists

Generally, we would expect environmentalists to prefer policy instruments that establish specified reductions in the pollutant responsible for the environmental harm with the greatest certainty possible and in a manner that both minimizes opportunities for noncompliance and maximizes transparency. Presumably, to accomplish the goal of maximum reductions, environmentalists would also support policies that create dynamic incentives for firms to quickly develop and adopt the most effective pollution-control technologies.

As noted above, environmentalists traditionally have preferred prescriptive command-and-control instruments, such as performance standards and design standards, to market instruments, such as trading schemes or taxes.¹⁴³ Why? Part of the explanation lies in an initial ideological hostility to the notion of pollution “rights”¹⁴⁴ that such

so on. Moreover, not all firms—even those of comparable size within the same sector—adopt the same attitude toward environmental regulation. This is not just a matter of their strategic position vis-à-vis their competitors, though this is certainly a factor. Firms, like other organizations, have cultures, histories, and different styles of leadership that inflect their approach to their bottom line. As a result, one finds a range of attitudes across industry that, as with environmentalists, might be categorized along a spectrum from “radical” to “pragmatic.”

¹⁴³ See Richard J. Lazarus, *The Tragedy of Distrust in the Implementation of Federal Environmental Law*, LAW & CONTEMP. PROBS., Autumn 1991, at 311, 362-63 (1991) (“Many . . . environmentalists commonly equate any consideration of economics . . . or the use of market incentives [instead of command-and-control schemes] . . . with caving in to industry.”). It is always risky to generalize. Although it might be true that environmentalists have historically tended to favor command-and-control instruments, there have been exceptions. For example, the EDF was an early proponent of a market approach to acid rain. See Paul L. Joskow & Richard Schmalensee, *The Political Economy of Market-Based Environmental Policy: The U.S. Acid Rain Program*, 41 J.L. & ECON. 37, 48 (1998).

¹⁴⁴ See Keohane et al., *supra* note 141, at 354-55 (observing that many environmental groups, with the exception of EDF, viewed the allocation of pollution permits as giving firms a license to pollute).

markets seem to create. Yet some opposition is undoubtedly due to concern about the performance of markets: even poorly designed market instruments can be more cost effective if they work, but *whether* they work depends on a number of factors. In the case of cap-and-trade, such factors include the stringency of the overall cap, its stability over time, the permit allocation strategy, and the plan (if any) for allowing banking and calculating offsets.¹⁴⁵ From an enforcement perspective, environmentalists might prefer performance or design standards, which effectively require every regulated firm to install emissions control technology. It may be harder, by contrast, to trust a trading scheme that—although intended to ensure absolute emissions limits—remains vulnerable to numerous design flaws that could undermine the integrity of a hard constraint.¹⁴⁶

The historical environmentalist preference for command-and-control instruments can also be explained to a significant extent by the physical and technical nature of the environmental problems addressed in the past. Most pollution causes harm by way of local exposures. As a result, environmentalists have quite reasonably preferred regulatory instruments that can, at a minimum, improve conditions locally (e.g., by improving ambient air or water quality). This is just a way of saying that environmentalists prefer tools such as performance or design standards linked to ambient standards that will actually address the problem where it arises, while avoiding concentrations or “hot spots.” Thus, the preference for particular regulatory instruments is likely to be in part a function of the nature of the pollutant responsible for the environmental harm.

Yet GHG emissions that lead to global warming are different from conventional pollutants. They do not cause harm primarily as a result of local exposures, but because of the stock of GHGs that accumulate

¹⁴⁵ See *Global Climate Change: Hearing Before the Subcomm. on Energy & Air Quality of the H. Comm. on Energy & Commerce* (2007) (statement of Dallas Burtraw, Senior Fellow, Resources for the Future) [hereinafter *Global Climate Change*], available at http://www.rff.org/Documents/RFF-CTst_07-Burtraw; see also CONG. RESEARCH SERV., CLIMATE CHANGE: THE EUROPEAN UNION'S EMISSION TRADING SYSTEM (EU-ETS) 21 (2006) (discussing the importance of setting appropriate allowances and prices).

¹⁴⁶ In addition, some of the perceived advantages of market instruments may not be as great as imagined. For example, market instruments are often touted as being transparent and easy to monitor because both the initial allocations and the subsequent trading are public. Yet command-and-control systems can be made fairly easy to monitor as well, by merely checking whether certain pollution control equipment has been installed and is operational. The Clean Water Act's effluent monitoring requirements, for example, make it fairly easy to determine when firms violate their permits.

in the atmosphere regardless of where the gases are emitted. Nor do they cause interstate spillovers in the traditional sense, by shifting harmful pollutants from one (usually upwind) jurisdiction to another (usually downwind). Unlike acid rain or the pollutants that create smog, it matters not for global warming whether one is a downwind or an upwind state. Rather, global warming is more like the destruction of the ozone layer—it creates externalities on a global scale.

Thus, we would expect environmentalists to overcome their traditional objections to market instruments in the face of this very different kind of problem. In theory, they should be less concerned with the spatial distribution of the reductions—in particular, the problem of “hot spots”—which in turn ought to lead them to be more favorably disposed to economic instruments. The goal of maximum total reductions will best be furthered by policy instruments that are cost effective—meaning they achieve a given reduction at the lowest aggregate social costs—because industry is more likely to agree to a lower level of total emissions when the chosen policy instrument allows for compliance in the lowest-cost manner. Thus, if market-based policy instruments are more cost effective than command-and-control instruments, as the economics scholarship claims,¹⁴⁷ then environmentalists should in theory support them in the interest of achieving deeper overall cuts. Moreover, we would expect environmentalists to support market instruments in this instance because they create the largest incentives for new technology adoption and diffusion.¹⁴⁸

Yet which specific approach among the available market mechanisms should environmentalists support in the context of a “stock” pollutant like GHGs? The answer is that only a cap-and-trade regime addresses their preference for tools that establish an overall constraint with some temporal stability. Neither command-and-control policies nor tax policies even attempt to guarantee a prespecified total reduction. To the contrary, under these approaches, the total amount of pollution released will vary with the number of plants, as output changes in response to market conditions. Individualized plant-level controls, even if fully enforced, will not guarantee an aggregate limit on pollution unless the government is willing to cap the number of plants and prohibit new growth. By contrast, a tradable permit system establishes an absolute cap that is designed to ensure that whatever the distribution, total emissions will not exceed a prescribed level.

¹⁴⁷ *E.g.*, Keohane et al., *supra* note 141, at 313-14.

¹⁴⁸ *Id.* at 314.

This is not to suggest that caps will always work as advertised. It is possible, for example, to undermine the integrity of a cap—to render it more of a flexible guideline, rather than a hard constraint—by misallocating permits, allowing dubious offsets or credits, setting a “safety valve” price too low, or by simply failing to signal to the market that government is committed to reductions over the long term.¹⁴⁹ Still, cap-and-trade is the only policy instrument that at least requires policymakers to articulate an explicit limit on total pollution.

Nevertheless, there are reasons why environmentalists might support other tools as well. First, some environmentalists will prefer regulatory tools that will deliver the most “collateral” benefits—that is, regulations designed for one purpose (e.g., to ameliorate global warming) that can be leveraged to improve another environmental problem (e.g., smog). For example, environmentalists might lobby for higher fuel efficiency standards in lieu of an approach that might generate greater overall GHG reductions, because fuel efficiency standards have the fringe benefit of reducing conventional tailpipe pollutants (which have proved to be difficult to regulate by other means and which contribute greatly to smog in densely populated areas). Second, to some extent, environmentalist preferences for one tool over, or in addition to, another might be influenced by ideology. It is conceivable, for example, that some support for higher fuel efficiency standards would be motivated as much by a desire to curb the American appetite for automobiles as it is by the desire to reduce GHGs per se.

Thus, in the climate change context, we see that the nature of the regulatory problem undermines some of the traditional reasons for environmentalist opposition to market approaches. Moreover, we see why cap-and-trade in particular (as opposed to taxes) might be especially attractive as a form of regulation. Although we cannot rule out environmentalist support for other instruments as well, especially those that accomplish collateral or ideological goals, most mainstream environmentalists should, at a minimum, support cap-and-trade regulation of GHGs.

¹⁴⁹ See *Global Climate Change*, *supra* note 145 (referring to the short time horizon of the European Union’s carbon market).

2. Industry

What form of federal regulation would industry prefer in the climate change context?¹⁵⁰ For simplicity, we focus here on the two categories of regulated industry that produce the majority of domestic GHGs: electric utilities (33% of GHGs) and transportation (28% of GHGs).¹⁵¹ The overall objective of these industries is, as always, to avoid losses. Thus, they will generally prefer regulatory tools that help them to minimize abatement costs and position them favorably vis-à-vis their competitors. Firms will disfavor command-and-control regulation that limits flexibility by, for example, specifying design standards or effectively requiring the universal adoption of particular technologies without regard to marginal cost. Thus, the two regulatory tools that best satisfy industry preferences in the context of climate regulation are a cap-and-trade approach and taxes.¹⁵² Both are more cost effective than command-and-control regulation, yet of the two, we would expect a stronger industry consensus to emerge in favor of cap-and-trade. Why? There are three primary reasons.

The first is the potential cost of taxes. Although taxes are more cost effective from a societal perspective, for industry they may be more costly than a cap-and-trade regime, depending on how government recycles the revenue stream.¹⁵³

Second, cap-and-trade programs, unlike taxes, offer opportunities for rent seeking in the form of permit allocation based on historically high emissions rates, credits for past good behavior, and opportunities to take advantage of cost-containment measures such as offsets. In a cap-and-trade regime, either Congress itself or an agency to which Congress delegates authority must initially allocate the permits (which are entitlements to emit GHGs up to a certain amount). Permits can be granted on the basis of historical emissions rates (a process known

¹⁵⁰ Again, our use of the term “industry” includes diverse firms in different sectors of the economy—firms that will have different reactions to the prospect of federal regulation in general, and to the details of how a cap-and-trade program in particular will be designed, because they may be differently positioned to benefit or suffer economically. *See supra* notes 24 & 142.

¹⁵¹ *See* U.S. ENVTL. PROT. AGENCY, *supra* note 24, at ES-14.

¹⁵² *See* Keohane et al., *supra* note 141, at 347-49, 351 (claiming that firms generally prefer regulatory tools that (1) impose the lowest aggregate cost on industry, (2) create profits for existing firms by increasing price more than marginal cost and creating barriers to entry, and (3) impose minimal costs on that firm while imposing higher costs on other firms).

¹⁵³ *See id.* at 347-48.

as grandfathering), auctioned to the highest bidder, or distributed according to some combination of the two. Where a significant portion of the permit allocation is based on grandfathering, firms receive substantial rents that cannot be obtained through a pollution tax system. Compared to a program in which firms must pay taxes on residual emissions, grandfathered firms might have to pay little or nothing for permits to cover their emissions. In addition, grandfathering may give incumbent firms an advantage over entering firms by restricting entry into the industry. This is because incumbent firms may receive at least some of their permits for free while new entrants would have to pay the market rate. Moreover, unless some allocations were held back for new entrants, entering firms would have to buy their permits from incumbent firms, creating a direct transfer of resources to the incumbent firms from the entering firms. For these reasons, firms often prefer cap-and-trade programs to taxes; indeed, in the past, Congress has used grandfathering as a political tool to build support for the regulatory program by essentially “buying off” high-polluting firms.¹⁵⁴

Third, state and federal GHG registries have raised industry’s expectations that firms will receive some credit for their early voluntary reductions when a mandatory federal regime emerges.¹⁵⁵ This has helped to build support for cap-and-trade among industry as the regulatory tool of choice.

For these reasons, we would, at a minimum, expect incumbent firms that have participated in voluntary reduction programs to vigorously lobby for a cap-and-trade approach, so long as grandfathering is a feature of its design. Support for such a scheme will likely be much broader than this, however, extending to any firms that stand to gain from the allocation system, especially historically high emitters. This helps to illustrate how the prospect of grandfathering generally can lead firms to support cap-and-trade over taxes. It also shows how early government initiatives (such as the federal and state registry programs) are not neutral with respect to their impact on the choice of

¹⁵⁴ See Joskow & Schmalensee, *supra* note 143, at 55 (commenting that although the permit allocation provisions in the Clean Air Act Amendments governing sulfur dioxide trading “have generally been described as following a simple rule, it is clear that the actual allocations were significantly influenced by special interest rent seeking”).

¹⁵⁵ For example, the Clinton administration’s Climate Change Action Program created expectations among industry participants that early GHG reductions could lead to credits. See Thomas P. Lyon, “Green” Firms Bearing Gifts, *REGULATION*, Fall 2003, at 36, 39-40 (describing voluntary programs and their effect on future expectations).

federal policy instrument—they can create path dependence for a particular form of regulation.

C. *Matching Regulatory Tools to Regulatory Targets*

To fully explain why Congress might choose one form of federal regulation over another, however, we must take account of yet another factor: the compatibility of different “nodes” of regulation with the different regulatory tools under consideration.

When regulating GHG emissions, the federal government could focus its regulatory efforts on a variety of targets that can be thought of as “upstream” and “downstream” in the supply chain. For example, in the transportation sector, oil importers are upstream, oil refiners are midstream, and gas stations are downstream; in the electricity sector, raw fuel suppliers are upstream and power plants are downstream; and of course, for each sector respectively, consumers who fill their cars with gasoline and consumers who turn on the lights at home are the furthest downstream of all. Certain policy tools will work well for some of these nodes of regulation, but not for others.

The supply chain represents the set of vertically aligned industries involved in supplying a product to consumers—a product that, in this context, produces global warming. The feasibility of specific policy instruments, and therefore the likelihood that they would be chosen as the federal policy response, depends to some extent on the properties of each “node” within the supply chain. Both the transportation and electricity sectors contain numerous nodes. This is because both fuel and electricity (which are types of products) are inputs into other products, such as vehicles, homes, and businesses. As a result, government can choose to regulate at any number of potential nodes.

Some regulatory tools cannot be feasibly applied to a given point of regulation in the supply chain. For example, a tradable permit scheme will not work especially well if applied to the millions of Americans who own automobiles. The market would be too large, the targets too mobile, and the trades too difficult to monitor, among other things. On the other hand, a tradable permit scheme that covered a few hundred power plants with high GHG emissions might work very smoothly. In short, there are matches and mismatches when it comes to regulatory targets and regulatory tools. This compatibility factor is another important determinant of the form of federal regulation. As we show below, this can help to explain why industry preferences for particular regulatory tools in the two sectors we

have identified—the electricity sector and the transportation sector—could diverge under some circumstances.

Yet it is not just the technical properties of the nodes that matter. The choice of instrument is influenced by the political struggle over where to place the regulatory burden. Interest groups at each point in the supply chain wish to avoid regulation to the extent possible and seek to shift the associated costs to another point instead. Thus, the battle over where to regulate will be influenced by the relative political power of the regulatory targets. For example, in the transportation sector, whether oil refiners upstream (through clean fuel requirements) or auto manufacturers downstream (through fuel efficiency standards) will bear the brunt of regulation depends on the relative political power of the two industries. And this political struggle in turn has implications for the *form* of regulation, as we explain below.

Within the transportation sector, regulation to control GHG emissions could be imposed at any or all of four different nodes: (1) the point of extraction or importation of fuel, (2) the point of refining fuel, (3) the point of retail purchase of fuel, and (4) the point of fuel combustion (i.e., through the vehicle that utilizes the fuel). Some types of policy instruments will work better than others when targeted at these different nodes in the supply chain.

To illustrate, consider the compatibility of these potential targets with four types of policy instruments: a tradable permit system, a product design standard, an emissions standard, and a carbon tax. A tradable permit system is more compatible with upstream than downstream regulation. The upstream nodes consist of industries containing a few relatively large firms that have the capacity to participate in permit trading with relatively low transaction costs. In contrast, a tradable permit system for gas stations and vehicle owners would be less feasible because these points of regulation involve many more participants with lower capacity to participate in a new market and much higher transaction costs in the aggregate.

Product design standards that modify the carbon content of fuel can only be feasibly implemented at the midstream nodes where the fuel is produced and refined. This is not to say that the *effects* of such regulation would be limited to these nodes—mandates for low-carbon fuel blends would clearly affect fuel refineries and might also force the redesign of the vehicles in which these new blends must be burned, indirectly affecting auto manufacturers further downstream. Federal regulators could impose product design standards more directly on the vehicle manufacturers downstream, however, even with-

out regulating fuel composition upstream. The most obvious example of such downstream regulation is fuel efficiency standards (i.e., CAFE), which can force auto manufacturers to redesign cars. Another option would be to set tailpipe emissions standards for CO₂, as California has done. Like CAFE standards, emissions standards impose the regulatory burden downstream, on auto manufacturers, by affecting vehicle design. A carbon tax, by contrast, could be levied at any node within the fuel supply chain, although its administration would likely be least costly if imposed upstream where there are fewer firms.

The same point can be made by examining the available nodes of regulation within the electric power sector. In this sector, carbon-reducing regulation can be imposed on (1) firms that extract or import raw fuels such as coal, natural gas, or oil, (2) electricity generators, (3) local utilities that sell electricity to consumers (when they are distinct entities from generators), or (4) energy-consuming appliances, equipment, and buildings.¹⁵⁶

Again, certain policy instruments would be easier to implement at some nodes than others. For example, a tradable permit system could be applied either to the carbon content of the fuels sold to electricity generators or to the carbon emissions that result from electricity generation. Alternatively, a permit system could be applied to the carbon content of the electricity sold by retail utilities. A performance standard for carbon emissions can *only* be imposed on electricity generators because only the generators actually produce the emissions. As in the transportation sector, a tax could be applied at any point in this supply chain.

Notice that most of the policy instruments discussed so far for the transportation sector impose the regulatory burden on either the petroleum industry (in the upstream portion of the supply chain) or on the automobile manufacturing industry (occupying the downstream portion of the supply chain). Naturally, neither industry wants to bear the bulk of the regulatory burden.

Conceivably, there could be a similar battle in the electricity sector between raw energy suppliers (in the upstream portion of the supply

¹⁵⁶ The choice of point of regulation is made somewhat more complicated in this sector because some states are deregulated and others are not. In some states, the same firms both generate and sell electricity, while in other states, firms are clearly segregated into either generation or retail sales. Still, it is possible to impose a regulation on either generation or the sale of electricity. See LARRY PARKER & JOHN BLODGETT, CONG. RESEARCH SERV., *ELECTRICITY RESTRUCTURING: THE IMPLICATIONS FOR AIR QUALITY* 26, 29 (2001).

chain) and electricity generators (in the downstream portion of the supply chain). Such political struggles ultimately determine the point or points of regulation. It appears that of the two contenders in the electricity sector, the generators are poised to bear the brunt of the regulation. This is not surprising—historically, power generators have been the “natural” targets of regulation in the supply chain in this sector. They are already heavily regulated under the Clean Air Act and many have participated in the sulfur dioxide trading program.¹⁵⁷ The picture in the transportation sector is somewhat less certain. This is in part because states have focused fewer of their initial regulatory efforts on transportation.

To predict the outcome of such struggles accurately, however, we would need to know more about the relative power of the key industries. For our purposes, these political struggles over potential points of regulation are important because they strongly influence the choice of regulatory tool. The outcome of the political battle over *where* to regulate within the supply chain also necessarily affects the choice of *which* instrument to use. In the transportation sector, should auto manufacturers prevail, we would be less likely to see CAFE standards; should the oil refiners prevail, we would be less likely to see product design standards that regulate the carbon content of fuel.

Should the regulatory burden in the electricity sector fall primarily on the power generators, the prospects for a tradable permit system will increase. This regulatory tool is well matched to this regulatory node—one characterized by a manageable number of sophisticated players who are already experienced with trading regimes, and where the transaction costs of implementing such a scheme will be relatively low. Although it is difficult to predict how such political struggles will ultimately play out (especially in the transportation sector), our point

¹⁵⁷ While it is not certain that a cap-and-trade system would be economy wide, there is ample precedent for regulating utilities. Not only are they heavily regulated already and experienced with sulfur trading, but some have continuous emissions monitoring systems that make compliance easier. Interview with former Dep't of Energy official, *supra* note 129; see also ROBERT REPETTO & JAMES HENDERSON, ENVIRONMENTAL EXPOSURES IN THE U.S. ELECTRIC UTILITY INDUSTRY 1 (2003) (“Most companies with generating assets are heavily exposed to the impacts of environmental regulations. Not only have utilities spent heavily to comply with past and current environmental standards, most are faced with the likelihood of significant additional expenditures to meet future environmental standards that are now being considered by Congress and regulatory agencies. Among the most significant of these are additional restrictions on emissions of nitrogen and sulfur oxides, airborne particulates, mercury and other toxic air pollutants, as well as new restrictions on emissions of carbon dioxide, the main greenhouse gas.”).

is simply that they have indirect effects: the political struggles determine the point of regulation, and this influences the choice of regulatory form.

D. *Empirical Evidence*

To review, we have argued that there are three factors relevant to the form of regulation: the end goals of the relevant interest groups, the “properties” of the environmental problem at issue, and the compatibility of particular regulatory instruments with the eligible nodes of regulation (taking into account not just technical fit, but also political conflict). Using GHG regulation as an example, we have claimed that knowing something about these factors helps us to explain the form of the federal regulatory response.

Specifically, our analysis thus far has suggested that we are likely to see a convergence of support for a cap-and-trade approach to climate regulation, at least in the electric utility sector (while the outcome in the transportation sector is less certain). We explained why, because of the nature of the climate problem, mainstream environmental groups would be more likely to support a cap-and-trade approach to climate regulation. We showed too why industry—always more predisposed to cost-minimizing instruments—should prefer cap-and-trade to taxes, primarily because of rents to be gained from grandfathering, permit allocation, and offsetting. And we showed how programs like the “voluntary” climate registries established first by the Department of Energy, and further refined by the states, create path dependence in favor of cap-and-trade programs by raising expectations that industry will receive credits for early voluntary reductions.

The empirical evidence supports our account. Virtually every prominent national environmental organization actively supports a federal cap-and-trade program for reducing GHG emissions.¹⁵⁸ Envi-

¹⁵⁸ Environmentalists are “united” around cap-and-trade “because they get more certainty under a cap—there is a clear number.” Interview with former Dep’t of Energy official, *supra* note 129. The groups either express support for cap-and-trade programs generally as a means to regulate climate change, or express support for a specific proposal that includes cap-and-trade, such as the McCain-Lieberman bill or the Kyoto Protocol. The NRDC supports the McCain-Lieberman Bill, except for a provision giving subsidies to nuclear energy companies, *see* Press Release, Natural Res. Def. Council, New Global Warming Bill Signals Momentum Growing for Effective Reductions (Jan. 12, 2007), *available at* <http://www.nrdc.org/media/2007/070112.asp>. The EDF supports cap-and-trade programs generally, *see* Envtl. Def. Fund, Cap and Trade 101 (Feb. 2005), *available at* <http://www.environmentaldefense.org/documents/>

ronmentalists appear to be supporting cap-and-trade approaches at the state level as well: not a single state initiative, even in states with the most powerful environmental lobbies, imposes a prescriptive emissions standard on utilities or other GHG emitters. Instead, the state initiatives impose caps, and allow sources (or collections of sources) to comply flexibly, through emissions trading or by securing offsets. This is especially striking when one considers that in the late 1980s, during debates over how to address acid rain, only one prominent environmental group supported emissions trading.¹⁵⁹

It may be tempting to attribute this shift in environmental support to “maturity” or pragmatism on the part of environmental groups. Perhaps environmentalists recognize that in the current political climate (with the Bush administration still in power and without a supermajority in the Senate), a market-based approach is likely the most viable regulatory option. Or perhaps the generally acknowledged success of the acid rain program has dispelled any lingering doubts about market instruments, so that once-dubious environmentalists

4348_CapAndTradeBasics.pdf, and specifically to reduce GHG emissions, *see* Envtl. Def. Fund, *How Congress Can Address Global Warming* (July 18, 2006), *available at* <http://www.environmentaldefense.org/article.cfm?contentID=5347>. Greenpeace supports the Kyoto Protocol, *see* Greenpeace U.S.A., *Climate Summit 2006*, <http://www.greenpeace.org/usa/campaigns/global-warming-and-energy/climate-summit-2006> (last visited May 1, 2007). The League of Conservation Voters supports the Kyoto Protocol, *see* League of Conservation Voters, *The Bush Administration Continues To Live in a Fantasyland as It Continues To Ignore the Fact that Global Warming Needs To Be Addressed*, <http://www.lcv.org/newsroom/press-releases/lcv-statement-on-kyoto-protocol-implementation.html> (last visited May 1, 2007). The Audubon Society expresses support for the cap-and-trade approach in an article in its magazine, *see* David Malakoff, *Global Warming*, AUDUBON, Dec. 2003, *available at* <http://magazine.audubon.org/features0312/opener.html>. The only major exception is the Sierra Club, whose position is somewhat unclear. It opposes “pollution trading,” except under strict rules, *see* Sierra Club, *Conservation Policies: Pollution Trading* (Feb. 20, 1999), <http://www.sierraclub.org/policy/conservation/trading.asp>. Nevertheless, the Sierra Club also believes that the United States should ratify the Kyoto Protocol, *see* Press Release, Carl Pope, Executive Dir., Sierra Club, *Bush Administration Fiddles as World Warms, While Russia Ratifies Kyoto Global Warming Treaty* (Sept. 30, 2004), *available at* <http://www.sierraclub.org/pressroom/releases/pr2004-09-30a.asp>.

¹⁵⁹ “Work on acid rain was heavily influenced by an emissions-trading proposal that had been circulated during 1988 by the” EDF. Joskow & Schmalensee, *supra* note 143, at 48; *see also* RICHARD E. COHEN, *WASHINGTON AT WORK: BACK ROOMS AND CLEAN AIR* 58-59 (1992) (describing EDF’s role in the consideration of the emissions trading program). As Keohane and his coauthors describe it, EDF had developed a market niche for itself as a moderate group interested in economically sensible approaches to environmental problems. The Bush administration had come into office committed to adopting a market approach to acid rain, and in this context, EDF exploited its market niche. Keohane et al., *supra* note 141, at 354.

have come around. All of these factors clearly played a role: undoubtedly environmental groups have grown both more savvy and pragmatic in the last twenty years,¹⁶⁰ and experience with market mechanisms has lessened ideological resistance to them.

Nevertheless, we do not think that “maturity” is the best explanation for environmentalist support of cap-and-trade in the climate context. Nor do we think that a cap-and-trade approach is inevitable because, as some believe, it is clearly a superior policy tool compared to prescriptive regulation.¹⁶¹ Indeed, most economists would agree that taxes are an efficient mechanism for forcing reductions of GHGs; yet, because they are so politically toxic, taxes are not likely to be the tool of choice. Instead, we think the better explanation of why environmental groups are more likely to support a cap-and-trade approach to GHGs is because cap-and-trade responds to their end goals in a particular context—a context in which solving the regulatory problem does not require attention to the spatial distribution of emissions reductions. This frees environmentalists from their traditional concern with reducing local exposures and focuses them on reducing aggregate emissions. As noted earlier, there may still be reasons why environmental groups will support other regulatory tools as well, even if, in theory, we might achieve greater aggregate reductions without them—either because of a concern with securing what we have called “collateral” benefits (e.g., reducing conventional pollution), or simply because of ideological commitments (e.g., to encouraging fewer and smaller cars). Still, the broad-based support we observe for cap-and-trade is striking.

At the same time, the empirical evidence shows strong and growing industry support for a federal cap-and-trade regime, primarily but not exclusively in the electricity sector. The earliest public support for emissions trading from corporate CEOs came from the Clean Energy Group, a coalition of electricity generation and distribution companies that included John Rowe of Exelon and Wayne Leonard of En-

¹⁶⁰ This has been necessary as environmentalists have had to confront waning bipartisan support for federal environmental legislation. See Richard J. Lazarus, *Congressional Descent: The Demise of Deliberative Democracy in Environmental Law*, 94 GEO. L.J. 619, 671, 674 (2006) (noting a decrease in the bipartisanship that was necessary for passing early environmental legislation).

¹⁶¹ Economists have long bemoaned the tendency of Congress to choose inferior policy tools in response to interest group pressure or distributional concerns. Keohane et al., *supra* note 141, at 320-21.

tergy.¹⁶² Archie Dunham, the chairman and former CEO of Conoco Phillips, was one of the members of the bipartisan National Commission on Energy Policy, and joined the Commission's unanimous consensus calling for a national cap-and-trade program.¹⁶³ Other corporate leaders voiced their support for cap-and-trade more recently in a conference held by the Senate Committee on Energy and Natural Resources in 2006.¹⁶⁴ By early 2007, major companies were publicly endorsing a cap-and-trade approach and moving on to matters of design and allocation.¹⁶⁵ The United States Climate Action Partnership, a coalition of ten prominent firms with operations across different sectors of the economy, including some of the biggest American energy and manufacturing firms, announced their support for a cap-and-trade program in a letter to President Bush before his sixth State of the Union address.¹⁶⁶ The support of these particular CEOs no doubt reflects calculations about their firms' economic self-interest—many are better positioned than their competitors to adapt to GHG regulation, and they may anticipate being “grandfathered” into an emissions trading system and receiving credits for reductions already made. Yet whatever their motivation, it is clear that of all the regulatory options available, including taxes, these industry leaders prefer a cap-and-

¹⁶² See E-mail from Ralph Cavanaugh, Senior Attorney and Co-Dir., Energy Program, Natural Res. Def. Council, to Jody Freeman (Apr. 20, 2007) (on file with authors).

¹⁶³ NAT'L COMM'N ON ENERGY POLICY, *supra* note 54, at ii, 19.

¹⁶⁴ See Video Recording: *Climate Conference: Before the S. Comm. on Energy & Natural Res.*, 109th Cong. (2006), available at http://www.weathervane.rff.org/solutions_and_actions/United_States/Federal_Approach/Domenici_Bingaman_Climate_Conference.cfm (communicating the support of various industry leaders for a national cap-and-trade program, including Jeff Sterba, President and CEO of PNM Resources in New Mexico, and Vice-Chair of the Edison Electric Institute (the national trade association of shareholder-owned electric companies)). Of course, these positions did not develop overnight; industry leaders had been honing their positions privately for some time.

¹⁶⁵ Now that the legislative process is moving, interest groups are fully engaged in questions of point of regulation, allocation of permits, grandfathering, and offsets. Interview with trade group lobbyist (anonymous by request) (Mar. 13, 2007) (notes on file with authors).

¹⁶⁶ See Jim Lobe, *Industry Hops on Climate Bandwagon*, INTER PRESS SERV. NEWS AGENCY, Jan. 22, 2007, available at <http://ipsnews.net/news.asp?idnews=36262>. The letter explicitly called for a “market-driven” approach and proposed legislation based in major part on a cap-and-trade system. *Id.*; see also Barringer, *supra* note 126 (describing the United States Climate Action Partnership as a coalition of major companies that proposed an aggressive goal of a 70%-90% reduction from current levels in fifteen years).

trade approach to the alternatives.¹⁶⁷ In sum, we see a convergence of support between environmentalist and industry groups for a cap-and-trade approach to climate change at the federal level.

This convergence is reflected, moreover, in the key climate proposals in Congress, most of which were introduced in the 109th Congress before control changed hands. All provide for a mandatory cap-and-trade program as their core feature for both the electricity and the transportation sectors, though we see more variability in proposals for the transportation sector.¹⁶⁸ Only subsidies and tax credits also appear a majority of the time, but these are consistent with a cap, and would make its imposition easier.

Table 1 below summarizes seven of the most important recent bills. Within the electricity sector, all of these bills direct the EPA to employ a tradable allowance program “downstream” at the level of retail energy utilities. Utilities would be required to hold permits that reflect the carbon emissions released as a result of producing each unit of energy sold to consumers. Given utilities’ earlier efforts to secure credits for early reductions in GHG emissions (through federal programs and state registries), it is not surprising to see agreement on a policy instrument that might afford them a favorable allocation of the regulatory burden.¹⁶⁹ Notably, none of the bills propose a mandatory emissions standard for electric power generators.¹⁷⁰

In the transportation sector, five out of seven bills propose a cap-and-trade system, yet the specificity with which it is proposed varies across the bills—it is not yet clear where in the supply chain the cap will be imposed. The Bingaman¹⁷¹ and McCain-Lieberman¹⁷² propos-

¹⁶⁷ This is not to say that support for cap-and-trade is unambivalent. Some trade groups worry that cap-and-trade might be too limited in its coverage (e.g., by covering the utility sector only) compared to a tax that could more easily include the transportation and residential sectors. Yet they concede that they might nevertheless prefer cap-and-trade, especially if they could get free permit allocations and credits for reductions already made, and if the offset policy is generous. Interview with industry trade association official (anonymous by request) (Mar. 9, 2007) (notes on file with authors).

¹⁶⁸ See *infra* Table 1.

¹⁶⁹ Indeed, some utilities have expressed a desire for a cap-and-trade system to be limited to their sector so that they could capture the “low-hanging fruit” of inexpensive offsets. Interview with former Dep’t of Energy official, *supra* note 129.

¹⁷⁰ In addition, three of the bills propose a renewable energy credit trading system, and the same number propose to establish RPSs. They also include a mechanism that reduces the costs of compliance with RPSs and, therefore, also helps reduce compliance costs in a tradable permit system. See *infra* Table 1.

¹⁷¹ Senator Bingaman’s proposal was not turned into legislation. For a summary, see Pew Ctr. on Global Climate Change, Summary of Bingaman Climate and Economy

als recognize that a market-based program can be most effectively implemented “upstream” at the level of the fuel refiners. These refiners would need permits equivalent to the GHG emissions associated with the consumption of fuel that they sell to distributors. However, other bills (e.g., Jeffords-Boxer,¹⁷³ Kerry-Snowe,¹⁷⁴ and Sanders-Boxer¹⁷⁵) focus on regulating the carbon content of fuels in what appears to be more of a command-and-control approach (although the exact implementation mechanism is not stated). None of the bills propose to increase fuel efficiency standards, although three propose direct standards for auto emissions. All of this signals that the interindustry struggle over the appropriate point of regulation remains unresolved in the transportation sector.¹⁷⁶ By way of further evidence, conflicts among the key players have erupted into public view.¹⁷⁷

Insurance Act of 2005, http://www.pewclimate.org/policy_center/analyses/bingaman_summary.cfm (last visited May 1, 2007).

¹⁷² Climate Stewardship and Innovation Act of 2007, S. 280, 110th Cong., sec. 3, § 5 (2007).

¹⁷³ Global Warming Pollution Reduction Act, S. 3698, 109th Cong., sec. 2, §§ 707–709 (2006).

¹⁷⁴ Global Warming Reduction Act of 2007, S. 485, 110th Cong. § 102 (2007).

¹⁷⁵ Global Warming Pollution Reduction Act, S. 309, 110th Cong., sec. 2, §§ 707–709 (2007).

¹⁷⁶ Notably, however, six out of the seven bills propose subsidies and tax credits to ease the regulatory burden.

¹⁷⁷ Until recently, conflicts between the oil companies and auto manufacturers were kept private because of a bargain: auto companies would not interfere with oil-related issues (such as the windfall profits tax or alternative fuels) and in exchange, the oil companies would not interfere with CAFE standards. Under the pressure of impending GHG regulation, this deal is breaking down. Interview with former Dep’t of Energy official, *supra* note 129. The Ford Motor Company (presumably representing the views of the auto industry generally) points to fuel producers as the appropriate node for GHG regulation:

Future policies need to encourage the use of lower-carbon fuels and energy (e.g., bio-ethanol fuels and blends) through favorable market signals and incentives, as well as encourage energy efficiency, carbon sequestration initiatives, offsets, and credits across all phases of the energy value chain. We believe that a properly structured, upstream system would allow all sectors of the economy to respond to the market signals and pursue the most cost-effective solutions to improve energy conservation and energy efficiency.

FORD MOTOR CO., FORD REPORT ON THE BUSINESS IMPACTS OF CLIMATE CHANGE 8 (2006), <http://www.ford.com/en/company/about/sustainability/default.htm> (follow “Ford Report on the Business of Climate Change” hyperlink).

At the same time, corporate leaders within the petroleum industry have indicated that regulation targeted at fuels is inappropriate. Red Cavaney, the CEO of the American Petroleum Institute, told the House Energy and Commerce Committee:

We also think that individual states should not force the use of ethanol by devising their own blend of gasoline/ethanol mandates. The last thing our na-

Thus, while adopting a fairly consistent approach to the electricity sector, most bills apply more heterogeneous approaches to the transportation sector. This can be explained in part by the fact that interest groups may have focused more on instruments for regulating the electricity sector and somewhat less on policy instruments they most prefer for the transportation sector. At the same time, the transportation sector has less experience than the electricity sector when it comes to monitoring its carbon emissions, and virtually no experience recording reductions in emissions via registries. It is, therefore, not surprising that we see less consensus on the appropriateness of any single policy instrument.

Finally, several of the pending bills would give entities credit for GHG emissions reductions already undertaken as part of a voluntary program. For example, the McCain-Lieberman proposal allows firms to receive credit for any demonstrable GHG emissions reductions since 1990;¹⁷⁸ the Sanders-Boxer bill proposes to grant the program administrator discretion to award credits for GHG reductions made prior to the initiation of a mandatory tradable permit program, providing they were made to comply with a state or local law, or have been made after 1992 and are “verifiable”;¹⁷⁹ and Senator Feinstein’s proposal includes a one-time allowance of credits for GHG reductions made between 2000 and 2010, provided that they have been reported to a state or federal registry.¹⁸⁰ These proposals further reinforce our path dependency story and help to explain strong industry support for cap-and-trade in particular.

tion needs now is an expansion of the boutique fuels patchwork of state-by-state laws by mandating ethanol use at different concentrations and/or under different terms.

Gasoline: Supply, Price and Specifications: Hearing Before the H. Comm. on Energy & Commerce (2006) (statement of Red Cavaney, President, American Petroleum Institute), available at 2006 WLNR 8186823.

¹⁷⁸ Climate Stewardship and Innovation Act of 2007, S. 280, 110th Cong. §§ 103, 165 (2007).

¹⁷⁹ Global Warming Pollution Reduction Act, S. 309, 110th Cong., sec. 2, § 704 (2007).

¹⁸⁰ Senator Feinstein’s 2007 proposal, the Electric Utility Cap and Trade Act of 2007, S. 317, 110th Cong., sec. 101, § 718 (2007), also establishes a national cap-and-trade system for the electricity sector to reduce its emissions by 25% below projected levels by 2020 and 1.5% annually thereafter. Senator Feinstein’s 2006 proposal, however, was not turned into legislation; for a summary of its provisions, see Press Release, Senator Dianne Feinstein, Senator Feinstein Outlines New Legislation To Curb Global Warming, Keep Economy Strong (Mar. 20, 2006), available at <http://www.feinstein.senate.gov/06releases/r-global-warm320.pdf>.

Table 1: Recently Proposed Federal Legislation
(indicates bills containing a form of each policy instrument)

	Bingaman 2005 ¹⁸¹	McCain-Lieberman 2005 ¹⁸²	Feinstein 2006 ¹⁸³	Jeffords-Boxer 2006 ¹⁸⁴	Kerry-Snowe 2006 ¹⁸⁵	Sanders-Boxer 2007 ¹⁸⁶	Feinstein 2007 ¹⁸⁷
Economy-Wide Cap Permit System	•	•		•	•	•	
Electricity Sector Approaches							
Allows for tradable permits	•	•	•	•	•	•	•
National RPSs				•	•	•	
Renewable energy credit trading				•	•	•	
Standards for existing power plants			•	• ¹⁸⁸		• ¹⁸⁹	
Standards for new power plants			•	•		•	• ¹⁹⁰
Transportation Sector Approaches							
Allows for tradable permits	•	•		•	•	•	
Low-carbon fuel requirements				•	• ¹⁹¹	•	
CAFE standards				•		•	
Direct standards for auto emissions				•	•	•	
Alternative Fuels (R&D/subsidies/tax credits)		•	•	•	•	•	•

¹⁸¹ See Pew Ctr. on Global Climate Change, *supra* note 171.

¹⁸² Climate Stewardship and Innovation Act of 2007, S. 280, 110th Cong. (2007).

¹⁸³ See Press Release, Senator Dianne Feinstein, *supra* note 180.

¹⁸⁴ Global Warming Pollution Reduction Act, S. 3698, 109th Cong. (2006).

¹⁸⁵ Global Warming Reduction Act of 2007, S. 485, 110th Cong. (2007).

¹⁸⁶ Global Warming Pollution Reduction Act, S. 309, 110th Cong. (2007).

¹⁸⁷ Electric Utility Cap and Trade Act of 2007, S. 317, 110th Cong. (2007).

¹⁸⁸ The Jeffords-Boxer 2006 bill, Global Warming Pollution Reduction Act, S. 3698, 109th Cong., sec. 2, §§ 708–709 (2006), and the Sanders-Boxer 2007 bill, Global Warming Pollution Reduction Act, S. 309, 110th Cong., sec. 2, §§ 708–709 (2007), impose GHG emissions standards for all power plants built after 2011, but also contain some requirements for existing power plants that generate more than 50% of their power by burning coal, petroleum coke, or lignite. Existing power plants that meet this condition will have to generate certain specified percentages of their future power from low-carbon sources (though they are also allowed to meet this requirement by buying credits from low-carbon electricity generators).

¹⁸⁹ See *supra* note 188.

¹⁹⁰ Senator Feinstein's bill only imposes requirements on new coal-fired power plants; it requires such plants to use "clean-coal technology" if they enter operation after January 1, 2007. See Electric Utility Cap and Trade Act of 2007, S. 317, 110th Cong., sec. 101, § 716(c) (2007).

¹⁹¹ The Kerry-Snowe proposal, Global Warming Reduction Act of 2007, S. 485, 110th Cong. § 102 (2007), does not require a certain percentage of cars to use low-carbon fuel, but it does require all major oil companies to install at least one E-85 pump at their gas stations, and it provides a number of tax incentives for manufacturers to produce and consumers to buy cars powered by E-85.

It is of course difficult to fully capture these events as they play out in real time. We have provided only an overview of a subset of the major proposals in Congress; there are many more, and their content will shift over time. Yet our overview is sufficient to show the consistency and prominence of cap-and-trade.

This form of regulation was not, however, preordained. The surprising convergence of support for it can be explained adequately only by closely examining the interaction of the three factors we identified—general interest group preferences, the properties of the regulatory problem, and the match between regulatory nodes and regulatory tools. Once elaborated, these factors may seem obvious, even mundane. And we cannot predict the precise content of the first federal climate law beyond our expectation that cap-and-trade will feature prominently in it. Yet our account offers a theoretical framework for recognizing and understanding the emergence of a form of regulation that otherwise seems arbitrary or *ad hoc*. The framework is primarily explanatory and not predictive. Nevertheless, it might help us to anticipate the form of federal environmental legislation in the future, especially if it addresses stock pollutants. The factors we identify might have explanatory power in other regulatory contexts as well.

CONCLUSION

In this Article, we used the example of climate change to explore two questions that we think are important for understanding federal regulation more generally: what effect does initial state regulatory activity have on the likelihood of federal regulation (the timing question), and what explains the nature of the ensuing federal policy response (the form question)? To answer the first question, we drew on race-to-the-bottom (RBT), interstate externality (ISE), and defensive preemption theories (DPT). We developed a more complete picture of how state regulatory entrepreneurialism can provoke interest groups on both sides of an issue to simultaneously demand federal regulation, though for different reasons. We emphasized, using the climate change example, that the assumptions of RBT and ISE do not apply because every state is at the bottom and there are no localized effects of interstate GHGs. Yet we explained that environmentalists and state and local governments respectively have other reasons to appeal for federal standards: to help solve a collective action problem, spread the cost of GHG regulation, and benefit in-state industries, among other things. And we showed that the insights from DPT do bear out in this context—state regulation has driven industry to

appeal for federal standards. Thus, we showed how the states have hit the “regulatory sweet spot” with their climate change initiatives. By unnerving industry while leaving environmentalists unsatisfied, they have created the perfect conditions under which both pro-regulatory and anti-regulatory constituencies will simultaneously appeal to the federal government for relief. This illustrates how states can be incremental catalysts of a federal policy response, increasing the likelihood that Congress will act sooner rather than later.

It is important to stress what we are not claiming. On the matter of timing, we do not claim to offer a complete causal account of why Congress seems poised to regulate GHGs. Indeed, many factors that are not part of our analysis help to explain this development: a stronger and more boldly stated scientific consensus on climate change;¹⁹² catastrophic events such as Hurricane Katrina, the intensity of which can be linked to rising ocean temperatures;¹⁹³ the proposed listing of the polar bear as “threatened” under the Endangered Species Act due to melting sea ice,¹⁹⁴ which established a poster species for global warming; the Supreme Court’s decision rejecting the EPA’s reasons for declining to regulate GHGs under the Clean Air Act;¹⁹⁵ and even movies like *An Inconvenient Truth*,¹⁹⁶ which helped to educate the public. All of these events have contributed to the rising voter demand for a federal response to climate change.

Nevertheless, we believe that states play an important role. By prompting both industry and environmental groups to seek a federal response, states have effectively sped up and intensified the demand for federal climate regulation. The states matter here not because they shame the federal government, nor because they model possible regulatory responses—although they may do that as well. They matter

¹⁹² See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, WORKING GROUP I, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 5, 10 (2007), available at http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_SPM.pdf (concluding that global warming is “unequivocal” and that human activity is “very likely” the main cause of most of the rise in temperature since 1950). For an analysis of the Report’s initial political impact, see Elisabeth Rosenthal & Andrew C. Revkin, *Science Panel Says Global Warming Is ‘Unequivocal’*, N.Y. TIMES, Feb. 3, 2007, at A1.

¹⁹³ See M.E. Mann & K.A. Emanuel, *Atlantic Hurricane Trends Linked to Climate Change*, 87 EOS 233, 233 (2006).

¹⁹⁴ Press Release, U.S. Dep’t of the Interior, Interior Secretary Kempthorne Announces Proposal To List Polar Bears as Threatened Under Endangered Species Act (Dec. 27, 2006), available at <http://www.fws.gov/home/feature/2006/12-27-06polarbearnews.pdf>.

¹⁹⁵ *Massachusetts v. EPA*, 127 S. Ct. 1438, 1455, 1462, 1463 (2007).

¹⁹⁶ AN INCONVENIENT TRUTH (Paramount Pictures 2006).

because they make all the key players unhappy enough to appeal to Congress for relief.

Yet none of this bears on the second question about the determinants of regulatory form. Once the federal government chooses to act, Congress has a number of ways to satisfy these general demands. What determines the choice of one regulatory approach over another? Perhaps the answer seems obvious. Some regulatory tools are self-evidently superior, one might say. On this theory, a cap-and-trade approach to climate regulation, widely viewed as more cost effective than prescriptive standards, can seem inevitable. Yet just because a regulatory tool will arguably be the most effective does not explain why Congress adopts it. Indeed, the regulatory landscape is littered with “superior” policy instruments cast aside by legislators for one reason or another. And policy choices that seem obvious in retrospect are rarely so obvious before they were chosen.

There is no reason to believe that a cap-and-trade approach to climate change is preordained. The options before Congress range from performance standards to design standards to emissions trading to taxes. The first determinant of regulatory form is, of course, interest group preferences. Congress responds as much (if not more) to interest group politics as it does to policy arguments about the theoretical superiority of one approach or another when it chooses among different regulatory tools.¹⁹⁷ So to predict form, we must know something about the end goals of the dominant interest groups. Interest groups of course will generally prefer regulatory approaches that accomplish their goals over ones that do not—for example, industry will tend to favor instruments that keep compliance costs down. And as other scholars have pointed out, once federal regulation is inevitable, the rent seeking begins: regulated industries will lobby fiercely to minimize their costs and gain advantage over their competitors while substitute products industries will fight for financial transfers.¹⁹⁸

Yet such theories do not explain more specifically why different interest groups with different general preferences might converge in a particular context on a specific regulatory tool. For this, we need a more fine-grained and contextual analysis. Using the climate change

¹⁹⁷ See ACKERMAN & HASSLER, *supra* note 1, at 54-55.

¹⁹⁸ Wiener has described this process in terms of “public-spirited” movements (“Baptists”) that create the impetus for environmental laws, and then self-interested rent seekers (“bootleggers”) who shape many of the technical details of those laws. Wiener, *supra* note 14, at 755-56, 760.

case study, we identified two additional factors that influence the choice of regulatory instrument, beyond the general aims of the dominant interest groups. These are the particular properties of the regulatory problem and the compatibility of the available regulatory tools with the eligible targets of regulation.

We showed how the unique nature of climate change—namely, the fact that it involves stock pollutants—frees environmentalists from concerns about local effects and enables them to support a cap-and-trade approach. We showed too how cap-and-trade, uniquely, provides opportunities for rent seeking in the form of grandfathering, allocation, credits, and offsets. We explained how the early “voluntary” emissions reductions programs raised expectations among both environmentalists (who support such registries) and participating firms that firms will later receive credits for cuts made prior to the implementation of a mandatory regime. We argued that, in this way, state programs created some path dependence for cap-and-trade, the only form of regulation capable of “grandfathering” historical emissions and crediting voluntary cuts.

Finally, we explained how some regulatory tools are more compatible than others with different nodes of regulation in the supply chain. Thus, we showed how the outcome of political struggles over where to place the burden of regulation (i.e., upstream or downstream) has an impact on what tools will be chosen. Because these political struggles have yet to fully play out in both the electric power and the transportation sectors, we cannot be sure about the precise composition of the first federal climate law. But we are fairly confident that a cap-and-trade approach with a grandfathering component will be a dominant feature. Although this may seem on its face like a sensible solution, our story explains how it comes about.

Our analysis should be instructive to those interested in better understanding the genesis and nature of federal environmental regulation. It sheds light on the important role states can play in catalyzing a federal response after a period of dormancy, and it identifies at least three key factors that help to explain the ultimate content of federal policy. We have not offered a comprehensive or perfectly predictive theory, and the ultimate reach of the analysis offered here will turn somewhat on whether the type of challenge presented by climate change is unique or a sign of regulatory problems to come. At a minimum, however, with this first step, we hope to ignite a larger and more sustained inquiry into the timing and form of federal regulation.