

Clean Air Act Dynamism and Disappointments: Lessons for Climate Legislation to Prompt Innovation and Discourage Inertia

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INTRODUCTION

All successful regulatory schemes must balance clarity and stability with the need for flexibility and regulatory learning. Room for regulatory and private sector innovation is critical. However, regulatory challenges often encounter not restless regulators and private actors brimming over with innovation ideas and seeking regulatory improvements, but government and private sector inertia and resistance to change.¹ Both regulators and the targets of regulation may invest in initial regulatory choices and, regardless of the efficacy of such choices, resist investment in change due to limited resources, waste of sunk costs, fear of uncertain results, status quo bias, or laziness. Antiquated and often more lax requirements imposed on established polluters can provide an economic advantage to existing polluters and serve as a barrier to entry by new competitors. Even entities such as public interest nonprofits, despite their ostensible watchdog roles, may fail to reexamine old regulatory

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1. For discussion of the inertia risks and related motivations summarized in this paragraph, see discussion *infra* Part I.

choices, due to limited resources or a focus on newer challenges in the public limelight.

The Clean Air Act (“CAA”) is a behemoth of a law, with hundreds of pages and numerous titles reflecting decades of amendments.² The law, through its many complex and interacting provisions, seeks to address the myriad sources of air pollution with a concomitant complex array of potential regulators and responsive regulatory strategies. Versions of the CAA preceding the substantial 1990 amendments were criticized by some as unduly rigid command and control regulations.³ Some of those criticisms undoubtedly were accurate, but key provisions of the CAA actually offer diverse and arguably laudable strategies that balance desire for stability and knowable legal obligations with the need for innovation, change, and antidotes to regulatory inertia. Effective, innovative provisions, as well as those proven to be flawed, provide lessons for other environmental legislation, especially climate change legislation.

It appears likely that any federal climate change legislation will utilize a cap-and-trade scheme.⁴ A cap-and-trade scheme limits aggregate emissions of greenhouse gases (“GHGs”) on an annual declining basis, distributes emission allowances, and permits trading of emission allowances and offset credits.⁵ Such a market-based

2. 42 U.S.C. §§ 7401–7700 (2006).

3. The most sustained and focused criticism of the law appeared in several 1980s works by Bruce Ackerman, William Hassler, and Richard Stewart. See BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR, OR HOW THE CLEAN AIR ACT BECAME A MULTIBILLION-DOLLAR BAIL-OUT FOR HIGH-SULFUR COAL PRODUCERS AND WHAT SHOULD BE DONE ABOUT IT 11 (1981) (claiming that the CAA forced the EPA to specify both the ends and means of achieving clean air objectives in new power plants); Bruce A. Ackerman & William T. Hassler, *Beyond the New Deal: Coal and the Clean Air Act*, 89 YALE L.J. 1466, 1477–78 (1980) (suggesting that because only the “best system” is acceptable in new plants, the new plants must initiate one specific “best system” rather than considering local conditions); Bruce A. Ackerman & Richard B. Stewart, Comment, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1341 (1985) [hereinafter Ackerman & Stewart, *Reforming Environmental Law*] (claiming that a best available technology standard “command[s] specific amounts of cleanup from specific polluters”). Their criticisms provoked responsive critiques of the feasibility of their analysis and prescriptions. See, e.g., Howard Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and ‘Fine-Tuning’ Regulatory Reforms*, 37 STAN. L. REV. 1267, 1268–71 (1985) [hereinafter Latin, *Ideal Versus Real Regulatory Efficiency*] (explaining the advantages of uniform standards over more flexible regulatory strategies).

4. See *infra* Part III.

5. See U.S. EPA Cap and Trade, Cap and Trade Markets, <http://www.epa.gov/captrade/>

regime likely would be coupled with numerous mandates and incentives structured to produce a lower polluting and more energy-efficient economy. Such a bill would offer some promise of innovation and checking of inertial forces, but if the bill lacks key strategies or utilizes strategies similar to those that have proven to be ineffective, it may lose key pro-innovation and inertia-fighting factors. Most notably, ambivalence toward state roles and technology-forcing provisions may result in climate legislation that omits strategies and structures that have proven effective in the CAA.⁶ This Article reviews these key strategies offering CAA dynamism and reflects on the lessons these strategies provide for climate change legislation.

I. THE RATIONALES FOR BALANCING LEGAL STABILITY WITH LATITUDE FOR CHANGE AND DESTABILIZATION MECHANISMS TO CHECK INERTIA

If an environmental law—or any law—is perpetually in flux, it likely will frustrate both private and public goals. Legal stability and knowable legal obligations are essential.⁷ However, regulation could also create the opposite problem, where legal strategies and resulting obligations are set and then seldom revisited, even if innovations and improved results are possible. Before turning to CAA provisions that seek to balance these goals and concerns, this Part discusses the stability-innovation tradeoff.

From the perspective of those regulated, a stable regulatory environment is critical for investment decisions and market success. An industrial polluter, homebuilder, or virtually any target of regulation, will find it difficult to succeed if it confronts an unduly confusing body of regulation or regulatory obligations that are in constant flux.⁸ With too many changes or confusing law,⁹ it will take

allowance-trading.html (last visited Apr. 10, 2010).

6. See *infra* Part III.B.

7. See, e.g., LON L. FULLER, *THE MORALITY OF LAW* 38–39 (rev. ed. 1969).

8. See Richard J. Lazarus, *Meeting the Demands of Integration in the Evolution of Environmental Law: Reforming Environmental Criminal Law*, 83 *GEO. L.J.* 2407, 2429–40 (1995) (noting the complex and confusing nature of environmental regulation); J.B. Ruhl & James Salzman, *Mozart and the Red Queen: The Problem of Regulatory Accretion in the*

large investments in regulatory compliance and related research to operate, effectively drawing limited resources from productivity-enhancing investments.¹⁰ Some regulatory changes may prompt investments that improve both productivity and reduce pollution or other environmental harms, but the costs of determining compliance obligations generally will be transaction costs that do not further economic or environmental goals.¹¹ If another jurisdiction offers a more stable and knowable regulatory environment, competitors operating in that other jurisdiction will have a competitive advantage with respect to that variable.¹²

On the other hand, rigidified laws, regulations, and permit obligations can lead to poor environmental performance and economic harms, even if a particular polluter may benefit from such obligations. Rigid regulation can harm industry by precluding polluters from finding cost-effective means to attain regulatory ends while meeting business goals.¹³ But few laws dictate more than levels of performance; technological mandates are rare and disfavored.¹⁴ Much regulatory inertia flows from agencies that fail to meet implementation deadlines, fail to find better means to regulatory

Administrative State, 91 GEO. L.J. 757, 761 n.12 (2003) (describing the excessive amount of environmental regulation as “regulatory accretion”).

9. See Lazarus, *supra* note 8; Ruhl & Salzman, *supra* note 8.

10. See Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239, 266 n.65 (1984).

11. Although lawyers and consultants may applaud and recognize so-called transaction costs that support their livelihood and may productively enhance regulatory and transactional outcomes, much of their work is not likely to enhance productivity. See *id.* at 241–42, 250–55 (suggesting that lawyers often do not serve in constructive or productive roles but arguing that lawyers can act to address information failures and move a deal to a more appropriate price).

12. Cf. Robert B. Ahdieh, *Trapped in a Metaphor: The Limited Implications of Federalism for Corporate Governance*, 77 GEO. WASH. L. REV. 255, 284 (2009) (“[S]tates that enact indeterminate rules or fail to innovate efficiently can be expected to suffer a loss in incorporations. . . . States that align their rules with the needs of relevant corporations, and their franchise taxes with the value of services they provide, by contrast, can be expected to gain business.”); Jerry Ellig & Houman B. Shadab, *Talking the Talk, or Walking the Walk? Outcome-based Regulation of Transnational Investment*, 41 N.Y.U. J. INT’L L. & POL. 265, 324–29 (2009) (noting that countries with strong legal systems attract more investors).

13. See Lynn E. Blais & Wendy E. Wagner, *Emerging Science, Adaptive Regulation, and the Problem of Rulemaking Ruts*, 86 TEX. L. REV. 1701, 1714 (2008).

14. See, e.g., 42 U.S.C. § 7411(h) (2006).

ends, or do not take enforcement action against noncompliance.¹⁵ Some of this inertia is due to overly optimistic and aspirational laws that are not accompanied by adequate monetary resources or realistic deadlines and regulatory burdens.¹⁶ Agencies may also be dilatory and fail to meet requirements due to bureaucratic laziness. Many agencies seek budgetary expansions and possibly an enlarged regulatory turf, but those sometimes observed tendencies do not necessarily lead to self-critical and active regulators.¹⁷ For reasons amplified below, agencies will sometimes fear cracking down on regulatory targets, alienating executive officials or legislators controlling their budgets, or upsetting established modes of action.

Targets of regulation often are happy with such inertia and resist change, especially change that might result in more stringent regulatory requirements.¹⁸ In ways that may be harmful to both business and environmental goals, targets may avoid information that might trigger more stringent regulatory controls. Industry will seek to influence regulators and legislators, sometimes capturing ostensible regulatory agencies and thereby creating an unduly lax agency sympathetic to those regulated.¹⁹ Even if agencies are not literally captured, they are dependent on industry for information and will frequently interact with their ostensible targets.²⁰ This may result in decisions that inordinately reflect industry preferences. Countervailing citizen groups or nonprofits sometimes counter industry views and preferences, but often are outmatched.

15. See, e.g., John P. Dwyer, *The Pathology of Symbolic Legislation*, 17 *ECOLOGY L.Q.* 233, 277–83 (1990) (discussing how Congress declares goals without commensurate funding and adequate enforcement mechanisms, leading to implementation failures such as EPA’s delay in regulating hazardous air pollutants).

16. See *id.* at 283.

17. See William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 *IOWA L. REV.* 1, 40–41, 44–48 (2003) [hereinafter Buzbee, *Recognizing the Regulatory Commons*] (noting the hypothesis that regulators seek budgeting and turf expansions for personal gain but developing the regulatory commons hypothesis to explain why inaction and risk aversion may be found).

18. See *id.* at 34–36.

19. Richard B. Stewart, *The Reformation of American Administrative Law*, 88 *HARV. L. REV.* 1669, 1684–87 (1975); Cass R. Sunstein, *Constitutionalism after the New Deal*, 101 *HARV. L. REV.* 421, 448–49 (1987) (discussing the phenomenon of “capture”).

20. See Douglas A. Kysar & James Salzman, *Making Sense of Information for Environmental Protection*, 86 *TEX. L. REV.* 1347, 1352 (2008).

Asymmetrically borne benefits and risks will virtually ensure industry engagement, but citizen beneficiaries of regulatory protection may not act.²¹ Citizens typically lack the monetary resources of industry participants and bear a small percentage of resulting harm of unregulated activity or benefits of regulatory action.²² These asymmetrically borne interests skew monetary incentives against citizen participation in the regulatory process, resulting in greater relative influence of stakeholders in industry or government. As economist Mancur Olson observed, this disparity in resources, coupled with the concentrated interest of small numbers of regulatory targets, systematically advantages industry or the government and disadvantages beneficiaries of regulation.²³

Regulatory regimes that have become encrusted with complexities and quirks, especially provisions tailored to production modes of dominant but possibly antiquated industry practices, provide advantages to existing industry participants and discourage new market entrants.²⁴ New entrants must master legal intricacies and might have to tailor their production methods in inefficient ways to meet the law in settings where regulation assumes older modes of production. Even where regulatory obligations may be simple to discern, many bodies of regulation grandfather in existing sources of harm.²⁵ Grandfathering subjects existing sources to more lax requirements than those faced by new pollution sources and often grants them an economic advantage, such as by giving existing

21. Bradley C. Karkkainen, *Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation*, 86 TEX. L. REV. 1409, 1413–20 (2008) [hereinafter Karkkainen, *Bottlenecks and Baselines*] (discussing information asymmetries among industry, agencies, and citizen stakeholders and reasons this leads to skewed or imprudent regulation).

22. *Cf. id.* at 1415.

23. See MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION* 143–45 (1965).

24. For a discussion of barriers to entry, see Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 572 (2001) (citing Nathaniel O. Keohane, Richard L. Revesz & Robert N. Stavins, *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313, 348–51 (1988)).

25. See Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 NW. U. L. REV. 1677, 1678 (2007) (exploring rationales for and against grandfathering strategies); see also Jonathan Masur & Jonathan R. Nash, *The Institutional Dynamics of Transition Relief*, 85 N.Y.U. L. REV. (forthcoming 2010) (discussing grandfathering and other forms of transition relief and developing political and economic explanations for the prevalence of such relief).

sources freely distributed pollution allowances.²⁶ In contrast, new market entrants must purchase allowances in the market.²⁷ Such strategies reward sources of past harm and pollution and create incentives for such sources not to adjust to legal and political change.²⁸ Older, accreted, and complex bodies of law thus can serve as barriers to new entrants. These barriers, in turn, protect old, inefficient, and often high-pollution production methods and deny consumers the benefit of greater market competition.

Policymakers also often have an incentive to maintain the status quo, which in turn is influenced by regulatory stakeholders' preferences. This status quo bias is rooted in several related psychological tendencies and political-economic incentives that impede change.²⁹ A general tendency of people to value what they have and resist change is a robust tenet of behavioral economics.³⁰ Furthermore, politicians and regulators who invest in a regulatory framework will resist throwing away related investments. Complying industry will be especially resistant to change requiring yet more investments in modified production methods to meet new requirements. Hence, even a regulatory approach viewed by lawmakers and industry as misguided may be preferred to an improved standard due to general resistance to change and associated costs.

A further phenomenon creates a heightened risk of rigidified legal obligations. Agencies operating in the environmental arena tend to address risks and resulting harms that involve scientific and technological uncertainties and regulatory strategies of untested efficacy. Moreover, agency regulatory choices often prove

26. See Nash & Revesz, *supra* note 25, at 1708.

27. 42 U.S.C. § 7651d(b)–(e).

28. See, e.g., Louis Kaplow, *An Economic Analysis of Legal Transitions*, 99 HARV. L. REV. 509, 584–86 (1986).

29. See William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547, 1594–95 (2007) [hereinafter Buzbee, *Asymmetrical Regulation*]; William W. Buzbee, *Interaction's Promise: Preemption Policy Shifts, Risk Regulation, and Experimentalism Lessons*, 57 EMORY L.J. 145, 156 & n.39, 160–61 (2007) [hereinafter Buzbee, *Interaction's Promise*]; Richard J. Lazarus, *Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future*, 94 CORNELL L. REV. 1153, 1179–80, 1185–96; Jeffrey J. Rachlinski, *The Psychology of Global Climate Change*, 2000 U. ILL. L. REV. 299, 300 (2000).

30. See Rachlinski, *supra* note 29, at 307–08.

disappointing to both targets and beneficiaries of regulation. Therefore, most major regulatory actions, especially rulemakings, are followed by judicial challenges. Due to often intrusive “hard look review” of agency action, scholars have long observed a problem of regulatory “ossification” as agencies shy away from the costs, delays, and expenditures associated with regulatory litigation.³¹ Judicially induced ossification is compounded by increasingly burdensome analytical requirements in executive orders or statutes mandating that agencies examine at least cost-benefit implications, effects on small business, paperwork burdens, and federalism impacts.³² Unsurprisingly, many regulatory deadlines for an agency to update its performance standards and other environmental requirements go unmet. A missed deadline can trigger litigation from regulatory beneficiaries or vendors of services or goods that would benefit from updated regulation.³³ Thus, avoidance of an increased workload, coupled with old-fashioned risk aversion, will lead regulators to resist regulatory reexamination and change.³⁴

Many environmental laws also require polluters’ permits to be updated at regular intervals, usually with a prohibition on “backsliding”; renewed permits usually cannot be more lax than an earlier permit.³⁵ Permitting proceedings can be time-consuming and costly for regulators and the polluting industry, and are similarly costly for any participating citizens.³⁶ When an opposing citizen

31. For perhaps the most prominent article regarding the ossification hypothesis, see Thomas O. McGarity, *Some Thoughts on “Deossifying” the Rulemaking Process*, 41 DUKE L.J. 1385, 1419–20 (1992). See also Blais & Wagner, *supra* note 13, at 1704–29 (discussing regulation ossification and related scholarship).

32. For a summary of these analytical requirements imposed by laws and executive orders, see ROBERT L. GLICKSMAN ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 210–17 (5th ed. 2007).

33. See, e.g., *Hazardous Waste Treatment Council v. EPA*, 861 F.2d 277 (D.C. Cir. 1988) (describing case in which manufacturers of waste treatment equipment sued the EPA for not implementing stringent regulation).

34. See Buzbee, *Asymmetrical Regulation*, *supra* note 29, at 1592–95, 1608–09 (discussing risk aversion and its implications for regulatory resistance to change in an article exploring implications of preemption choices).

35. Cf. Blais & Wagner, *supra* note 13, at 1717–19 (discussing the revised requirements of the Clean Water Act (“CWA”) and CAA).

36. Graham Zorn, *Prevention of Significant Deterioration and Its Routine Maintenance Exception: The Definition of Routine, Past, Present, and Future*, 33 VT. L. REV. 783, 797–98 (2009).

group participates in permit proceedings, any resulting permit change can trigger subsequent litigation. The resulting time and monetary expenses can dissuade permittees and regulators from updating permits.³⁷ In settings where no beneficiary group is monitoring a polluter's permit compliance or permit renewal obligations, old permits may remain in effect long after they should be revised; neither the government nor the polluter will seek change.

The use of cooperative federalism's "delegated program" structures can provide numerous regulatory benefits. However, such structures can also contribute to permit laxity and failures to update permit obligations. Many states assume initial responsibility for implementation and enforcement of federal law, subject to varying degrees of federal oversight and overfiling risks.³⁸ States sometimes innovate and regulate with greater rigor than the federal government.³⁹ More often, however, the opposite is true. State and local governments are more dependent on local employment and tax revenues than federal actors, resulting in a frequent bias in favor of industry and against regulatory rigor.⁴⁰ States often will miss

37. See Blais & Wagner, *supra* note 13, at 1720–28 (noting the EPA's failure to revise standards to reflect technological innovation and diffusion); Oliver A. Houck, *Ending the War: A Strategy to Save America's Coastal Zone*, 47 MD. L. REV. 358, 390 (1988) (discussing the EPA's failure to review permits as required by the CWA).

38. See GLICKSMAN ET AL., *supra* note 32, at 991–1001 (discussing and providing materials regarding overfiling).

39. See, e.g., William W. Buzbee, *Contextual Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 108, 119–21, 123 (2005) [hereinafter Buzbee, *Contextual Environmental Federalism*] (exploring settings in which states and the federal government have advanced regulatory protections and how each have learned from the other's innovations); Kirsten 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?*, 38 URB. LAW. 1015, 1021–25 (2006) [hereinafter Engel, *State and Local Climate Change Initiatives*]; Revesz, *Federalism and Environmental Regulation*, *supra* note 24, at 640 (analyzing dynamics of environmental regulation and finding more evidence of state leadership and innovation than typically found by other legal scholars); Richard B. Stewart, *States and Cities as Actors in Global Climate Regulation: Unitary vs. Plural Architectures*, 50 ARIZ. L. REV. 681, 683–88 (2008) [hereinafter Stewart, *States and Cities as Actors in Global Climate Regulation*].

40. See Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is It "to the Bottom"?* 48 HASTINGS L.J. 271, 274–78 (1997); Victor B. Flatt, *A Dirty River Runs through It (the Failure of Enforcement in the Clean Water Act)*, 25 B.C. ENVTL. AFF. L. REV. 1, 1–6 (1997) (discussing the "race to the bottom" phenomenon). *But see* 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) (arguing that

statutory deadlines and delegated program obligations. They often show enforcement laxity, offering minimal or nonexistent penalties for regulatory violations.⁴¹ In addition, states sometimes will cooperate with industry to take lax enforcement actions in an effort to subvert federal or citizen enforcement actions against a polluter violating the law. Whether through collusive secret administrative consent orders or minimal state penalties accompanied by interim relief from permit limitations, state and local actors can require environmental performance far below federal requirements.⁴² Here, too, the results are static environmental requirements and little or no environmental improvement.

Most statutorily required permit limitations are not literally “command and control” in the sense of mandating a technology. Instead, most statutes, regulations, and permits examine technological capacity and countervailing costs or feasibility factors, then utilize performance standards that set a numerical pollution limit.⁴³ Such regulatory and permit limitations initially push in the direction of more stringent pollution requirements, but they also create an inertia risk. Under outdated, technology-based performance standards, polluters have little or no incentive to improve their performance beyond what those standards require.⁴⁴ Additional pollution-reduction investments merely create costs without providing regulatory or market reward unless the polluter can claim credit for being “green” or achieving more sustainable operations. Others may find

state competition can lead to an “efficient allocation of industrial activity”). For a comprehensive investigative journalistic assessment of enforcement failures under the CWA, with a substantial focus on state-level laxity that often is unchecked by the federal government, see Charles Duhigg, *Clean Water Laws Are Neglected, at a Cost in Suffering*, N.Y. TIMES, Sept. 13, 2009, at A1.

41. See Duhigg, *supra* note 40; Flatt, *supra* note 40, at 5.

42. See, e.g., William W. Buzbee, *The Story of Laidlaw: Standing and Citizen Enforcement*, in ENVIRONMENTAL LAW STORIES 201, 210–11 (Richard J. Lazarus & Oliver A. Houck eds., 2005) [hereinafter Buzbee, *Story of Laidlaw*].

43. See Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 27–32 (2001); see also *Entergy Corp. v. Riverkeeper Inc.*, 129 S. Ct. 1498, 1505–10 (2009) (discussing best available technology standards under CWA and cost-benefit analysis used by EPA, concluding that the EPA’s reliance on cost-benefit analysis was permissible).

44. See Ackerman & Stewart, *Reforming Environmental Law*, *supra* note 3, at 1336 (noting that best available technology performance standards do not “provide strong incentives for the development of new, environmentally superior strategies, and may actually discourage their development”).

compliance costly and difficult, reducing profits or forcing a business closure. Thus, even appropriately up-to-date regulatory and permit standards do not create incentives for anyone to do better. Other than with regard to their own permit compliance, there will be limited reward for investment in research to discover more effective environmental regulation or pollution control technologies. Lack of reward for innovation is especially likely if companies are partially insulated from competition by regulatory frameworks or other deviations from an ideal, competitive market.

Tradable permits can serve as a valuable antidote to complacency resulting from command-and-control or performance-based standards. Tradable permits also reward innovation, a realization that spurred enactment of several CAA titles utilizing variants on pollution trading. In fact, the CAA contains numerous provisions that serve as antidotes to laxity and inertia, while still offering polluters ascertainable legal obligations and nudging them in the direction of cleaner air. The next Part analyzes those provisions, contrasting effective provisions with several that have proven dysfunctional.

II. CLEAN AIR ACT INNOVATION AND INERTIA LESSONS

Despite occasional condemnation of the CAA as a law mostly based on unduly rigid command-and-control regulation,⁴⁵ the Act actually contains numerous provisions that create powerful incentives and structures that reduce inertia risks and can prompt innovation resulting in environmental improvements. Other provisions, in contrast, are recipes for dysfunction and outdated regulatory requirements.

A. Federalism Structures

A large structural feature of the CAA that encourages innovation and regulatory learning is use of cooperative federalism “delegated program” structures.⁴⁶ These delegated program structures allow

45. See sources cited *supra* note 3.

46. William W. Buzbee, *Federal Floors, Ceilings, and the Benefits of Federalism's Institutional Diversity*, in *PREEMPTION CHOICE: THE THEORY, LAW, AND REALITY OF*

states to take over federal implementation and enforcement roles.⁴⁷ The delegation is not complete; federal oversight precedes most delegations and remains post-delegation in the form of oversight of implementation and enforcement.⁴⁸ Such delegations allow a degree of local tailoring of air pollution goals and means by which to comply, thereby providing potential lessons for other states and federal regulators.⁴⁹ Relatedly, the United States Environmental Protection Agency (“EPA”) is obligated to keep a clearinghouse of information regarding pollution risks, goals, and reduction strategies.⁵⁰ That clearinghouse is supported by retention of a multiplicity of actors as players in the CAA implementation and enforcement process.⁵¹

Perhaps more important to latitude and incentives for innovation are the CAA’s savings clauses and floor preemption strategies.⁵² These linked strategies preserve state and local governments’ option to impose more stringent pollution reduction obligations, thus allowing for additional diversity of regulatory approaches. Floor preemption strategies preclude state regulation that is more lax than the federal norm but allow more protective state and local measures. Such regulatory floors and savings clauses thus allow state and local governments to enact legislation or regulations that force polluters to reduce pollution more than federal standards require.⁵³ Many states

FEDERALISM’S CORE QUESTION 98, 101 & n.6 (William W. Buzbee ed., 2009) [hereinafter PREEMPTION CHOICE].

47. *See id.* at 101.

48. William W. Buzbee, *The Menu of Preemption Choice Variables*, in PREEMPTION CHOICE, *supra* note 46, at 301.

49. *See* David E. Adelman & Kirsten H. Engel, *Adaptive Environmental Federalism*, in PREEMPTION CHOICE, *supra* note 46, at 277, 293–95 (discussing the merits of overlapping federal and state jurisdiction in environmental legislation).

50. *See, e.g.*, 42 U.S.C. §§ 7403, 7408(h) (2006).

51. As discussed below and evident throughout the CAA, EPA, states, industry, citizens, and other interested entities are provided innumerable opportunities to participate in the implementation and enforcement process. *See infra* notes 52–70 and accompanying text.

52. In addition to numerous provisions providing states with authority and opportunities to influence the implementation of CAA goals, the CAA contains a sweeping savings clause that preserves states’ ability to be more protective. *See* 42 U.S.C. § 7416. Opening provisions specifically note past and current state roles. *Id.* §§ 7401–7402.

53. Buzbee, *Asymmetrical Regulation*, *supra* note 29, at 1567–68; Buzbee, *Interaction’s Promise*, *supra* note 29, at 157, 162; Buzbee, *Federal Floors, Ceilings, and the Benefits of Federalism’s Institutional Diversity*, in PREEMPTION CHOICE, *supra* note 46, at 98, 106–10.

have no interest in going beyond federal levels of protection and have enacted laws precluding such action.⁵⁴ Other states, especially California, have in various areas of the law imposed more stringent standards than federal laws require.⁵⁵ Sometimes these innovations appear to spring from the creativity and culture or needs and opportunities of the particular state. In other instances, they arise in the context of state improvements to federal regulatory schemes.⁵⁶ Each such innovation and more protective law or regulation serves to educate federal regulators, regulators in other states and municipalities, and citizens about creative regulation and achievable environmental results.⁵⁷ A benefit of federalism and latitude for state innovation and greater stringency is that even if most states move in lockstep and are inclined to laxity, one state innovator can offer lessons to all. Other jurisdictions may learn from innovative states' successes and failures since governmental innovations will, by their nature, be publicly known initiatives or requirements.⁵⁸

The CAA does contain one preemptive provision that sets uniform federal emissions standards on new automobiles and precludes other units of government from issuing their own tailpipe requirements.⁵⁹ Even that provision, however, gives California the right to impose its own separate, more stringent motor vehicle emission limitation upon federal approval of a waiver application, thus promoting experimentation and innovation.⁶⁰ If approved, other states seeking to

54. Jerome M. Organ, *Limitations on State Agency Authority to Adopt Environmental Standards More Stringent than Federal Standards: Policy Considerations and Interpretative Problems*, 54 MD. L. REV. 1373, 1376–86 (1995).

55. See *infra* note 60 and accompanying text.

56. See Adelman & Engel, *supra* note 49, at 296–99.

57. See Buzbee, *Contextual Environmental Federalism*, *supra* note 39, at 123; Ann E. Carlson, *Iterative Federalism and Climate Change*, NW. U. L. REV. 1097, 1139 (2009) (observing mutual interactive learning between federal and state regulators, with a particular focus on the federal law's influence on California's progressive regulations); Buzbee, *Federal Floors, Ceilings, and the Benefits of Federalism's Institutional Diversity*, *supra* note 46, at 110 (noting ongoing incentives for state actors to innovate); Revesz, *Rehabilitating Interstate Competition*, *supra* note 40, at 1228 (providing examples of more stringent state legislation). But see Engel, *State Environmental Standard-Setting*, *supra* note 40, at 316 (finding empirical and theoretical support for state tendency to engage in races to the regulatory bottom).

58. See Buzbee, *Recognizing the Regulatory Commons*, *supra* note 17, at 33 (noting that regulators cannot patent their innovations).

59. 42 U.S.C. §§ 7521(a), 7543(a) (2006).

60. See *id.* § 7507.

reduce their pollution levels have the option of adopting the California motor vehicle standards.⁶¹ This provision creates a presumptive uniform federal requirement, but it also avoids a federal regulatory monopoly and potential laxity by giving California and piggybacking states the ability to impose more stringent requirements.

The right of state or local enforcers, whether agencies or state attorneys general, to investigate wrongdoing further serves as an antidote to complacency that can be fostered during periods of federal laxity.⁶² Similarly, citizen suit provisions in the CAA and other environmental laws place citizens in a critically important role.⁶³ If the federal or state government misses deadlines or issues regulations or permits that are unjustifiably lax, citizens can institute litigation.⁶⁴ States also may utilize this provision. Such suits thus serve to counter potential regulatory capture.⁶⁵ Standing and pleading hurdles created by case law can serve as a barrier to some such suits, but with effective legal representation, most citizen suits can overcome standing barriers. The CAA also creates monetary incentives for bringing sound citizen litigation by allowing courts to award attorney fees and costs to substantially prevailing parties.⁶⁶ The CAA imposes numerous deadlines on regulators that provide citizens an opportunity to commence litigation alleging that federal agencies or regulatory actors have violated discrete, nondiscretionary duties.⁶⁷ Thus, the combination of citizen suit provisions and deadlines allows citizens in most instances to surmount standing and administrative law-based hurdles such as those articulated in standing jurisprudence and *Norton v. Southern Utah Wilderness Alliance*.⁶⁸

61. *Id.* § 7543.

62. Trevor W. Morrison, *The State Attorney General and Preemption*, in PREEMPTION CHOICE, *supra* note 46, at 81, 84–87 (emphasizing the role of state attorneys general).

63. 42 U.S.C. § 7604.

64. *See id.*; Buzbee, *Story of Laidlaw*, *supra* note 42, at 202–03.

65. Buzbee, *Story of Laidlaw*, *supra* note 42, at 202–03 (explaining that citizen suits fill in gaps when government actors fail to enforce the law).

66. *See* 42 U.S.C. § 7604(d).

67. *See, e.g.*, 42 U.S.C. § 7604.

68. *See Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 64 (2004) (holding that a claim under the Administrative Procedure Act to compel agency action can only be upheld when the agency failed to take a discrete and required action); *Friends of the Earth, Inc. v. Laidlaw Envtl. Servs., Inc.*, 528 U.S. 167, 185–88 (2000) (deferring to legislative judgment in

Of particular importance to fostering innovation and creating incentives for reduced pollution is the preservation of common law regimes through savings clauses and linked floor preemption. Even if all regulators and enforcers lean toward laxity, harms resulting from pollution or other despoiling of the environment can give rise to nuisance or toxic tort actions. The possibility of injunctive relief and damage awards, sometimes including punitive damages, will create ongoing incentives for plaintiffs to consider commencing litigation and for industry to reduce risks and harm. Tort and nuisance litigators can learn from regulatory databases and actions, but regulators and legislators also learn from information elicited by common law actions.⁶⁹ Mere compliance with regulatory requirements and permits does not insulate polluters from common law liabilities.⁷⁰

These various federalism-related provisions have the additional benefit of largely eliminating costly and time-consuming industry challenges to state regulatory and common law actions on grounds that they pose a conflict and are preempted by federal law. Stark, unavoidable conflicts remain a possibility and could give rise to preemption claims, but most preemption claims relying on the CAA are likely to be losers. In contrast, the motor vehicle provision, with its limited preemptive reach, has spawned substantial litigation challenging both California's motor vehicle regulations and the efforts of piggybacking states to adopt stringent regulations such as fleet-based emission limitations.⁷¹ The most recent judicial and

citizen-suit provisions in upholding plaintiffs' standing); Buzbee, *Story of Laidlaw*, *supra* note 42, at 214–30 (discussing historical standing obstacles and the Supreme Court's deference to legislative judgments in *Laidlaw*).

69. See Thomas O. McGarity, *The Regulation-Common Law Feedback Loop in Nonpreemptive Regimes*, in PREEMPTION CHOICE, *supra* note 46, at 235, 235–56 [hereinafter McGarity, *The Regulation-Common Law Feedback Loop in Nonpreemptive Regimes*] (discussing mutual learning facilitated through coexistence of common law and regulatory regimes addressing similar risks).

70. See Alexandra B. Klass, *Common Law and Federalism in the Age of the Regulatory State*, 92 IOWA L. REV. 545, 564–65, 579–84, 600 (2007) (arguing for increased emphasis on state common law); see also McGarity, *The Regulation-Common Law Feedback Loop in Nonpreemptive Regimes*, *supra* note 69, at 235; cf. David C. Vladeck, *Preemption and Regulatory Failure Risks*, in PREEMPTION CHOICE, *supra* note 46, at 54, 56–57 (claiming that common law tort claims increasingly are being preempted by federal regulation and articulating reasons to preserve common law regimes despite overlapping regulation).

71. See JAMES E. MCCARTHY, CONGRESSIONAL RESEARCH SERVICE REPORT FOR CONGRESS, CALIFORNIA'S WAIVER REQUEST TO CONTROL GREENHOUSE GASES UNDER THE

regulatory skirmishing resulted in EPA revisiting and reversing an earlier denial of a waiver for California to regulate GHGs from motor vehicles.⁷²

B. New Source Review and Nonattainment Permitting

The CAA's approaches to stationary source permitting and emission limitations set by regulation provide lessons both about effective and dysfunctional regulatory design. The Act utilizes a wide range of strategies, ranging from top-down, agency-set uniform emission limitations under section 111 "standards of performance" for new sources⁷³ to tradable pollution rights.⁷⁴ Tradable pollution rights are one of the earliest precedents for climate change cap-and-trade schemes. Perhaps underappreciated are criteria applicable to permit-set emission limitations that create a ratchet favoring stringent and innovative regulation. They function as "adjudicatory triggers" for stakeholders to assess the most stringent legal requirements or best performers in setting permit requirements.⁷⁵

Section 111 requires EPA to set emissions limitations for major stationary sources of pollution that cause or contribute significantly to air pollution "which may reasonably be anticipated to endanger public health or welfare."⁷⁶ The law requires emissions limitations for

CLEAN AIR ACT 3-5, 12-14 (2007), <http://ncseonline.org/NLE/CRSreports/07Oct/RL34099.pdf>; Rachel L. Chanin, *California's Authority to Regulate Mobile Source Greenhouse Gas Emissions*, 58 N.Y.U. ANN. SURV. AM. L. 699, 702 (2003) (reviewing litigation engendered under these provisions as of 2003); Gale Lee Rubrecht, *EPA Region 3*, AIR QUALITY COMMITTEE NEWSL. (AM. BAR ASS'N SEC. OF ENV'T., ENERGY, & RES., Chicago, Ill.), Aug. 2007, at 13-14, 16 (discussing litigation initiated by the Alliance of Automobile Manufacturers against the State of Vermont following Vermont's adoption of California motor vehicle regulations).

72. California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 74 Fed. Reg. 32,744 (July 8, 2009).

73. 42 U.S.C. § 7411 (2006).

74. *Id.* § 7412(g)(1).

75. An "adjudicatory trigger" framework is a distinctive regulatory design choice offering several advantages over one-time, high-stakes rulemakings. *See, e.g.*, William W. Buzbee, *Adjudicatory Triggers of Enhanced Ambient Environment Information*, 83 IND. L.J. 583, 594 (2008) [hereinafter Buzbee, *Adjudicatory Triggers of Enhanced Ambient Environment Information*].

76. 42 U.S.C. § 7411.

categories of polluters to reflect the “best system of emission reduction,” subject to consideration of countervailing cost and other energy, health, and environmental impacts.⁷⁷ These requirements are set by EPA through a notice-and-comment process.⁷⁸ Such limitations must account for variables such as sizes, ages, and modes of production. Because of information challenges and clashes between industry and environmentalists over regulatory stringency, these section 111 rulemaking proceedings are slow and often followed by litigation. Due to the burdens of such proceedings and the risk that revisions would lead to more stringent control requirements, section 111 regulations are seldom revisited or kept up to date to reflect changing pollution control capacities.⁷⁹ Regulation promulgation includes broad participation rights. Initial deadlines were set by statute, but only limited statutory triggers exist for regulatory revision.⁸⁰ If a governor or state seeks revision in light of new technological developments, EPA must respond. EPA is otherwise under little pressure to revisit standards of performance once they are set. This trend results in antiquated standards that seldom are revisited.⁸¹ Section 111(h) makes clear that normal requirements are to be emission limitations, with technological mandates being the exception.⁸² Apart from that normal preservation of latitude for industry choice of compliance methods, section 111 is a recipe for regulatory delay and inertia.

Similarly, the 1990 Amendments set technology-based standards for hazardous air pollutants, relying on agency leadership and a notice-and-comment process.⁸³ This provision also has been plagued by delays, although fewer than occurred under its pre-1990 version.⁸⁴

77. *Id.* § 7411(a)(1).

78. *See id.* § 7411(g)(6), (h)(3), (j)(1)(A).

79. *See* Blais & Wagner, *supra* note 13, at 1720–25, 1735–36 (finding significant failures to revise antiquated standards and highlighting that there is no mechanism for assimilating technological innovations into industry-wide regulatory standards).

80. *See id.* at 1725–26.

81. *See id.* at 1726.

82. *See, e.g.*, 42 U.S.C. § 7411(h).

83. *See* U.S. GEN. ACCOUNTING OFFICE, AIR POLLUTION: STATUS OF IMPLEMENTATION AND ISSUES OF THE CLEAN AIR ACT AMENDMENTS OF 1990 34 (2000) [hereinafter GAO, AIR POLLUTION].

84. *See id.* at 34–35 (reporting nearly two hundred missed statutory deadlines by EPA); *see also infra* pp. 65–68 (further discussing § 112’s track record both before and after the 1990

Most other CAA provisions relating to stationary sources use a very different regulatory modality. Any possibly existing section 111 standards serve as a floor in setting permit limitations, but other provisions rely not on a regulatory notice-and-comment model but on permit-specific adjudication.⁸⁵ Permit-specific adjudication is subject to governmental and citizen input, under statutorily set criteria or through an early variant on pollution trading in the State Implementation Plan (“SIP”) nonattainment offset scheme.⁸⁶ These strategies to derive pollution-control requirements thus avoid agency delay “ruts” that result in stale regulatory requirements.⁸⁷ Such permit-by-permit scrutiny is far less vulnerable to reliance on outdated standards and information.⁸⁸ For environmental success, such scrutiny depends on the existence of active, knowledgeable environmental advocates other than permitting authorities and the polluter.⁸⁹

Provisions applicable to new stationary sources of pollution in nonattainment areas are perhaps most innovative and favorable to regulatory dynamism.⁹⁰ If a jurisdiction does not meet federal National Ambient Air Quality Standards (“NAAQS”) for a criteria pollutant, potential new sources of pollution are subjected to

CAA amendments).

85. See GAO, AIR POLLUTION, *supra* note 83, at 11.

86. Buzbee, *Adjudicatory Triggers of Enhanced Ambient Environment Information*, *supra* note 75, at 594–95 (explaining that a new source requires offsets from existing sources and that a permit grant under the CAA requires the agency to receive comment about environmental impacts); Robert W. Adler, *Integrated Approaches to Water Pollution: Lessons from the Clean Air Act*, 23 HARV. ENVTL. L. REV. 203, 238–39 (1999) (referring to the permit requirements for new and stationary sources).

87. See Blais & Wagner, *supra* note 13, at 1727–28 (developing the concept of rulemaking ruts and analyzing why they are prevalent).

88. See *infra* p. 67.

89. See *infra* pp. 53–58 for a discussion of how these permit-based strategies can elicit state of the art information, moving pollution control in the direction of greater stringency, and how introduction of such information into permit proceedings is itself a challenge dependent on interested and expert or wealthy stakeholders. Blais and Wagner focus on how “rulemaking ruts” lead to less ambitious agencies or the development of policy through informal processes. Blais & Wagner, *supra* note 13, at 1707. They do not analyze alternative means of reducing pollution such as through these permit-based adjudicatory triggers. See *id.*

90. See Buzbee, *Adjudicatory Triggers of Enhanced Ambient Environment Information*, *supra* note 75, at 594 (noting that a proposed new source in a nonattainment area sets in motion several information searches regarding the environment).

numerous additional requirements.⁹¹ These statutory requirements push environmental performance toward improvement both at the source and jurisdictional level.

First, a new source can only get a permit if, perhaps with the government's assistance, it can identify sources of similar pollution that the new source can somehow shut down in order to obtain needed offsets.⁹² New sources include both newly created sources and sources whose modifications deem them new under the law.⁹³ Basically, offsetting reductions must be found either from the new or modified source itself or from a different pollution source within its nonattainment area, with the amount of the required offset increasing as the level of nonattainment becomes more severe.⁹⁴ These offset provisions make private actors who are interested in operating new sources into engines of environmental improvement and information. The statute creates incentives for them to minimize their own pollution and induce other sources to reduce their pollution as well. The provision also harnesses state and local government desire for new and expanding industry (with the usual associated employment and tax benefits) to prompt improved enforcement and tracking of unnecessarily high polluting sources. This offset provision is, in fact, a form of pollution trading, with NAAQS standards setting the jurisdictional cap level and the source-by-source search for offsets rewarding more efficient, or profitable, or low-polluting entities.⁹⁵ The track record of the offset provision has been mixed, with only a modest use of trades likely due to the lack of an open market for offset trades. The absence of an open and transparent market creates difficulty in finding offset trades; thus, many offset trades have been internal to the same source or source operator.⁹⁶

91. 42 U.S.C. § 7401 (2006).

92. *Id.* § 7412(d)(3).

93. *Id.* § 7411(a)(2).

94. 42 U.S.C. § 7503(c).

95. See Michael C. Naughton, *Establishing Interstate Markets for Emissions Trading of Ozone Precursors: The Case of the Northeast Ozone Transport Commission and the Northeast States for Coordinated Air Use Management Emissions Trading Proposals*, 3 N.Y.U. ENVTL. L.J. 195, 212 (1994) (explaining that the offset provisions of the CAA are forms of federal trading).

96. Robert W. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emission's Trading Program*, 6 YALE J. ON REG. 109, 115 & n.44, 119–23 (1989).

The nonattainment new source offset provision utilizes another complementary strategy that aims to improve environmental performance.⁹⁷ If the local jurisdiction has been found by EPA not to be adequately implementing its SIP, a permit cannot be issued.⁹⁸ This provision thus uses the occasion of a proposed new or expanded business to trigger enforcement of the enforced reality of a jurisdiction's SIP. Similarly, the polluter itself must establish that it is in compliance or on track to come into compliance with its obligations elsewhere in the state.⁹⁹

The SIP process itself also creates incentives for identifying and protecting high-value, low-polluting actors. Each air quality area—which typically are metropolitan areas—has to derive a plan by which the jurisdiction will meet or work to meet the NAAQS requirements.¹⁰⁰ This includes identifying pollution sources and imposing pollution-reduction or cessation requirements on those sources. Inevitable changes in area activities and pollution sources create a rolling obligation to assess the state of air quality and pollution contributors. The SIP process has been plagued by delays and often modest environmental gains.¹⁰¹ And its rolling review attributes can make it hard to determine its status and requirements.¹⁰² Nevertheless, the SIP construct is effective in involving citizens, polluters, and local, state, and federal governments in the investigation, planning, and enforcement process.¹⁰³ A SIP that is

97. Buzbee, *Adjudicatory Triggers of Enhanced Ambient Environment Information*, *supra* note 75, at 595 (explaining the necessary informational searches under new source offset permits).

98. 42 U.S.C. § 7424(b)(1).

99. 42 U.S.C. § 7420(a)(2).

100. 42 U.S.C. § 7410(a).

101. See Howard Latin, *Regulatory Failure, Administrative Incentives, and the New Clean Air Act*, 21 ENVTL. L. 1647, 1688–95 (1991) [hereinafter Latin, *Regulating Failure, Administrative Incentives, and the New Clean Air Act*] (describing mixed track record of SIPs and reasons its complicated requirements are vulnerable to regulatory failure); G. Nelson Smith & Evelio M. Grillo, *Let's Clear the Air Once and for All: Municipal Liability for Failing to Comply with Section 110 of the Clean Air Act*, 44 CATH. U. L. REV. 1103, 1116–28 (1995) (explaining that states often have not met their drafted timetables and that air pollution is still a problem in many major cities).

102. See Robert L. Fischman & Jaelith Hall-Rivera, *A Lesson for Conservation from Pollution Control Law: Cooperative Federalism for Recovery under the Endangered Species Act*, 27 COLUM. J. ENVTL. L. 45, 104 (2002).

103. See Latin, *Regulatory Failure, Administrative Incentives, and the New Clean Air Act*,

illegal or actions in violation of a SIP are subject to citizen-initiated challenges.¹⁰⁴ Reviewing federal officials also can review and reject state SIP choices.¹⁰⁵ Allowances for multiple actor participation, oversight, and lookback and predictive analysis serve as a check on major illegality and create movement in the direction of environmental improvement. Relatedly, the obligation of nonattainment areas to improve air quality under the “reasonable further progress” provision furthers the achievement of that obligation.¹⁰⁶

The provisions setting forth emission limitation criteria for new stationary sources in both nonattainment and attainment areas are especially well designed to reduce pollution levels and encourage cross-jurisdictional analysis and learning. Like all areas of the law, whether a statute fulfills its legal promise is highly dependent on the existence of active, motivated, and knowledgeable citizens or regulators. Citizen or regulatory actors, especially federal officials watching over state and local permitting actions, are able to monitor and check inertia or laxity of polluters or other regulators. Thus, federal oversight or citizen participation and oversight is essential for these provisions to fulfill their promise. Consequently, it must be acknowledged that a statute’s implemented reality often is far below its ideal promise given a frequent lack of rigorous regulators and knowledgeable citizens or nonprofits. Nevertheless, these CAA provisions setting forth criteria for new and modified source levels of pollution control use a creative pro-stringency ratchet that builds on horizontal knowledge gained from other planners and benchmarked best-achieving similar sources. Because this scrutiny in setting pollution control requirements is done through an adjudicatory permit proceeding, each permit proceeding becomes a venue for reexamining what sorts of pollution control are possible.

supra note 101, at 1709 (describing the need for cooperation among state and federal agencies).

104. Eileen Gauna, *Federal Environmental Citizen Provisions: Obstacles and Incentives on the Road to Environmental Justice*, 22 *ECOLOGY L.Q.* 1, 50–57 (noting the availability of citizen-suit provisions and the difficulty of a successful citizen suit).

105. 42 U.S.C. §§ 7410(a), 7413(a).

106. 42 U.S.C. § 7501(1) (defining “reasonable further progress”); *id.* § 7502(c)(2) (requiring “reasonable further progress”).

For example, a new source in a nonattainment region must achieve the lowest achievable emission rate (“LAER”). Importantly, LAER is not determined through a single, industry-by-industry notice-and-comment regulation but in a case-by-case permit-adjudication setting.¹⁰⁷ If a section 111 “standard of performance” exists for that category, LAER cannot be set lower but can be more stringent. LAER itself is a sliding standard pegged to either “the most stringent emission limitation” in any SIP in the nation (unless established by the source to be unachievable) or the most stringent emission limitation “achieved in practice” by similar sources.¹⁰⁸ The “more stringent” SIP requirement and emissions achieved in practice becomes the LAER limitation required of that source. This combination of a permit-based trigger for analysis of emission limitations and the horizontal analysis of most stringent jurisdictions or pollution-reduction accomplishments, combined with any existing section 111 “standard of performance” setting a regulatory floor, makes this provision a dynamic one-way ratchet that updates information and moves toward stringency. The provision’s effectiveness depends on dedicated permittees, federal officials, or citizens engaging in the time- and expertise-intensive process of learning about an industry, other jurisdictions’ SIPs, permits, and levels of pollution.¹⁰⁹ High-visibility permit battles are most likely to generate necessary cross-jurisdictional information. This strategy is not, however, without downsides. Because the new source review (“NSR”) program triggers more stringent pollution-control requirements at the time of upgrade or new construction, it can discourage modernization and prompt production modernization strategies designed merely to evade burdens associated with NSR review.¹¹⁰

107. *See id.* § 7412(d)(3).

108. *Id.* § 7501(3).

109. *See, e.g.,* Buzbee, *Adjudicatory Triggers of Enhanced Ambient Environment Information*, *supra* note 75, at 595 (noting that achieving LAER requires an informational search of SIPs and other pollution sources to determine the benchmark for LAER).

110. Nash & Revesz, *supra* note 25, at 1708–20 (discussing incentives created not to invest in facility improvements due to NSR program burdens); Robert N. Stavins, *Vintage-Differentiated Environmental Regulation*, 25 STAN. ENVTL. L.J. 29, 49 (2006) (“Because of the incentives [NSR] creates to extend the life of older plants rather than build new, more stringently regulated, facilities, concern exists that NSR wastes resources and can retard

Like nonattainment NSR review and the LAER standard, NSR in attainment areas requires major stationary sources to comply with the CAA's requirements to prevent significant deterioration ("PSD") of air quality.¹¹¹ Each facility subject to PSD permit requirements must achieve emissions control consistent with best available control technology ("BACT") requirements.¹¹² BACT is set on a case-by-case basis, similar to LAER-based permitting.¹¹³ It requires horizontal analysis of technology and other controls to determine what is "achievable" for a facility, considering a wide array of factors.¹¹⁴ It pushes sources and regulators less than LAER, but it also requires regulators and stakeholders to update information in determining BACT requirements.

These various adjudicatory-setting, technology-based emission limitations offer an additional benefit, albeit with less direct encouragement of environmental progress. Notably absent from technology-based standards is any requirement that regulators adjust emission limitations in light of nuanced understanding of the surrounding ambient environment, other than taking into account a jurisdiction's attainment status. As others have noted, regulatory strategies setting requirements in light of nuanced attention to the ambient environment would be ideal.¹¹⁵ In reality, however, any requirement to adjust regulatory requirements in light of the ambient environment demands huge resources and levels of scientific and

environmental progress." See generally sources cited in *supra* note 3 (citing sources discussing paradoxical and harmful incentives created by portions of the CAA).

111. 42 U.S.C. § 7471.

112. 42 U.S.C. § 7479(3).

113. *Id.*

114. 42 U.S.C. §§ 7412(d), 7479(3). A wide array of citizen, state, and federally initiated litigation against power plants alleged that many such plants engaged in gradual modifications without making required pollution control investments required under NSR. See Buzbee, *Contextual Environmental Federalism*, *supra* note 39, at 123–25 (recounting the recent NSR litigation). This litigation continues. See, e.g., Darren Samuelsohn, *Obama, Ill. File NSR Litigation against Midwest Generation*, N.Y. TIMES, Aug. 28, 2009, available at <http://www.nytimes.com/gwire/2009/08/28/28greenwire-obama-ill-file-nsr-lawsuit-against-midwest-gen-33512.html?scp=1&sq=nsr&st=cse>.

115. Latin, *Ideal versus Real Regulatory Efficiency*, *supra* note 3, at 1304–20 (contrasting demands of technology-based standards with poor track record of ambient-based regulation); Craig N. Oren, *The Clean Air Act Amendments of 1990: A Bridge to the Future?*, 21 ENVTL. L. 1817, 1825 (1991) (contending that scientific information needed to set ambient environmental quality standards is often lacking).

predictive capacity that remain elusive. By not utilizing nuanced ambient environment analysis, an additional source of delay and resource drain is avoided.

Many permitting proceedings have occurred with little scrutiny, but a number of the more visible and fiercely litigated permitting proceedings have turned on the progress-inducing attributes of technology-based emission limitations. In *Alaska Department of Environmental Conservation v. EPA*, the Supreme Court had to determine federal rights to reject by administrative edict a lax PSD permit not meeting BACT requirements, where the permit had been sought by industry and ultimately approved by senior state regulators.¹¹⁶ The Supreme Court confirmed “EPA’s authority . . . to rule on the reasonableness of BACT decisions by state permitting authorities” and upheld EPA’s rejection due to what appeared to be a state political override of contrary determinations by expert state staff.¹¹⁷ Similarly, in *Deseret Power Plant*, the Sierra Club advocated in an individualized permit proceeding that a power plant be subjected to BACT emission limits for carbon dioxide due to its role as a greenhouse gas.¹¹⁸ That citizen advocacy culminated in a major Environmental Appeals Board decision that even the Board recognized as confirming “an issue of national scope that has implications far beyond this individual permitting proceeding.”¹¹⁹

116. *Alaska Dep’t of Env’tl. Conservation v. EPA*, 540 U.S. 461, 502 (2004).

117. *Id.* at 495.

118. *Deseret Power Electric Cooperative*, PSD Appeal No. 07-03 (Env’tl. Appeals Bd. of the U.S. EPA, Nov. 13, 2008).

119. *Id.* at 4–5 (finding that historical agency interpretation was not a sufficient reason for Region 8 to choose not to impose a CO₂ BACT limit). Sierra Club argued that CO₂ is an air pollutant, so the permit must contain a BACT determination for CO₂. *Id.* at 1. The Region did not make a CO₂ BACT determination. *Id.* In response to the *Deseret Power* decision, then-Administrator Stephen L. Johnson issued a memorandum dated December 18, 2008, that directed the EPA to interpret the definition of “regulated NSR pollutant” of 40 C.F.R. § 52.21(b)(50) “to exclude pollutants for which EPA regulations only require monitoring or reporting but to include each pollutant subject to either a provision in the Clean Air Act or regulation adopted by EPA under the Clean Air Act that requires actual control of emissions of that pollutant.” Memorandum from EPA Adm’r Stephen L. Johnson to the EPA Reg’l Adm’rs, EPA’s Interpretation of Regulations That Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program 1 (Dec. 18, 2008), http://www.epa.gov/nsr/documents/psd_interpretive_memo_12.18.08.pdf. Under the Obama administration, the EPA agreed to reconsider its position that some GHGs, including carbon dioxide, are not subject to regulation. Robin Bravender, EPA Reconsiders ‘Johnson Memo’ on Carbon Emission, N.Y.

Similarly, in an incredibly long permit proceeding in New York City, the proposed Brooklyn Navy Yard waste-to-energy facility was intensively scrutinized in a multi-year proceeding before an administrative law judge, with major environmental groups introducing testimony and monitoring the proceeding.¹²⁰ The idea was to ensure that this facility was operated safely and with minimal pollution and to use the proceeding to inform future similar proceedings.¹²¹ In battling over which pollution reductions were achievable, the environmental groups surveyed similar facilities around the world.¹²²

As federal climate legislation was avoided and later debated, and the ability to regulate GHGs was argued before the Supreme Court in 2006, pressure to regulate greenhouse gases was applied in Georgia.¹²³ The Georgia Center for Law in the Public Interest,¹²⁴ acting on behalf of clients such as the Sierra Club, fiercely litigated emission limitations required for a major coal burning power plant.¹²⁵ In that matter, citizen stakeholders sought to push emission

TIMES, Oct. 1, 2009. For a law firm's concise summary of these actions, see McGuire Woods, *Reading the Tea Leaves: Obama EPA's Granting of Sierra Club Petition to Reconsider Regulations under the Clean Air Act*, Feb. 23, 2009, available at <http://www.mcguirewoods.com/news-resources/item.asp?item=3747>.

120. Brooklyn Navy Yard, N.Y. Dep't of Env'tl. Conservation (Fifth Interim Decision, Sept. 9, 1993) (explaining that in over five years of permit proceedings, the facility had been subject to intensive environmental review by the government and the public). The permit was ultimately granted, *id.*, but a subsequent state law change precluded the incinerator's construction. See N.Y. ENVTL. CONSERV. § 27-0706 (McKinney 2007). The author worked on this matter for the Natural Resources Defense Council on a cooperative basis with attorneys from other environmental groups, including the Environmental Defense Fund.

121. *See id.*

122. William Bunch, *There's the Rubbish, Incinerator Debate Heats Up: Now It's a Matter of Garbage In or Garbage Out-of-State*, NEWSDAY, Feb. 20, 1994, at 1.

123. *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007) (finding that CO₂ and other GHGs qualify as air pollutants under the CAA).

124. The Georgia Center for Law in the Public Interest was later renamed Greenlaw. The Georgia Center for Law in the Public Interest is Now Greenlaw, <http://green-law.org/net/content/go.aspx?s=57253.0.0.19069> (last visited Apr. 10, 2010).

125. *See Longleaf Energy Ass'n v. Friends of Chattahoochee, Inc.*, 681 S.E.2d 203, 209 (Ga. Ct. App. 2009) (finding that the Fulton County Superior Court erred in ruling that the proposed power plant should use Integrated Gasification Combined Cycle technology to minimize pollution in its BACT analysis); *see also* Matthew L. Wald, *Georgia Judge Cites Carbon Dioxide in Denying Coal Plant Permit*, N.Y. TIMES, July 1, 2008, at C4. For a recounting of this history and link to other decisions, see <http://green-law.org/core/item/page.asp?s=83885.0.101.19069>.

limitations down, introducing evidence of low-polluting facilities elsewhere, arguing for limits on carbon dioxide, and garnering national coverage.¹²⁶

In all of these battles, progress was made by applying the substantive criteria of the CAA. In addition, federal oversight and citizen participation ensured that experts, state permittees, and industry had a voice to push for environmental progress. Pollution-trading provisions can also be effective in achieving environmental goals, especially the desire for cost-effective progress. A major question is whether the market's search for low-cost emissions reductions will similarly serve to foment fundamental reassessment of what pollution reductions are achievable.

C. Acid Rain Trading Provisions

The CAA's provisions pertaining to acid rain, which create a sulfur dioxide trading regime, have been much lauded and analyzed.¹²⁷ Due to movement of sulfur dioxide from the Midwest to the Northeast, acid rain was forming and causing numerous harms to water bodies, infrastructure, and buildings.¹²⁸ Sulfur dioxide also posed health risks.¹²⁹ Rather than rely on technological mandates or technology-based emissions limitations, such as BACT, LAER, or New Source Performance Standards, Congress set a downward sliding aggregate cap on sulfur dioxide emissions.¹³⁰ The 1990 Amendments mostly doled out pollution allowances to grandfathered industry participants, and then allowed pollution sources to trade

126. See sources cited in note 125, *supra*; *Longleaf Energy Ass'n*, 681 S.E.2d at 210.

127. See, e.g., Nathaniel O. Keohane, *Cost Savings from Allowance Trading in the 1990 Clean Air Act: Estimates from a Choice-Based Model*, in MOVING TO MARKETS IN ENVIRONMENTAL REGULATION: LESSONS FROM TWENTY YEARS OF EXPERIENCE 194–229 (Jody Freeman & Charles D. Kolstad eds., 2007) [hereinafter MOVING TO MARKETS]; cf. David Schoenbrod & Richard B. Stewart, *The Cap-and-Trade Bait and Switch*, WALL ST. J., Aug. 24, 2009, at A13, available at <http://www.wsj.com> (search “The Cap-And-Trade Bait and Switch”; then follow “The Cap-And-Trade Bait and Switch” hyperlink) (praising simpler forms of cap-and-trade such as the sulfur dioxide trading regime designed to attack acid rain and criticizing elements of the House climate change bill).

128. Karkkainen, *supra* note 21, at 1418 (explaining that pollution from the Midwest affected the Northeast and New England).

129. *Id.* (noting the reduced mortality rates following acid rain regulation).

130. Clean Air Act Amendments of 1990, Pub. L. No. 101–549, 104 Stat. 2399.

among themselves.¹³¹ Over time, an increasing percentage of pollution allowances were sold through auction. The goal was to allow the market to identify the lowest cost emitters, or most profitable polluters, and allow those polluters through trades to determine who would derive the greatest value from buying or selling allowances. Through this trade-based regime, the amendments created incentives to shut down or control high-polluting sources. The dynamism anticipated for the Amendments was based on the promise of the “invisible hand” of the market. This cap-and-trade strategy would harness market incentives to identify low cost or profitable investments in pollution control that, in turn, would generate allowances that could be sold, or avoid polluter need to buy allowances. This market-based regime would thereby ease progress toward reductions in acid rain and other harms associated with sulfur dioxide.

With a uniform type of pollution and mostly large, easily identified sources, creating the market was relatively easy. In addition, such a trading regime avoids placing near-impossible informational burdens on regulators never fully privy to the production process. Rather, pollution sources under this trading regime could undertake analyses of their own production modes, costs, and benefits, and determine optimal means to reduce pollution and sell pollution allowances or minimize the need to buy pollution rights.¹³²

The reality was far less auspicious than sometimes attributed to this program. Allowances were initially allocated by legislative gift to earlier polluters, based largely on historic levels of pollution.¹³³ This grandfathering strategy rewarded large polluters and failed to harness the incentives associated with an auction of allowances. If allowances were auctioned rather than distributed for free under a grandfathering strategy, new and old polluters would have equal opportunities to

131. *Id.*

132. Cf. Karkkainen, *supra* note 21, at 1418–19 (analyzing the informational burdens on regulators and noting that market-based approaches like the one found in the CAA’s acid rain provisions represent a possible solution to informational deficits).

133. See Lesley K. McAllister, *The Overallocation Problem in Cap-and-Trade: Moving toward Strigency*, 34 COLUM. J. ENVTL. L. 395, 399–400 (2009) (discussing overallocation of pollution allowances and effects of free distribution of allowances rather than use of auctions).

play in the market, and all emitters would have immediate monetary incentives to reduce pollution.¹³⁴ Increased demand for allowances would have buttressed the price,¹³⁵ free allowances, in contrast, will depress the price. A second major flaw was the level of the cap itself. The cap was set so high that most polluters had little incentive to improve their operations.¹³⁶ Thus, due to the grandfathering giveaways and the lax cap, technological progress was slow and the market's incentives and rewards were weak.¹³⁷ Early allowance investors dramatically overpaid for pollution rights since market prices quickly dropped¹³⁸ and remained low for years.¹³⁹ Still, this trading regime was successful from the viewpoint of cost-effective achievement of pollution-reduction goals, even if initially too lax. Despite these flaws, the acid rain trading program served as a model for imitation and avoidance in subsequent bodies of regulation, especially climate change legislation and agreements both at the domestic and international level.¹⁴⁰

134. See Scott R. Milliman & Raymond Prince, *Firm Incentives to Promote Technological Change in Pollution Control*, 17 J. ENVTL. ECON. & MGMT. 247, 260–61 (1989) (assessing incentives for pollution control and concluding that taxes or auctioned allowances create the strongest incentives).

135. Chulho Jung et al., *Incentives for Advanced Pollution Abatement Technology at the Industry Level: An Evaluation of Policy Alternatives*, 30 J. ENVTL. ECON. & MGMT. 95, 108–09 (1996) (concluding that auctions will increase prices and foster greater rewards and hence incentives for innovation).

136. In addition, despite any new information about the costs and benefits of sulfur dioxide, the caps could only be changed by an act of Congress. Winston Harrington & Richard D. Morgenstern, *International Experience with Competing Approaches to Environmental Policy: Results from Six Paired Cases*, in MOVING TO MARKETS, *supra* note 127, at 95, 134; McAllister, *supra* note 133, at 399–403 (discussing how under the acid rain trading regime too many allowances were issued and the cap too lax to incentivize and reward polluters investing in means to reduce sulfur dioxide emissions).

137. See David M. Driesen, *Design, Trading, and Innovation*, in MOVING TO MARKETS, *supra* note 127, at 436, 452–53 (reexamining whether technological changes were actually innovations brought on because of the sulfur dioxide trading program).

138. Cf. Harrington & Morganstern, *supra* note 136, at 97–98, 141 & n.4 (explaining that allowances were allocated in proportion to fuel consumption during 1985–87).

139. *Id.* at 135–36 (noting that many facilities made major investments that created a glut and caused the price of allowances to crash).

140. See BRENT D. YACOBUCCI, CONG. RESEARCH SERV., CLIMATE CHANGE LEGISLATION IN THE 109TH CONGRESS 4 (2006), <http://fpc.state.gov/documents/organization/50818.pdf> (“The United States has no federal GHG reduction requirements, though there are proposals to require such reductions. . . . [The] market-based [proposals] typically take as their model the Clean Air Act’s acid rain program.”).

D. State and Local Climate Change Innovations

One brief, additional point should be made about the CAA and its lessons for climate legislation. In the years leading up to Congress's consideration of federal climate change legislation in 2009 and 2010, state and local governments enacted numerous laws to address climate change, utilizing their broad retained authority under the CAA to protect the environment more than required under federal law.¹⁴¹ As discussed above, California and other piggybacking states sought to require GHG limitations on cars, even as the federal legislative and executive branches resisted these regulations.¹⁴² These state and local initiatives have tested diverse strategies to reduce energy usage and directly attack GHG emissions; several states and regions even devised their own cap-and-trade regimes.¹⁴³ In addition to serving as testing grounds and templates for federal legislation, state and local regulation of GHG emissions has served as a catalyst for incipient industry support for a federal law. In this setting, as in past federal environmental legislative dynamics, some industry opponents of federal action have become perhaps reluctant supporters of federal legislation in the hope that federal law will reduce disparities in a "patchwork" of laws or will result in a less onerous

141. See, e.g., Engel, *State and Local Climate Change Initiatives*, *supra* note 39, at 1021–25; Stewart, *States and Cities as Actors in Global Climate Regulation*, *supra* note 39, at 683–88.

142. See *supra* notes 69 & 71 and accompanying text.

143. See generally Matt Bogoshian & Ken Alex, *The Essential Role of State Enforcement in the Brave New World of Greenhouse Gas Emission Limits*, 27 UCLA J. ENVTL. L. & POL'Y 337 (2009); Jim Doyle, *Challenges and Opportunities for Regulating Greenhouse Gas Emissions at the State, Regional and Local Level*, 27 UCLA J. ENVTL. L. & POL'Y 213 (2009); Paul E. Farrell, *Climate Change Action in Connecticut: Linking Energy, the Environment and the Economy*, 27 UCLA J. ENVTL. L. & POL'Y 281 (2009); William Funk, *Constitutional Implications of Regional CO₂ Cap-and-Trade Programs: The Northeast Regional Greenhouse Gas Initiative as a Case in Point*, 27 UCLA J. ENVTL. L. & POL'Y 353 (2009); Ken Kimmell & Laurie Burt, *Massachusetts Takes on Climate Change*, 27 UCLA J. ENVTL. L. & POL'Y 295 (2009); Jim Martin & Ginny Brannon, *A Colorado Perspective: The New Energy Economy*, 27 UCLA J. ENVTL. L. & POL'Y 269 (2009); Mary D. Nichols, *California's Climate Change Program: Lessons for the Nation*, 27 UCLA J. ENVTL. L. & POL'Y 185 (2009); Steve Owens, *Climate Change Action in Arizona*, 27 UCLA J. ENVTL. L. & POL'Y 317 (2009); Douglas Scott, *The Role of Illinois and the Midwest in Responding to the Challenges of Climate Change*, 27 UCLA J. ENVTL. L. & POL'Y 261 (2009); Jared Snyder & Jonathan Binder, *The Changing Climate of Cooperative Federalism: The Dynamic Role of the States in a National Strategy to Combat Climate Change*, 27 UCLA J. ENVTL. L. & POL'Y 231 (2009).

but preemptive federal law.¹⁴⁴ It is critical to recognize that none of these regulatory experiments and innovations would have been possible had the CAA not unequivocally preserved state authority to go beyond the protections offered by federal law.¹⁴⁵

III. CLIMATE CHANGE LEGISLATIVE CHOICES IN LIGHT OF CLEAN AIR ACT LESSONS

The current leading climate bills are the Waxman-Markey American Clean Energy and Security Act of 2009 (“ACES”), as passed by the House of Representatives at the end of June 2009,¹⁴⁶ and the proposed Senate bill, Clean Energy Jobs and American Power Act (“CEJAP”), sponsored by Senators Kerry, Boxer, and Kirk, which emerged in draft form in September 2009.¹⁴⁷ Included within the almost 1500 pages of ACES text is the Safe Climate Act, a bill focused exclusively on addressing climate change.¹⁴⁸ Portions of ACES, the Safe Climate Act, and CEJAP will face additional changes in the Senate. At this point any climate bill faces an uphill battle as partisan gridlock continues to plague Congress. These bills likely will continue to face a well funded opposition campaign by industry, including vast sums for lobbying and support for, if not creation of, grassroots opposition.¹⁴⁹ In addition, a complex array of other

144. Numerous scholars have noted this dynamic. See RICHARD N. L. ANDREWS, *MANAGING THE ENVIRONMENT, MANAGING OURSELVES: A HISTORY OF AMERICAN ENVIRONMENTAL POLICY* 209 (1st ed. 1999); J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1504–08 (2007); E. Donald Elliott et al., *Toward a Theory of Statutory Evolution: The Federalization of Environmental Law*, 1 J.L. ECON. & ORG. 313, 326 (1985); Kirsten H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 *ECOLOGICAL L.Q.* 183, 223–26 (2005) (labeling this phenomenon a “domino effect” in which state regulation triggers industry to prefer federal regulation); Alice Kaswan, *A Cooperative Federalism Proposal for Climate Change Legislation: The Value of State Autonomy in a Federal System*, 85 *DENV. U. L. REV.* 791, 798–803 (2008) (exploring an array of benefits of preserving state autonomy for climate change regulatory goals).

145. See *supra* notes 52–53 and accompanying text (discussing the CAA’s use of a savings clause and floor preemption provisions).

146. References generally will be to H.R. 2454, as passed by the House of Representatives on June 26, 2009. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009).

147. Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. (2009).

148. H.R. 2454 § VII.

149. Editorial, *Another Astroturf Campaign*, N.Y. TIMES, Sept. 3, 2009, at A20 (critically

political challenges, such as wars in Iraq and Afghanistan, a recession and financial crisis, and health care legislation debates, make 2009 and 2010 inauspicious times for a climate bill. But the scientific evidence of climate change and associated risks continues to strengthen, and international efforts to enact a successor to the Kyoto Protocol all create strong countervailing pressures. Thus, a climate bill's prospects are highly uncertain.

Still, the several iterations of leading climate bills have several basic attributes. This Part looks at several of the basic regulatory design choices likely to be included in United States climate legislation. This Part then reflects on such legislation's promise and risks in light of CAA lessons.

The House and Senate bills contain myriad provisions mandating or encouraging far more efficient appliances, home and building construction, renewable energy use, clean transportation, and more efficient cars and modes of transportation.¹⁵⁰ They also support research into and regulation of carbon sequestration. It is anticipated that carbon sequestration technology will allow carbon to be buried or rendered inert rather than emitted as a GHG.¹⁵¹ Many of those provisions have freestanding logic and good prospects since they promise to save money, reduce risk by reducing energy use, and move many areas of United States law closer to requirements elsewhere around the globe. However, these proposed provisions undercut reliance on regulatory strategies that would use the market to sort out the best means to reduce pollution.¹⁵² The federal government is, in effect, picking some of the winners and losers of a post-climate change bill economy. The benefit they provide is to select areas where improvements would generate efficiency and environmental benefits even if a cap does not provide an adequate price signal to reward improvements on its own. In essence, these provisions offer a backstop to sole reliance on market incentives under a cap-and-trade scheme. The bills' provisions focusing on

commenting on industry support for what appear to be grassroots events opposing a federal climate change bill).

150. Most of these provisions appear in ACES Title I ("Clean Energy") and Title II ("Energy Efficiency"). See H.R. 2454 §§ I, II.

151. See *id.* § I(B).

152. See Schoenbrod & Stewart, *supra* note 127 (criticizing ACES on this ground).

technology and incentivizing energy efficiency constitute retention of diverse regulatory strategies to reduce GHG emissions.

Provisions setting up a GHG cap-and-trade regime are the heart of the House and Senate bills.¹⁵³ A climate-oriented cap-and-trade program would set a series of declining caps on annual aggregate GHG emissions and distribute only enough allowances so the cap is not exceeded. Holders of GHG allowances could trade them. The underlying logic is that emitters would best be able to assess cost-effective means to reduce emissions or acquire additional emission rights where necessary. This rewards low emitters and gains in efficiency and helps support a market for innovators in pollution and emission reduction technology.¹⁵⁴ Additionally, polluters could use offset credits in a cap-and-trade regime. With offset credits, polluters would undertake environmentally beneficial activities that reduce GHG levels to generate credits. Those credits then could be used in ways similar to or in lieu of allowances.

Several major caveats must be recognized. Environmental progress and related market incentives are virtually completely dependent on several conditions: that a stringent cap will be set, creating scarcity to reward reductions and innovation; that caps and trades will be well monitored so the market is secure and rewarding; and that surrounding politics will remain committed to GHG reductions.¹⁵⁵ If the cap is set too low, or the market porous, corrupt, or lacking in reinforcing regulatory oversight, or the political realm

153. See H.R. 2454 §§ III, VII, and VIII (forming the heart of the Safe Climate Act). Comparable provisions are in Title VII and VIII of the Boxer-Kerry bill.

154. For articles discussing the basic logic of cap-and-trade regimes, with a focus on its use to address GHGs and climate change, see Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293, 348–53 (2008) (comparing and preferring a cap-and-trade scheme to a carbon tax approach); Richard B. Stewart & Jonathan B. Wiener, *The Comprehensive Approach to Global Climate Change: Issues of Design and Practicality*, 9 ARIZ. J. INT'L & COMP. L. 83, 103–106 (1992) (discussing cap-and-trade in the international context). See also Jonathan B. Wiener, *Radiative Forcing: Climate Policy to Break the Logjam in Environmental Law*, 17 N.Y.U. ENVTL. L.J. 210, 238–42 (2008) [hereinafter Wiener, *Radiative Forcing*] (advocating a cap-and-trade scheme for GHG emissions). For a more critical assessment of the mechanics and track record of cap-and-trade regimes, see McAllister, *supra* note 133.

155. For in-depth exploration of the risk of political unraveling of a climate change deal and the concomitant need for “precommitment strategies,” see Lazarus, *Super Wicked Problems and Climate Change*, *supra* note 29, at 1187–1231.

credibly threatens to weaken the law, then a cap-and-trade bill could easily fail. The following sections reflect on the CAA's lessons for several of the climate bill's most important regulatory choices.

A. Error and Inertia Risks: Mixed Prospects

The CAA is often criticized for its complexity and the many challenging tasks it imposes on EPA.¹⁵⁶ Champions of the cap-and-trade strategy tout the simplicity and elegance of cap-and-trade regimes as a means to empower private actors with greater information to be creative, at less cost.¹⁵⁷ Once created, operational, and stable, this would likely be true. However, the many demands of the leading climate bills would impose a huge array of regulatory deadlines and burdens on EPA and other executive branch actors, creating a likely near-constant state of flux and reexamination that could derail the launch and ongoing implementation of climate legislation. The CAA experience confirms the magnitude of the implementation challenge.

As discussed above, CAA section 111 “standards of performance” for new stationary air pollution sources have been plagued by missed deadlines and antiquated standards, in large part because of the challenging regulatory tasks involved.¹⁵⁸ Similarly, section 112 has been plagued by delays, likely also attributable to onerous demands of notice-and-comment rulemaking. Prior to the 1990 Amendments, section 112, which required EPA to set levels of permissible hazardous air pollutant emissions taking into account health risks, rather than technological capabilities, proved even more of a failure due to the near-impossible task it demanded; with non-threshold hazardous air pollutants, no level of exposure could convincingly be deemed safe.¹⁵⁹ A proposed climate bill would not compel the same

156. See, e.g., Ackerman & Stewart, *Reforming Environmental Law*, *supra* note 3, at 1334–40.

157. See Wiener, *Radiative Forcing*, *supra* note 154, at 238–39.

158. See *supra* notes 18–21.

159. Thomas O. McGarity, *Hazardous Air Pollutants, Migrating Hot Spots, and the Prospect of Data-Driven Regulation of Complex Industrial Complexes*, 86 TEX. L. REV. 1445, 1446–53 (2008) (discussing reasons for failures to implement both the pre-1990 section 112 and analogous “residual risk” provisions within the 1990 amendments).

near-impossible task imposed by the pre-1990 version of section 112. However, the underlying climate change science, politics, and economics would need to be assessed on a near-constant basis under the leading climate bills, arguably presenting an even more formidable challenge. These bills would certainly require a far more massive sequence of tasks for involved agencies and departments, many of whom would be dependent on each other's work.

The climate bills also would impose rigorous analytical periodic reporting and amendment requirements. The bills appear to anticipate the risks of delay and inaction and thus include dozens of specific time deadlines.¹⁶⁰ Moreover, for some of the larger regulatory analytical tasks, the bills create an invited parallel role for the National Academy of Sciences ("NAS").¹⁶¹ NAS is asked to perform the same task of updating information on climate change if EPA fails to do as required.

The many independent EPA obligations are only the tip of the iceberg. In numerous provisions, interested parties can petition EPA to adjust its actions, including petitions regarding centrally important items like the identity of GHGs, their climate potential or equivalence in relation to carbon dioxide, and adjustments to carbon allowances and usable offsets.¹⁶² For many of these tasks, EPA is also obligated to undertake in-depth analysis of health, environmental, and economic effects, sometimes including opportunities for peer-reviewed oversight.¹⁶³ Many of the key operational elements of the climate bills also appear to require pre-implementation regulatory steps; regulatory actions are not just a means over time to correct and tweak the bill as necessitated by changing science, political, and market developments. Instead, they often are a condition precedent to making the bill an implemented reality.

These provisions have the salutary goal and partial effect of avoiding wholesale regulatory imprudence. Thus, major mistakes are checked by regulatory deadlines, reexamination, and petition

160. *See, e.g.*, H.R. 2454, 111th Cong. §§ 735, 737, 740, 792 (2009); S. 1733, 111th Cong. §§ 303, 311 (2009).

161. *See, e.g.*, H.R. 2454 §§ 464, 553; S. 1733 § 354.

162. *See, e.g.*, H.R. 2454 §§ 311, 312, 721(e); S. 1733 §§ 311, 312, 721(e).

163. *See, e.g.*, H.R. 2454 § 113(b); S. 1733 §§ 123(a), 705(a).

provisions. On the other hand, a huge question is whether these many tasks would derail implementation of the cap-and-trade regime so it would not become operational in a timely way. If the Act itself would initiate a cap-and-trade system while allowing for subsequent corrective actions, then these allowances would reduce risks of large scale failure. If they threaten the entire scheme with too much delay and uncertainty, as unfortunately appears likely, they could defeat the entire regime or at least create a lengthy period of legal and carbon market instability.

Thus, these climate bills pose failure risks like that created by CAA sections 111 and 112, both before and after its 1990 amendments, by imposing onerous regulatory and analytical burdens on EPA. They also, however, empower numerous actors to review and check EPA actions and revisit and correct default legislative choices, and thus are somewhat reminiscent of CAA nonattainment provisions' empowerment of numerous actors.¹⁶⁴ The climate bills' onerous review provisions thus serve to avoid enduring error but in the process threaten to create regulatory overload and extensive subsequent litigation.

In climate bill provisions allowing for technology-based regulation of coal-burning power plants and stationary sources not initially subject to capped emissions, these bills rely on a notice-and-comment mode of action to derive emissions limitations. If the CAA's track record holds true here, then utilization of a notice-and-comment regime, without at least an accompanying permit-by-permit opportunity for consideration of more stringent limitations, poses substantial risks of delay and inertia. Without permit-by-permit scrutiny and opportunities for public input, experts, citizens, and not-for-profits would have infrequent opportunities to establish that lower emissions levels are possible and should be required. Although GHGs do not fit easily into an attainment/nonattainment structure with air quality control region-planning as under the CAA SIP provisions, a similar structure could be used with climate legislation. Jurisdictions or perhaps geographic regions could be allocated a GHG cap under which permit-specific pollution reductions could be imposed. As

164. See, e.g., H.R. 2454 § 701(b)(4).

occurred with CAA sections 111 and 112, the climate bills' preference for notice-and-comment regulation of large sources rather than case-by-case emission limitations threatens to lead to delay and outdated limitations.

B. Weakening Federalism's Benefits

The CAA harnesses state action in numerous ways, offering states the option of implementing the statute under delegated program provisions, preserving their ability to be more protective of their citizens and the environment through savings clauses and floor preemption provisions. The CAA also preserves the viability of common law regimes and the ongoing incentives for environmental improvement they create.¹⁶⁵ For example, as discussed above, even where the CAA is preemptive in its provisions regarding motor vehicle emissions standards, it avoids a regulatory monopoly by giving California and piggybacking states the ability to require even more.¹⁶⁶ In addition, the CAA operates by retaining concurrent state, federal, and citizen roles in enforcing the laws both against polluters and governments who might miss obligations.¹⁶⁷

Furthermore, these various CAA provisions provide latitude for experimentation, innovation, and regulatory learning.¹⁶⁸ These CAA provisions created the regulatory space for state and local climate change laws and regional agreements that have led the way in this country in addressing climate change ills.¹⁶⁹

The new federal climate bills reflect ambivalence about the retention of independent and shared state roles. Most significantly, they both would preempt state and regional cap-and-trade regimes for six years after the launch of a federal cap-and-trade regime. In addition, these bills' near-exclusive reliance on a cap-and-trade program would do little to harness the expertise and motivations of federal and state regulators and citizen activists. However, they also attempt to allow states to continue utilizing other strategies and

165. *See supra* notes 12–13, 15–16.

166. *See supra* notes 15–16.

167. *See supra* notes 49 & 51.

168. *See supra* notes 12–14.

169. *See supra* notes 15–16.

statutes to reduce pollution, including GHG pollution, by emphasizing that their provisions would only preempt state efforts that utilize cap-and-trade strategies. On a more specific basis, the earlier provisions of the broader ACES bill create standards for efficiency in several areas and affirm the authority of states to provide additional regulation and similarly directed incentives. However, by picking the particular actors and activities that are favored under the law, these bills would undercut the ability of states or the market to make different choices.

For reasons that are unclear, some provisions in these bills leave the scope of state power uncertain due to some potentially contradictory provisions. Both bills amend the CAA's savings clause, but keep most of its original CAA savings clause language, so state authority to regulate GHGs is preserved. As mentioned above, they also preserve state authority to regulate GHG emissions through means other than cap-and-trade markets during and after the six year preemptive period.¹⁷⁰ However, ACES expressly precludes regulation of GHGs under numerous CAA provisions.¹⁷¹ These provisions appear targeted at EPA but are not limited solely to it. In fact, they do not identify exactly who is disempowered. This is problematic because many state air pollution laws were enacted in order to receive delegated program status from EPA. Many of these state laws were expressly intended to carry out the programmatic tasks in the CAA that, as amended, would now prohibit consideration of GHG emissions as the basis for regulation. Could states rely on their now freestanding state laws that were enacted to comply with the CAA and regulate GHGs where EPA is forbidden to do so? The answer appears to be affirmative, but the language and section interactions leave the resulting law far less than lucid. In addition, a scattered series of savings clauses within the overall ACES bill could create arguments that only specified state authorities are in fact preserved.¹⁷²

170. See S. 1733, 111th Cong. §§ 124, 125 (2009); H.R. 2454, 111th Cong. §§ 334, 335 (2009).

171. H.R. 2454 §§ 332, 617, 831–35.

172. See, e.g., *id.* §§ 102(o), 144(e), 610(k), 721(d).

CEJAP would avoid this conundrum by preserving EPA's CAA authority.¹⁷³

Relatedly, a critical question is whether state and local governments could impose their own additional GHG emission requirements on polluters and also preclude them from profiting by selling potentially unused allowances to polluters in other jurisdictions.¹⁷⁴ Without such authority, state efforts to speed climate change progress would be futile, since the emissions would just result elsewhere, a phenomenon generally characterized as "leakage."¹⁷⁵ A source with excess allowances could simply sell them to other jurisdictions unless the state could somehow preclude such use. The climate bills appear to allow such limitations.

Still, the lack of a meaningful state role in allocating pollution allowances after initially grandfathered allowances taper means that ultimately several sorts of additional state and local GHG emission constraints could still be vulnerable to the leakage problem. A jurisdiction that chooses to require more stringent levels of control might disadvantage its own industry and tax base; the production and the benefits it would create would simply go to bidders in other jurisdictions. States wishing to lower overall levels of GHG emissions either would have to buy and retire the allowances with their own money, retire allowances, or charge more in allowances per emission unit. These sorts of measures could cause governmental or private sector fiscal hardship but at least would allow states to act to reduce national emissions. Both the Senate and House bills preserve state power to take such actions.

In addition, two key provisions of ACES regulating coal plants and other major stationary sources of GHGs not subject to cap limitations set new performance standards akin to those in section 111.¹⁷⁶ This regulatory design choice poses its own risks of inertia, as

173. See, e.g., S. 1733 § 125.

174. This paragraph's exposition of the interaction of leakage risks and federalism is explored in greater depth in William W. Buzbee, *State Greenhouse Gas Regulation, Federal Climate Change Legislation, and the Preemption Sword*, 1 SAN DIEGO J. CLIMATE CHANGE & ENERGY L. 23 (2009).

175. See Jonathan B. Wiener, *Think Globally, Act Globally: The Limits of Local Climate Policies*, 155 U. PA. L. REV. 1961, 1967 (2007).

176. H.R. 2454 § 311.

mentioned above. For federalism purposes, the problem is that these two provisions contain no provision-specific language reaffirming state and local governments' ability to require more stringent permit limitations due to GHG concerns.

The absence in either leading bill of a new broad cross-cutting climate regulation savings clause and lack of opening findings or policy declarations applauding state climate regulation opens the door for preemption claims when a state chooses to act in a new and innovative way. The amended CAA savings clause language within the time-limited cap-and-trade preemptive period should preserve state authority to do more to combat climate change, but contrary arguments are somewhat tenable. Since numerous agencies are given roles in these bills and numerous statutes amended, even better would be the addition of a broadly sweeping savings clause and related findings applicable to the enacted climate legislation. Such a provision would greatly reduce the risk of subsequent preemption resulting from statutory ambiguity.

The cap-and-trade amendments to the CAA pose several additional problems. A time-limited preemption would undercut investment in and utilization of state programs. In addition, as now appears likely, if the federal cap is more lax than existing state and regional cap-and-trade regimes, then the economic pressure and rewards they could offer would be undercut. Even more problematic, if the many pre-implementation regulatory requirements that EPA and other regulators must flesh out through new regulations and implementation steps lead to delay in launching the federal program, then under ACES a time gap could exist between state and regional plans and a federal regime. CEJAP appears to avoid this by delaying the preemption phase until the federal program is operational.¹⁷⁷

The political price to build an enacting coalition supportive of a climate change bill may be that Congress will in effect have to buy major industry support with large, valuable allowances giveaways. As a matter of sound policy, however, an approach giving a greater role to states would work far better. This approach would divide up

177. See S. 1733 § 125 (amending the CAA by adding section 861(b), which appears to trigger the preemptive period upon the first auction of allowances if the federal program is delayed).

allowances among the many states, giving each state the choice of how to use and allocate allowances. The formula allocating allowances to states would itself be a major and inherently political battle requiring consideration of population size, economic vitality, and pollution sources, among other likely variables.

Nevertheless, if most allowances were distributed to states for state-determined allocation decisions, instead of Congress itself giving away most allowances for free, it could generate several benefits. First, states are closer to their economic, social, political, and environmental needs and goals and could tailor their distribution choices. They might even decide to auction the allowances, or give them to consumers. The latitude provided states would be akin to that provided to states under the CAA's SIP regime. Greater latitude for policy innovation would be created. Using the states to distribute allowances would also address the leakage problem by allowing a state simply to withhold some allowances if the state believed federal caps were too lax. The state could then choose how many to auction and whether to retire some, thereby driving progress even if the federal cap proved to be inordinately lax. It is highly unlikely, however, that Congress would surrender to states these distributional choices given the political attention and reward they could generate for federal legislators.

In addition, the hundreds of tasks and deadlines that would be imposed on federal agencies, especially EPA, coupled with the task of overseeing the integrity of the allowance and offset regimes and related trading, are a recipe for overload and regulatory failure. In contrast, many states, local governments, and regions have substantially more experience than does the federal government in encouraging greater energy efficiency, attacking climate change causes and effects, and setting up and monitoring GHG cap-and-trade markets. Perhaps the federal government should take another page from the CAA book and create delegated program structures whereby states could assume an array of climate change regulatory roles. Such structures would provide latitude for diverse approaches to encourage climate change improvement, potentially including some latitude for diversity in how jurisdictions monitor a cap-and-trade market. At a minimum, a broad, climate bill-wide citizen suit provision empowering citizens and states to take enforcement actions against

private and governmental violators could help ensure that even during periods of regulatory inattention or sloppiness, the law's requirements could be enforced and the cap-and-trade market's integrity protected.

C. Trading Regulatory Diversity of Strategies and Stakeholders for Market Dynamics

The climate bills broadly trade the CAA's diverse regulatory strategies and broad empowerment of numerous actors, both public and private, for legislation that would rely overwhelmingly on market dynamics to drive progress. Many climate bill provisions choose or favor some preferred winners with special allowance allocations and subsidies, but broad progress will depend primarily on the cap and a viable trading market.

Scientists emphasize the need to act quickly and bring emissions down, but the federal bill delays the regulatory day of reckoning until 2012. Even then, it starts with cap levels that, both as initially set and ratcheted down over time, may be too lax to play an appropriate part in arresting climate change. This would create two substantial risks. First, if the cap is too lax to stem climate change trends, then harmful environmental feedback loops may accelerate; later reductions may be too late. Second, a lax cap would, by its nature, not create the scarcity that would drive innovations. Without high allowance costs or the promise of profits through pollution reductions and development of means to reduce energy use or GHG emissions, innovation incentives would be weak. Unlimited ability to bank allowances would further reduce innovation rewards and associated incentives, but banking at least would create rewards for polluters making early GHG pollution reductions. With delay and the ongoing risk of subsequent weakening of a climate change law, incentives for early investments in climate-related technological innovations would be undercut.

Once caps start declining to the level where polluters feel the pinch and innovators see the reward, then a cap-and-trade regime would facilitate cost-effective progress. Through reliance on the market-based climate scheme, there should be less information-intensive regulatory standard-setting plagued by industry opposition

and strategic use and misuse of information.¹⁷⁸ However, before that point, the bills would do little to require polluters or others to take easy steps to increase energy efficiency or reduce GHG emissions. As mentioned above, states can seek to require more progress, but leakage risks are real. Large polluters and users of energy may for years face little or no incentive to improve.

On the enforcement side, the leading bills do not contain explicit new citizen suit language, as was proposed in earlier discussion drafts. They also, however, do not delete or undercut ongoing reliance on the CAA's current citizen suit provision, and much of these bills would amend the CAA. Other provisions, however, hand regulatory turf to an array of governmental actors, with ACES perhaps most importantly delegating responsibility for offsets to the Department of Agriculture ("USDA") or over market integrity to the Commodities Futures Trading Commission ("CFTC").¹⁷⁹ It is far from clear how the CFTC, USDA, and other agencies' roles will be checked or supplemented by citizen or state participation and litigation. States under the CAA have long relied on citizen suit and participation provisions to justify challenges to illegal or delayed federal actions and for suits against polluters. The USDA and CFTC do not have the same track record and experience working with delegated programs and citizen and state involvement. As suggested above, a statute-wide citizen suit provision would be a major statutory improvement. Unlike under other environmental laws where citizen suits are virtually always a threat to industry, citizen suits could be critical to a climate cap-and-trade bill's success. After all, investors and stakeholders (other than intentional defrauders) in a cap-and-trade market would depend on the market's integrity and scarcity of pollution rights to protect their investments. In a market of this size and complexity, a multiplicity of enforcers would protect stakeholders' investments, while of course helping to weed out bad actors.

In addition, the leading bills would hand out most pollution allowances for free at the beginning, most to existing pollution sources, but others to favored entities most likely due to political

178. See Karkkainen, *supra* note 21, at 1416–17.

179. H.R. 2454 §§ 351, 503.

clout, to gain votes necessary to enact climate change legislation, or to reward favored activities. By not auctioning allowances, initial market incentives to reduce pollution are undercut. Furthermore, by using a grandfathering strategy that largely rewards existing polluters, new market entrants are disadvantaged and fewer entities will be players. The government also does not get substantial auction revenues it otherwise could use to subsidize related research and development. The net result is to further slow incentives for improvement and reward large polluters. If the government instead auctioned allowances or gave most allowances to citizens who could choose where to use or sell allowances, large polluters would not be rewarded by the law and consumers would have greater freedom to make market choices. With allowance giveaways, Congress chooses the winners, even if they are undeserving.

As mentioned above, distribution of most or many allowances to states would be better. States could then tailor their distribution strategies to their own diverse conditions and priorities. Some provisions do provide small allowance percentages to state and local governments but typically require use of the allowances to further federally specified goals. Despite the ostensible reliance on market dynamics in the cap-and-trade system, the federal selection of allowance winners ends up skewing the market toward entities, industries, and strategies that are believed to be worthy of support. It would perhaps be better, and certainly more flexible, if federalism's benefits were recognized and state and local governments had a larger role in allocating allowances with sensitivity to changing and diverse needs, prospects, and goals. Better yet would be allocations by auction, but such a strategy is unlikely since it would fail to buy off industry opponents with the wealth represented by pollution allowances.

CONCLUSION

The CAA offers many lessons. Its diverse regulatory strategies have created an ongoing experiment in regulatory design choice. Its trading-based schemes—ranging from the SIP process, to nonattainment permit-driven offset requirements, to the 1990 Acid Rain cap-and-trade regime—offer obvious lessons for potential

climate legislation, with its own likely use of a cap-and-trade regime. Other CAA provisions offer more general lessons about effective legislative design, among them the benefits of cooperative federalism structures and overlapping implementation and enforcement roles for federal, state, local, and citizen actors.

Unfortunately, some of the CAA's less effective strategies, especially those relying on high-stakes notice-and-comment standard-setting based on best available technology performance standards, are part of climate proposals. The CAA also contains more effective and dynamic permit-by-permit schemes that require the updating of information and benchmarking of most stringent control requirements or accomplishments. These permit-based adjudicatory triggers offer a distinctly different and arguably effective backup regulatory strategy but are not explicitly embraced in leading climate legislation. Due to the current latitude left for ongoing state climate change experiments, under the CAA, states might use permitting decisions as a moment to push progress, but current federal climate legislation does not require any such progress, unlike the LAER and BACT provisions in the CAA.

Relatedly, the CAA's substantial reliance on cooperative federalism structures includes delegated programs, savings clauses, and regulatory floors, all of which have facilitated experimentation and allowed state climate change leadership. That state and local climate activism, in turn, has provided a template and served to catalyze support for federal climate legislation. The leading climate bills generally preserve state authority, but they do so with some poorly drafted choices likely to engender litigation over federal and state roles. Stronger affirmation of the ongoing value of climate-related regulation, and perhaps giving states larger climate roles, especially through delegated program structures and a major role in distributing allowances, would help harness the dynamism and diversity potentially provided by states.

In addition, federal law may prove too lax and enforcement too porous. If climate legislation empowers states, local governments, and citizens to play enforcement roles and choose more stringent controls, that latitude could prove critical to climate change progress. Faced with a formidable challenge like climate change, legislators should pay attention to the CAA's lessons and utilize strategies that

will prompt progress and innovation. A cap-and-trade scheme can foster dynamism and progress but can also lead to laxity and undercut innovation incentives. Legislators should hedge their regulatory bets, learning lessons from the CAA and retaining substantial roles for the states.