

Saint Louis University Public Law Review

Volume 20
Number 1 *Ten Years After the Clean Air Act
Amendments: Have We Cleared the Air?*
(Volume XX, No. 1)

Article 8

2001

Cooperative Federalism and the Clean Air Act: A Defense of Minimum Federal Standards

Douglas R. Williams
Saint Louis University School of Law

Follow this and additional works at: <https://scholarship.law.slu.edu/plr>



Part of the [Law Commons](#)

Recommended Citation

Williams, Douglas R. (2001) "Cooperative Federalism and the Clean Air Act: A Defense of Minimum Federal Standards," *Saint Louis University Public Law Review*. Vol. 20 : No. 1 , Article 8.
Available at: <https://scholarship.law.slu.edu/plr/vol20/iss1/8>

This Article is brought to you for free and open access by Scholarship Commons. It has been accepted for inclusion in Saint Louis University Public Law Review by an authorized editor of Scholarship Commons. For more information, please contact [Susie Lee](#).

COOPERATIVE FEDERALISM AND THE CLEAN AIR ACT: A DEFENSE OF MINIMUM FEDERAL STANDARDS

DOUGLAS R. WILLIAMS*

In 1990, ambient air quality in over 100 American cities fell short of health-based standards established pursuant to the Clean Air Act, known as national ambient air quality standards (NAAQS).¹ In population terms, more than 112 million Americans were breathing air that posed significant risks to their health.² The villain in this pollution story is ground level ozone.

In the ten years since these dim statistics were brought to public attention and Congress amended the Clean Air Act to address the problem, many urban areas have made modest progress in reducing ambient concentrations of ozone. During this period, the number of areas officially considered to be in “nonattainment” of the ozone NAAQS declined from 101 to 34.³ Nonetheless, nearly 50 million people live in areas that still do not meet the ozone NAAQS.⁴

With a bit of luck, many of the areas in which ambient ozone levels currently exceed the NAAQS may attain the ozone standard sometime before 2005, although that prospect is fraught with uncertainty.⁵ But if this may be

* Professor of Law, Saint Louis University School of Law. My thanks to Jeff Lewis for his encouragement and support, to Connie Wagner for her patience, and to Amy Hoch and Ryan K. Manger for their unflagging efforts in support of the symposium.

1. 42 U.S.C. § 7409(a).

2. See H.R. REP. NO. 101-490, 101st Cong. 146 (1990), reprinted in COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, U.S. SENATE, II A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 3170 (1993). Because of variances in ozone concentrations within areas, it is likely that the number of persons actually exposed to unhealthy levels of ozone is somewhat less than the figure cited in the text. Nonetheless, “ozone . . . is . . . the pollutant most likely to have fairly uniform concentrations throughout an area.” *Id.* at 3219.

3. See ENVIRONMENTAL PROTECTION AGENCY, GREEN BOOK HOME PAGE, CLASSIFICATION OF OZONE NONATTAINMENT AREAS, at <http://www.epa.gov/oar/oaqps/greenbk/ona.html> (last visited March 1, 2001) [hereinafter GREEN BOOK].

4. See GAO, *Status of Implementation and Issues of the Clean Air Act Amendments of 1990*, GAO/RCED 00-72, at p. 9 (2000); ENVIRONMENTAL PROTECTION AGENCY, NATIONAL AIR QUALITY AND EMISSIONS TRENDS REPORT 36 (2000) [hereinafter TRENDS REPORT].

5. This prediction is based on the effects of EPA’s finding that many states contribute significantly to nonattainment of the ozone standards in downwind states and its requirement that these upwind states reduce their emissions of nitrogen oxides, which contribute to the formation of ozone in downwind areas. See *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000), *cert. denied*, 69 U.S.L.W. 3297 (U.S. March 5, 2001) (No. 00-632).

regarded as a bit of good news, there is some devastating bad news: the existing ozone NAAQS is not adequate to protect public health.⁶ Thus, even persons living in areas currently deemed to be in attainment of the ozone NAAQS may be breathing air that poses a significant risk to their health. The existing ozone NAAQS is set at .12 parts per million (ppm), averaged over a one-hour period.⁷ In 1997, EPA revised the standard downward to .08 ppm, averaged over an eight-hour period. Although the new standard remains under a legal cloud,⁸ its primary legal difficulties do not relate to the conclusion that exposures to ozone in concentrations of less than .12 ppm (the existing standard) pose considerable health risks to citizens, but rather concern how much lower than .12 ppm the standard should be set and what sort of explanation the courts will demand of EPA in justification of the standard.⁹ Thus, from a public health perspective, air quality is far poorer than is currently and officially recognized. Approximately 120 million people now live in areas that currently fail to meet the revised, .08 ppm standard.¹⁰ Additionally, eight-hour ozone concentrations in 25 national parks and rural sites increased during the 1990's, posing threats to agricultural productivity and ecosystem health.¹¹ Even assuming that the new eight-hour standard will eventually be implemented, it is likely to be many more years before that standard is widely attained. Thus, almost ten years after the passage of the Clean Air Act Amendments of 1990 (CAA), one might very well conclude that, despite considerable efforts, tens of millions of Americans and the generations to follow them are fated to breathe unhealthy air.

The extent of continuing ozone nonattainment is troublesome, and not only because of the associated health risks. In 1990, Congress legislated aggressively to attack the ozone problem, imposing strict requirements on ozone nonattainment areas.¹² It was anticipated that, once implemented, these

6. See generally EPA, National Ambient Air Quality Standards for Ozone, 62 Fed. Reg. 2 (July 18, 1997).

7. 40 C.F.R. § 50.9.

8. See *Whitman v. American Trucking Ass'ns*, 121 S. Ct. 903 (2001).

9. The D.C. Circuit had concluded that EPA's explanation for the new ozone standard violated the nondelegation doctrine because the agency had failed to identify a decisional standard that sufficiently constrained the agency's discretion. *American Trucking Ass'n, Inc. v. EPA*, 175 F.3d 1027, 1034 (1999). The Supreme Court recently reversed this holding and sent the case back to the D.C. Circuit for further review. *Whitman*, 121 S. Ct. at 919.

10. ENVIRONMENTAL PROTECTION AGENCY, LATEST FINDINGS ON NATIONAL AIR QUALITY: 1999 STATUS AND TRENDS, at 5 (2000).

11. *Id.* at 8.

12. See 42 U.S.C. §§ 7511-7511a. Several scholars have attacked the requirements of 1990 amendments as too stringent. See, e.g., Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, Symposium Issue, found and bound in 14 YALE J. REG. 23, 58 (1996) (describing costs of 1990

requirements would bring most (but not all) areas into attainment before the beginning of the new millennium.¹³ It is now clear that Congress underestimated the difficulties of putting effective pollution control measures in place, just as it had in 1970 and again in 1977, when it amended existing legislation to address persistent air pollution problems like ozone.¹⁴

This state of affairs focuses critical attention on existing institutional arrangements for handling air quality problems generally, and ground level ozone in particular. Much of the critical attention in recent years, however, has not focused on why we may have failed to secure more widespread attainment of the ozone standard or how we might better our efforts to do so. Instead, scholars have begun to question whether it makes for good policy to seek attainment of the ozone NAAQS in all areas of the country. Some scholars have concluded that the costs of attaining the standard in many areas dwarf any benefits we could reasonably hope to gain through more cleanup.

To be sure, this is hardly a new criticism. From their very birth in 1970, national ambient air quality standards have been attacked as irrational and grossly inefficient because they ignore variations in the harms associated with pollution and the costs of pollution control from geographic area to geographic area. As Professor Krier put it in 1974:

[S]ince the costs of pollution and the costs of control vary across the country, it is difficult to see how a uniform standard can begin to take the varying costs into account. The standard that minimizes total costs for a region in Iowa is hardly likely to do so for all the regions of California or New York or Colorado as well. To require adherence to the same stringent standard everywhere will in many areas result in the imposition of control costs which are much larger than the pollution costs avoided.¹⁵

Amendments as “staggering” and concluding that “there is little reason to believe that there will be a significant return on the resources invested in the process”).

13. After areas were initially classified under the terms of the 1990 CAAA, all but ten urban areas were expected (and legally obligated to develop plans sufficient) to meet the ozone NAAQS. The ten remaining areas were: Baltimore, Philadelphia-Wilmington-Trenton, Sacramento, and Ventura County, California—which are expected to meet the standard by 2005; Chicago-Gary-Lake County, Illinois, Houston-Galveston-Brazoria, Milwaukee-Racine, New York-Northern New Jersey-Long Island, and California’s Southwest Desert—expected to meet the standard by 2007; and, lastly, Los Angeles, whose problems are probably hopeless—expected to meet the standard by 2010. See GREEN BOOK, *supra* note 3. The combined population of these areas is pretty large—roughly 55 million people—but as the text recounts, roughly 80% more people are exposed to unhealthy levels of ozone than was expected if the 1990 CAAA’s goals were met.

14. For a brief history of the Clean Air Act and Congress’s efforts to deal with the problem of nonattainment, see ARNOLD W. REITZE, JR., AIR POLLUTION LAW 155-61 (1995).

15. James E. Krier, *The Irrational National Ambient Air Quality Standards: Macro- and Micro-Mistakes*, 22 U.C.L.A. L. Rev. 323, (1974); see James E. Krier, *On the Topology of*

Failure to attain health-based federal standards, on this view, may or may not be viewed as a problem prudently to be solved. It all depends on whether the costs ozone air pollution imposes on citizens of particular areas are greater or less than the costs those citizens would have to bear to attain and maintain the ozone NAAQS. In more general terms, this critique attacks the very idea of “health-based” air quality standards, implicitly arguing that the purpose of any air pollution control program should not be to protect public health or the environment, but rather to “maximize welfare” or to achieve an efficient allocation of resources by reducing wasteful uses of air resources. “Wasteful” uses of air resources, on this view, are those that impose greater societal costs (or yield fewer societal benefits) than competing uses. Thus, in narrow efficiency terms, dedicating air resources for the use of breathers and to ensure healthy ecosystems may be wasteful if the aggregate benefits of these uses are less than the benefits foregone by those who are required in some measure to limit their uses of air resources as a pollution sink.

If one accepts the initial premise of efficiency-related critiques of federal standards—that environmental quality is susceptible to meaningful treatment and analysis as a marketable good that is no different in principle than the legendary widget—two additional issues must be addressed. First, federal uniform standards based only on the health effects of particular pollutants are problematic from an economic perspective only if those standards impose costs in excess of benefits in one or more areas of the nation to which they apply. If the federal standard achieves net benefits in areas where pollution control costs are at their highest, then it cannot be said to be “irrational” to impose that standard everywhere—so long as the federal standards do not preempt more stringent local efforts to protect environmental values.

If we assume, however, that uniform federal standards impose costs in excess of benefits in at least one area in the nation, then a second issue that must be addressed, but is missing in Professor Krier’s classic criticism of uniform federal standards, becomes more pertinent. That issue concerns the appropriate level of aggregation for analysis—*i.e.*, the appropriate area or analytic unit within which the costs and benefits of air quality standards are to be assessed and an appropriate regulatory program designed and implemented. This is an important consideration because the standard that yields the greatest benefits relative to costs may vary across levels of aggregation. At one extreme, for example, the costs of pollution control for an individual facility are very likely to exceed the consequent benefits to that facility. Yet, all would agree that in this situation the cost-benefit analysis is far too narrowly focused to inform public policy. More relevant for purposes here, an air quality

standard may be net beneficial for the nation considered as a whole, but impose costs in excess of benefits, perhaps even grossly so, for a particular locality, state, or other jurisdictional unit.

Professor Krier's critique assumes that aggregating at the national level is inappropriate and that the appropriate analytic unit is some geographic area that is less inclusive than the nation as a whole. While Professor Krier hints that the states may be a better jurisdictional unit for air quality regulation, he does not tell us how that conclusion was reached. Given our constitutional structure, state environmental standards may well represent the most salient alternative to federal standards. Moreover, there may be efficiency-related reasons independent of the standards themselves for relying on the states, such as reducing the costs of creating effective decision-making institutions by relying on pre-existing institutional structures. Aside from these considerations, however, there is no a priori reason to rely on states and "federalism" as an efficiency-enhancing alternative to federal environmental regulation.

Clearly, however, arguments for turning environmental regulation over to the states have increased dramatically in recent years and many of these arguments are based on the idea that the states should be considered the "optimum environmental jurisdiction."¹⁶ Invoking notions of federalism, these arguments are often coupled with a claim that, in the absence of some compelling justification for federal intervention in the field of environmental protection, it is the states that should be responsible for determining a desirable level of environmental quality and for selecting the control measures requisite to achieving and maintaining that level. The end-point of these arguments is the same: the federal government should simply bow out or drastically limit the scope of its regulatory authority.

Critics of federal environmental regulation have concluded that federal regulation is warranted only if one or more of the following conditions obtain: (1) a "race-to-the-bottom" in which states, fearing competition from other states, relax environmental standards to suboptimal levels, and thus sacrifice social welfare, to attract or retain mobile capital investment; (2) the pollutant in question generates "interstate externalities"—that is, state regulation of the pollutant does not ensure that some significant amount of the pollution will not be transported to other states; (3) economies of scale, such as centralized research and technological knowledge, are so extensive at the federal level that they outweigh other, supposed inefficiencies associated with federal regulation; and (4) public choice problems are greatly more prominent at the state level than they are at the federal level, effectively permitting favored

16. See Richard O. Zerbe, *Optimal Environmental Jurisdictions*, 4 *ECOL. L.Q.* 193 (1974).

interests to dominate state policymaking.¹⁷ Each of these conditions represents, in now-fashionable terms, a species of “market failure”—an imperfection in the manner in which “property rights” are defined or the presence of “transactions costs” that prevent markets from working the magic of assuring that resources are devoted to their highest valued uses.¹⁸ From this perspective, any notion that a national commitment to environmental quality can properly be viewed as an attempt to place environmental quality beyond the reach of market determinism—perhaps because that commitment is viewed as a moral imperative or that environmental quality is a “right” that all individuals, no matter where they live, can legitimately invoke—is dismissed as romantic or worse.¹⁹ For proponents of economism, to describe and address environmental degradation as anything other than a question of how to allocate resources efficiently is to speak nonsense.

Assaults on federal environmental regulation often are pitched at a high degree of generality, usually starting from the premise that federal standards are “uniform,” and therefore, inefficient. A careful review shows that, while the CAA can plausibly be described as mandating uniform national standards,

17. These justifications are outlined in various places in the scholarly literature. One of more extensive catalogs is Richard B. Stewart, *Environmental Quality as National Good*, 1997 U. CHI. LEGAL F. 199, 205-10 (1997). See also William W. Buzbee, *Brownfields, Environmental Federalism, and Institutional Determinism*, 21 WM. & MARY ENVTL. L. & POL’Y REV. 1 (1997); Joshua D. Sarnoff, *The Continuing Imperative (But Only from a National Perspective) for Federal Environmental Protection*, 7 DUKE ENVTL. L. & POL’Y F. 225 (1997); Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341 (1996) [hereinafter *Interstate Externalities*]; Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570 (1996); Peter P. Swire, *The Race to Laxity and the Race to Undesirability: Explaining Failures in Competition Among Jurisdictions in Environmental Law*, 14 YALE L. & POL. REV. 67 (1996); Susan Rose-Ackerman, *Environmental Policy and Federal Structure: A Comparison of the United States and Germany*, 47 VAND. L. REV. 1587 (1994); Richard B. Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196 (1977) [hereinafter *Pyramids of Sacrifice*].

18. For a general discussion of why environmental degradation may appropriately be viewed as a symptom of one or market failures, see Esty, *supra* note 17, at 574-84. Professor Esty himself, however, seems at times to suggest that this sort of market deterministic view of welfare and value is a bit flimsy. See *id.* at 646 (noting that “[a] Kantian cosmopolitan perspective in which each person defines himself politically at least in part as a citizen of the world is an inescapable reality in the realm of environmental policy”).

19. As a sample of a typical “economic” response to the notion that environmental quality can be viewed as a moral imperative, consider the following assertions, which plainly reveal an enthusiasm for markets that rises to the level of religious fervor:

The most reliable guide for the moral ideals of a polity as diverse as the United States lies in the revealed preferences of its citizens—that is, in the willingness of its citizens to pay for environmental quality. Appeals to the moral ideals of the nation are often thinly disguised appeals to authority when more substantive policy justifications are lacking.

Butler & Macey, *supra* note 12, at 52.

that description obscures more than it clarifies practices under the CAA. Two general points illustrate this. First, the Clean Air Act's national ambient air quality standards do not, in fact, require all areas to achieve or maintain the same level of air quality. The Clean Air Act specifically mandates air quality that is better than the NAAQS in some areas and permits any state to select a standard that is more stringent than the NAAQS if the state so chooses. Thus, federal air quality standards are minimum, not "uniform," standards and may vary from area to area. Second, in practice, the CAA's standards are not enforced even as minimum standards. Especially with ozone, much variation in air quality from state to state and area to area has been and continues to be tolerated, even in areas where the costs of air quality improvements may not be as high as they would be in other areas. Moreover, few, if any, consequences befall areas that fail to meet minimum federal standards. To a large extent, therefore, critics of "uniform" national air quality standards are making "merely theoretical" arguments, ignoring the "slippage" in practice between the written standards and practice.²⁰

Notwithstanding this slippage, I shall argue that the written mandates of the Clean Air Act, seeking minimum levels of air quality throughout the nation, are warranted for a number of reasons. First, there are a variety of uncertainties about the environmental consequences of eliminating federal air quality standards and handing regulatory authority over to the states. Moreover, the case that state regulation would yield greater societal benefits is weak, resting on a number of rather implausible assumptions about state behavior in response to devolution. Accordingly, while there are a number of problems with federal air quality regulation—most of which are unrelated to ambient air quality standards—the relative success of the Clean Air Act strongly supports a cautionary approach to devolution. Second, federal minimum air quality standards may obviate a number of barriers to effective regulation of pollutants that states are likely to face. Finally, drawing upon

20. See Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENVTL. L. REV. 297, 298, 300 (1999):

The essential picture of regulation in much of the environmental literature is that Congress passes a law, federal agencies implement the program (usually through rulemaking), and compliance follows in due course. Of course, everyone knows that this is not the whole story, because sometimes there is slippage along the way. Still, this is the paradigm, and much effort is devoted to attacking, defending, or reforming it. . . .

But we seriously misunderstand the regulatory system if we ignore the pervasive effect of compliance issues on the system as a whole. The problem of obtaining compliance—and sometimes, even knowing what "compliance" means—is pervasive. Regulatory slippage is as central to environmental law as water resistance is to aquatic life—a ubiquitous condition that limits efforts at movement and shapes the design and development of everything it surrounds.

Professor Richard Stewart's conclusion that environmental quality has come to be regarded as "national good,"²¹ I argue that federal minimum air quality standards represent a responsible approach to ensuring innovative and effective measures to protect the public health and welfare.

I. THE MYTH OF "UNIFORM" FEDERAL AIR QUALITY STANDARDS: LAW AND "SLIPPAGE"

Much of the discussion and criticism of federal environmental regulation rests on a premise that is somewhat misleading, at least in the context of federal air quality standards. That premise is that federal regulation imposes "uniform" standards. In fact, the Clean Air Act prescribes only minimum ambient standards and, moreover, these minimum standards are not the same for all areas of the nation. While some critics of federal regulation briefly mention these important aspects of the Clean Air Act, they are prone to ignore them and move quickly to explain why federal "uniform" standards are ill-conceived.²² A more accurate portrait of federal air quality regulation would recognize that, in some circumstances, federal ambient standards are not uniform in law and certainly not uniform in practice. In this section, I briefly describe the range of ambient standards contemplated by the Clean Air Act and then describe with greater particularity the provisions relating to ozone nonattainment areas and how those provisions have been implemented.

The basic structure of the Clean Air Act is built around the centerpiece of federal national ambient air quality standards (NAAQS) for particular pollutants, currently six, which are promulgated by the Environmental Protection Agency (EPA).²³ These standards are supposed to represent the minimum level of air quality that, "allowing an adequate margin of safety, [is] requisite to protect the public health."²⁴ In considering criticisms of federal air

21. Stewart, *National Good*, *supra* note 17.

22. For example, Professor Revesz, in challenging the race-to-the-bottom rationale for federal regulation, acknowledges that federal air quality standards are not, in fact, uniform, but then slips into a practice of describing federal air quality standards as "uniform. 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, 1222 (1992) ("uniform federal standards actually might reduce social welfare") (emphasis added); see also Butler & Macey, *supra* note 12, at n.55 (describing federal air quality standards and concluding that "[t]he imposition of uniform national standards must reduce the social welfare of many communities"); Krier, *Topology*, *supra* note 15 (directing criticism at "uniform ambient quality standards").

23. See 42 U.S.C. §§ 7409(a); *Whitman*, 121 S. Ct. at 907 (describing NAAQS). The six pollutants for which NAAQSs have been promulgated are sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen dioxide, and lead. See 40 C.F.R. Part 50.

24. 42 U.S.C. § 7409(b)(1). These health-based standards are formally designated as "primary" NAAQS. EPA is also required to promulgate "secondary" NAAQS, which "shall specify a level of air quality the attainment and maintenance of which . . . is requisite to protect

quality standards, it is important to distinguish between ambient standards, such as the NAAQS, and emissions standards, such as motor vehicle tailpipe emissions standards. Because the NAAQS are ambient standards, they do not in themselves require pollution controls for any particular source.

Emissions controls can be distributed over a range of polluting sources and activities with varying degrees of stringency and costs. The variety of sources that emit ozone precursors is in some areas quite large, so choices about which sources to regulate and how stringently to regulate them can be quite complex. This distribution of control requirements can be an important factor—indeed, the most important factor—in how large the aggregate costs of attaining the NAAQS will be.

Under the 1970 Clean Air Act, the federal government's role in selecting emissions controls to achieve the NAAQS was important, but quite limited. Federal emissions standards were contemplated for only two categories of sources: motor vehicles²⁵ and new or modified stationary sources.²⁶ The larger and politically sensitive task of selecting controls for existing sources and activities was left to the states. Each state was responsible in the first instance for developing a state implementation plan (SIP) “which provides for implementation, maintenance, and enforcement of [the NAAQS] in each air quality control region (or portion thereof) within such State.”²⁷ Thus, the states can provide selective incentives for particular sources by choosing to regulate them more or less stringently than other sources. Moreover, given the wide variability in air quality throughout the nation at the time Congress enacted the 1970 Act, some areas would be faced with requirements to impose extensive and sometimes costly control measures, while other areas would be required to impose very few, if any, controls to attain the NAAQS.

Without more, this simple description of the Clean Air Act might indeed lead one to conclude that the legislation mandates “nationally uniform” ambient standards, though not nationally uniform emissions controls. The Clean Air Act does not, however, prevent states from adopting air quality

the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” § 7409(b)(2). For purposes of this article, I will ignore the secondary standards, which for ozone is the same as the primary standard. 40 C.F.R. § 50.9(a).

25. Pub. L. No. 90-604, § 6(a), 84 Stat. 1690 (1970).

26. *Id.* at § 4(a), 84 Stat. 1683. The 1970 Act also included provisions for emissions limitations on stationary sources of hazardous air pollutants, which are air pollutants that pose serious health risks but are not regulated by ambient standards. *Id.* § 4(a), 84 Stat. 1685. Reductions of hazardous air pollutants may in some cases contribute to attainment of the NAAQS, but the regulation of these sources is not designed to facilitate compliance with the NAAQS.

27. *See* 42 U.S.C. § 7410(a)(1) (“Each State shall . . . adopt and submit to [EPA] . . . a plan which provides for implementation, maintenance, and enforcement of [the NAAQS] in each air quality control region (or portion thereof) within such State.”).

standards more stringent than the NAAQS.²⁸ States are thus free to set standards or mandate pollution controls that yield a mix of environmental quality and industrial activity different from the mix that would obtain if the NAAQS were adhered to everywhere, so long as the standards the states select yield air quality that is at least as good as, or better than, that required by the NAAQS.²⁹ An accurate description of federal standards, therefore, is that they are national *minimum* standards. Necessarily, then, critics of federal ambient air quality standards do not object to their “uniformity,” but rather to their strictness. If the NAAQS were set at the lowest level desired by any state, and were not preemptive of more stringent state standards, then the NAAQS represent a federal mandate to which the states would willingly adhere. Of course, such a standard would be useful only to the extent that federal involvement produced some effective supplement to state regulation that, if absent, would impair the states’ ability to maintain the NAAQS or a preferred more stringent standard.

But even allowing for stricter standards, the simple portrait of the Clean Air just painted masks a much richer and diverse picture. As the statute is currently written, different areas are subject to different federal standards, both of the ambient and emissions varieties. While the 1970 Act did treat all areas of the country the same in terms of prescribing minimum ambient standards, subsequent amendments do not mandate the same result.

The applicable ambient standard varies from area to area in two ways under the statute: (1) the minimum level of air quality to be achieved or maintained; and (2) the date on which the applicable ambient standard must be attained. These variations are the result of Congress’s decisions, first, in 1977 to treat “dirty air areas” and “clean air areas” differently, and then in 1990 to treat “dirty air areas” differently depending on just how “dirty” each area is.

A. *Variations in Ambient Standards for “Clean Air Areas”: The PSD Program*

When it became clear that many areas of the country would not come even close to attaining the NAAQSs by the 1970 Act’s statutory deadline, Congress in 1977 amended the Act to extend attainment dates and to refine SIP requirements. For present purposes, one of the more important choices Congress made in 1977 was to divide the country into nonattainment areas and “clean air areas” and to impose specific SIP requirements for both types of areas. The resulting programs introduced variation not only in the SIP requirements, but also variation in the minimum level of air quality the areas would be required to achieve or maintain.

28. See 42 U.S.C. § 7416.

29. *Union Electric Co. v. EPA*, 427 U.S. 246, 265 (1976).

The 1977 amendments codified an elaborate Prevention of Significant Deterioration (“PSD”) program that prescribes the allowable level of air quality degradation to be permitted in areas classified as “attainment,” or “clean air,” areas—areas with air quality that is better than that required by a NAAQS.³⁰ The effect of the PSD program, at least for some pollutants, is to establish ambient air quality standards that vary depending on two variables: an area’s pre-existing air quality and choices by the states about how much degradation in air quality is consistent with their own respective policies and needs.

The complexities of the PSD program are notorious, but for present purposes a simple sketch illustrates the basic point that federal law does not impose “uniform” ambient air quality standards. The PSD program is implemented through a permit program for new and modified “major emitting facilities.”³¹ For a permit to issue, such facilities must, *inter alia*, employ the “best available control technology [BACT] for each pollutant subject to regulation under [the Clean Air Act],”³² and demonstrate that “emissions from construction or operation of such facility will not cause, or contribute to, air pollution in excess” of (1) specified increases in the ambient concentration of NAAQS pollutants, known as “increments”; (2) the NAAQS; or (3) “any other applicable emission standard or standard of performance under [the Clean Air Act].”³³ If the BACT levels of pollution control are insufficient to maintain ambient concentrations of a pollutant within the applicable limits, the source must either implement more stringent control measures or seek emissions reductions from other, existing sources that contribute to ambient levels of the pollutant in the area.³⁴

By focusing on new and modified sources and mandating BACT, the PSD program rather directly affects the states’ abilities to manipulate environmental standards to achieve the states’ desired mix of environmental quality and economic activity, for it is at the point of such significant new investment that firms may be most apt to consider different locations. Yet, within the federal standards governing the PSD program, the states retain some, albeit limited, discretion. States may, as noted above, select air quality standards that are

30. See 42 U.S.C. §§ 7470-7479. For detailed descriptions of the PSD program, see generally Craig Oren, *Prevention of Significant Deterioration: Control-Compelling v. Site Shifting*, 74 IOWA L. REV. 1 (1988); NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMY OF SCIENCES, ON PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY (1981); M. William Hines, *A Decade of Nondegradation Policy in Congress and the Courts: The Erratic Pursuit of Clean Air and Clean Water*, 62 IOWA L. REV. 643 (1977).

31. See 42 U.S.C. § 7475. Major emitting facilities are defined at 42 U.S.C. § 7579(1).

32. 42 U.S.C. § 7475(a)(4).

33. 42 U.S.C. § 7475(a)(3).

34. See Oren, *supra* note 30, at 27.

more stringent than federal minimum standards. States' ability to relax air quality standards is drastically more limited, but within the PSD program there is room for some adjustments of this sort.

The extent to which air quality will be permitted to degrade in particular areas subject to the PSD program depends on the size of the applicable increment and on the areas' air quality at a particular point in time—the areas' respective “baseline dates.” The applicable increment will depend on whether the area is classified as a Class I, Class II, or Class III area, with Class I areas having the smallest increment and Class III areas having the largest increment.³⁵ For each of these classes, the statute (or EPA by regulation) establishes the applicable increment in air quality degradation to be permitted.³⁶ The increment is expressed in terms of a maximum allowable increase in concentrations of particular pollutants, subject to the requirement that ambient concentrations may not otherwise exceed the applicable NAAQS.³⁷

The size of the increments do not vary within each of the three classifications—i.e., all Class II areas are subject to the same allowable increment. Nonetheless, the applicable ambient standard will vary from area to area. This is because the applicable PSD ambient standard will be equal to the sum of the fixed increment and the “baseline concentration” of the particular pollutant in each PSD area. The baseline concentration is defined as “the ambient concentration levels [of a particular pollutant] which exist at the time of the first application for a permit in an area subject to [the PSD program], based on air quality data available in [EPA] or a State air pollution control agency and on such monitoring data as the permit applicant is required to submit.”³⁸ This baseline concentration will, of course, vary from area to area. As a result, the applicable ambient standard for one PSD area may also be different from the ambient standard for another PSD area, even if those areas are placed in the same Class, due to variability in the ambient concentration of particular pollutants on the areas' respective “baseline date.”³⁹ For example,

35. See 42 U.S.C. § 7473.

36. The statute sets maximum allowable increases for sulfur dioxide and particulates. See 42 U.S.C. § 7473. For other pollutants, EPA is required to promulgate regulations which “provide specific measures at least as effective as the increments established” for sulfur dioxide and particulates. 42 U.S.C. § 7476(d).

37. 42 U.S.C. § 7473(b)(4).

38. 42 U.S.C. § 7479(4); see also *Alabama Power v. Costle*, 636 F.2d 323, 374-76 (D.C. Cir. 1980) (discussing “baseline date”).

39. See Oren, *supra* note 30, at 23. Professor Oren describes the PSD standards as “tertiary” standards, distinguishing them from the primary and secondary NAAQS.

[T]he sum of the increments and the pre-existing baseline concentration amounts to a kind of “tertiary” standard controlling the maximum level of pollution in any clean air

the ambient sulfur dioxide standard (expressed as the annual arithmetic mean concentration of sulfur dioxide in micrograms per cubic meter of air) for an area designated as a Class II area, and a corresponding allowable increment of 20 micrograms per cubic meter of air,⁴⁰ with a baseline concentration of 50 would be 70, whereas the ambient standard for an area with a baseline concentration of 40 would be 60. Once the baseline concentration has been established and the appropriate increment selected, states must prevent air quality from deteriorating beyond the prescribed level.⁴¹

The amount of growth in emissions that a particular area may permit—the size of the applicable increment—depends on whether the area is designated as a Class I, Class II, or Class III area. Areas of special federal concern—*e.g.*, large national parks and national wilderness areas—are placed in the most protected classifications, Class I or Class II, and may not be redesignated to a less-protected class.⁴² The restrictive standards for these areas are not properly subject to the same criticism usually leveled against the NAAQSs, for in such areas federal interests properly dominate state or local interests.

All other areas are designated as Class II areas.⁴³ Importantly, most areas designated as Class II areas by the statute may be redesignated by states or tribal authorities as either Class I or Class III areas.⁴⁴ The PSD program thus permits areas to make some decisions about the desired mix of economic activity and environmental quality.⁴⁵ A state seeking to encourage new or modified major sources to locate in the state could be expected to redesignate Class II areas as Class III areas to accommodate the maximum concentration of pollutants permissible under the CAA, and thus, lower the costs to new and modified sources.⁴⁶ Surprisingly, however, no state has yet chosen to

area. Unlike the [NAAQS], though, the tertiary standard is not uniform; rather, it varies according to the baseline concentration in each area and the classification of the area.

Id. at 28.

40. *See* 42 U.S.C. § 7473(b)(2).

41. *See* 42 U.S.C. § 7471; *see Alabama Power*, 636 F.2d at 361-64 (discussing obligations of states to protect increments).

42. 42 U.S.C. §§ 7472(a), 7474(a)(1)-(2). Protected national areas originally designated as Class II areas may be redesignated as Class I areas. *See id.* § 7474(a).

43. 42 U.S.C. § 7472(b).

44. 42 U.S.C. § 7474(a).

45. *See* John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183 1196 (“The PSD program explicitly permits economic development that will degrade air quality to some extent, and there are provisions (admittedly they are procedurally burdensome) that permit each state to adopt either a relatively pro-development or more environmentally protective PSD program.”).

46. *See* Final Rule, 59 Fed. Reg. 12853 (Mar. 18, 1994) (“Class III increments allow for higher levels of industrial growth.”).

There are certain fixed costs imposed on new or modified major sources, regardless of where these sources choose to locate. All such sources must comply with the BACT requirement,

redesignate any Class II area as a Class III area.⁴⁷ Put in slightly different way, no state has yet found it necessary or appropriate to sacrifice air quality to achieve desired economic goals, at least for those pollutants to which the Class designations are applicable and for those areas that currently enjoy air quality better than the level of the NAAQS.

The absence of effort on the part of states to redesignate Class II areas to Class III areas suggests that, for at least some pollutants, federal minimum standards do not impose serious constraints on industrial activities in large portions of the nation. In fact, all areas of the nation are considered PSD areas for one or more pollutants for which a NAAQS has been established.⁴⁸ Accordingly, the PSD program is applicable nationwide.

Nonetheless, it would be improper to conclude that experience under the PSD program permits a conclusion that federal standards do not hamper states' choices about the appropriate mix of air quality and industrial activity. First, the PSD program is a pollutant specific regime. Thus, an area can be a PSD area for one or more pollutants, while also being designated as a nonattainment area for one or more pollutants. While all areas are subject to the PSD program, new or modified major sources of pollutants for which an area is in nonattainment are subject to a different regulatory program that, *inter alia*, effectively precludes such sources from contributing to further air quality degradation.⁴⁹ Thus, the NAAQS place rather strict limits on the ability of

for example. BACT standards are set by reference to federal criteria, but they are not nationally uniform; BACT is determined on a permit-by-permit basis. *See* 42 U.S.C. § 7479(3) (defining best available control technology as a that which is determined on "a case-by-case basis" to meet statutory criteria). Thus, states have some discretion to manipulate the BACT requirement to reduce costs to industry, although EPA has issued guidance designed to control the exercise of that discretion. *See* Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR), Notice of Proposed Rulemaking, 61 Fed. Reg. 38250, 38,272-73 (July 23, 1996) (describing EPA BACT determination methodology) [hereinafter *NSR Proposed Rulemaking*]. Cost savings for new or modified major sources can be expected from a larger increment in situations in which either the increment has already been consumed or states seek to allocate the remaining available increment among present and future sources. In these circumstances, a new or modified source may be required to seek offsetting reductions from existing sources in the area to ensure that the new or modified source's emissions do not cause the available increment to be exceeded. For discussion, see Oren, *supra* note 30, at 30-40.

47. *Id.* at 25-26 (noting that "[t]here is . . . no area carrying the Class III designation").

48. For example, all areas of the country currently meet the NAAQS for nitrogen dioxide. *See* TRENDS REPORT, *supra* note 4, at 14.

49. New or modified "major stationary sources" in nonattainment areas are subject to a permitting program established pursuant to 42 U.S.C. § 7503. Among other things, to gain a permit, major sources must offset their pollutant emissions by obtaining emissions reductions of that pollutant from existing sources. *Id.* § 7503(c). For some pollutants, including ozone, the ratio of new emissions to offsetting emissions reductions from existing sources that a new major source must secure increases with the severity of nonattainment. *See* 42 U.S.C. §§ 7511a(a)(4),

nonattainment areas to select a mix of economic activity and environmental quality.

Second, increments within the PSD program have not been established for ozone, which is the most widespread air quality problem in the nation. As presently structured, the PSD program includes increments for only three pollutants: sulfur dioxide, particulate matter, and nitrogen dioxide.⁵⁰ Without established allowable increments for ozone, the only ambient standard that must be satisfied under the PSD program for ozone is the NAAQS.

Despite these limitations, for many areas of the nation, perhaps most, it seems plausible to conclude that the NAAQS have not required states to sacrifice economic growth to achieve compliance with air quality standards. If this is right, it significantly blunts the force of the standard efficiency-related criticism of federal air quality standards.

B. Variations in the Ozone NAAQS for Nonattainment Areas

There are, of course, many areas that currently do not meet the ozone NAAQS. If the ozone NAAQS is impairing economic growth in derogation of local preferences, as critics charge, it would be within these areas that we could expect to find the proof. On the other hand, because the areas are not currently satisfying the federal ozone standard, we cannot be sure of the costs associated with achieving air quality consistent with the NAAQS. Given the complexities associated with either of these inquiries—which I concede to be beyond my capacity—a surrogate inquiry may be useful in assessing the extent to which the ozone NAAQS exacts welfare losses in particular areas. We might ask, in relation to nonattainment areas, what costs states face by virtue of their nonattainment status. For purposes of this analysis, “costs” are limited to the sanctions or penalties federal law exacts for noncompliance. If these noncompliance costs for any particular area are significant, but noncompliance continues, we could plausibly conclude that the NAAQS standards impose costs in excess of benefits in that area, otherwise a state interested in maximizing welfare would choose to comply rather than face the costs of noncompliance. By contrast, if states face no costs, or only minimal costs, for noncompliance, a “rational,” welfare-maximizing state will simply ignore the NAAQS and opt for air quality that the area believes achieves the appropriate mix of economic activity and environmental quality. In these circumstances, we could plausibly conclude that the NAAQS do not exact welfare losses for particular areas.

7511a(b)(5), 7511a(c)(10), 7511a(d)(2), 7511a(e)(1)-(2). For a general overview of the requirements applicable to new or modified major stationary sources, see NSR Proposed Rulemaking, *supra* note 46, at 38,253-55.

50. See 40 C.F.R. § 51.166(c); *Sierra Club v. Thomas*, 658 F. Supp. 165 (N.D. Cal. 1987).

Before considering these issues, it is necessary, first, to get a working idea of what “compliance” with the NAAQS means under the provisions of the Clean Air Act.

1. The Meaning of “Compliance” and “Nonattainment”

As mentioned above, in 1977, Congress began to classify areas into PSD areas and nonattainment areas. This decision was largely in recognition of the widespread failure to attain and the political and economic unacceptability of continuing to treat nonattaining areas as being “in violation of the law” with the threat of sanctions. The importance of the 1977 amendments formalizing a class of areas as “nonattainment areas,” and subjecting this class to requirements different from those applicable to clean air areas, lies in the recognition that an area may be in “nonattainment” with the NAAQS, but still be in “compliance” with the Clean Air Act. Few critics of “uniform” federal environmental standards have regarded the distinction between compliance with the statute and attainment of the NAAQS as significant. Clearly, however, if areas are deemed to be in compliance with the statute by achieving a level of air quality that is somewhat less clean than the NAAQS and may delay attainment of the NAAQS for a period of several years without incurring sanctions, the welfare effects of the statute are likely to be considerably different than the welfare effects of a statute that required immediate attainment.

Under the 1977 amendments, little variation in regulatory treatment among nonattainment areas appears to have been contemplated. All such areas were required to attain the ozone NAAQS as “expeditiously as practicable, but . . . not later than December 31, 1982,” unless attainment by that date was not possible, “despite the implementation of all reasonably available measures.” In such a case, attainment could be postponed until December 31, 1987.⁵¹ All such areas were required to revise their SIPs to include various requirements, such as provisions for implementing “all reasonably available control measures as expeditiously as practicable,” “reasonably available control technology” for existing sources, and a permit program for major new or modified stationary sources.⁵² Yet, given the generality of most of these requirements, nonattainment areas with vastly different SIPs were deemed to be in compliance with the statute.

In the 1990 amendments, Congress departed from past legislative practice and concluded that it would be inappropriate to treat all ozone nonattainment areas the same or to set general SIP requirements that vested large amounts of discretion in the states and EPA. Different treatment of different areas was

51. Pub. L. No. 95-95, § 129(b), 91 Stat. 746 (1977).

52. *Id.*, 91 Stat. 747.

deemed appropriate in apparent recognition of the difference in the rates that areas could reasonably be expected to attain the NAAQS. As a result, the 1990 Act places ozone nonattainment areas into one of six categories, depending on the seriousness of the areas' ozone problems.⁵³ The classification system effectively prescribes different ambient standards for each classification. It does so by varying the deadlines by which areas in the respective classifications are required to attain the ozone NAAQS. Areas with ozone concentrations just above the NAAQS were required to attain the ozone NAAQS by 1993, while areas with the most severe ozone problems were given until 2010 to achieve the NAAQS.⁵⁴

This extended period for attainment can be explained as a way to incorporate costs and feasibility considerations into the design of the ambient standards, where otherwise such considerations are prohibited.⁵⁵ Extended attainment dates can be expected to reduce the total costs of attaining the NAAQS in a number of ways—e.g., permitting older polluting equipment to be used for more of its economic life before it must be replaced with cleaner technologies; providing a longer opportunity for the innovation and development of low-polluting technologies, such as alternative-fuel vehicles, and making these technologies available at lower cost; and enabling firms to phase-in less polluting technologies over longer periods of time, reducing the overall costs of doing so.

The 1990 amendments did, however, purport to limit the discretion of states in terms of the timing of certain controls and in ways that Congress deemed reasonable. To be in “compliance” with the 1990 amendments, as with the 1977 amendments, states with nonattainment areas had to enact and implement various SIP revisions in accordance with fixed statutory schedules, and demonstrate attainment by the applicable attainment date. To be sure, these requirements are complex, but on their face, the statutory requirements seem by degrees considerably more precise than those of the 1977 amendments. In theory, then, it should be a relatively straightforward matter to determine whether any particular nonattainment area was in compliance with the statute, regardless whether it had attained the NAAQS. In practice, however, determining whether a state with an ozone nonattainment area is in compliance (officially and non-officially) with the statute has proven to be a considerably more complex issue.

2. Slippage: Variance Between Practice and Statute

53. See 42 U.S.C. § 7511(a). The are classifications are marginal, moderate, serious, severe, severe-17, and extreme.

54. *Id.*

55. See *Whitman*, 121 S. Ct. at 903.

The foregoing discussion indicates that the Clean Air Act makes provision for varying ambient air quality standards, and thus, criticisms premised on the notion that federal law requires uniform standards to be met is somewhat misleading. Efforts to accommodate the varying costs of achieving the NAAQS are accounted for both in the PSD program, which actually imposes variable standards, and the special provisions for ozone nonattainment areas in the 1990 Act, which do not vary the standard to be achieved, but provide for longer time frames and differential SIP revisions for compliance in areas where an immediate or short-term requirement to attain the NAAQS might be considered unrealistic or excessively costly.

The variability in ambient standards permitted by the Clean Air Act is, however, relatively modest, and for nonattainment areas the variation permitted is unlikely to satisfy critics' concerns about the inefficiencies they claim are the inevitable consequence of uniform national standards. Yet, within the constraints of the ozone NAAQS, much greater variation in actual air quality, and control requirements, is permitted in practice than one might expect from an analysis of the statute alone.

A more pragmatic assessment of the NAAQS would consider the fuller institutional framework within which the permissible—or at least tolerated—concentration of ozone for any particular area is determined. As a rough guide for such an assessment, the following variables would seem pertinent: (1) the ozone NAAQS; (2) state decisions concerning whether to adopt a standard more stringent than the NAAQS; (3) the area's attainment date; (4) the applicable requirements governing SIPs; (5) the manner in which EPA (and the courts) interpret regulatory requirements; (6) the rigor with which statutory requirements for ozone nonattainment areas are enforced by EPA and the courts; and (7) the extent to which SIP control measures selected by a state and approved by EPA actually yield the expected (or claimed) reductions in ambient ozone levels. The last three factors are rarely considered by critics of federal standards, but the relevance of these factors to their efficiency claims seems obvious and critical. As Professor Farber argues:

[C]ompliance with standards is frequently delayed, incomplete, or even nonexistent. Thus, standards may commonly function as starting points in the lengthy interactions between agencies and regulated parties, rather than as end points of compliance. . . . The optimum "standards" for these purposes may well be quite different from (and often harsher than) the ultimate performance level that we wish to attain.

To the extent this situation holds true—to the extent, that is, that slippage is widespread—it is far from clear that the standards themselves should reflect an optimum balance of compliance costs and environmental benefits. The fact that the standards are sometimes too harsh—that they have compliance costs that are too high compared with benefits—may be perfectly reasonable. In

effect, the standards may merely be the government's opening demand in negotiations, and the final bargain is likely to be more favorable to the other side. . . . Thus, the criticism that regulatory standards are too harsh loses some of its force, once it is recognized that the standards are often only partially implemented.

Similarly, attacks on the "one size fits all" nature of regulation also lose some of their force once slippage is taken into account.⁵⁶

In considering the potential for "slippage" it is useful to start with the basic division of responsibilities between EPA and the states under the Clean Air. This structural arrangement, which vests responsibility to implement source-specific control measures almost entirely in the states, virtually invites variation between the statute as written and the statute as implemented in circumstances where the state's interests diverge from strict compliance with the statute. Professor Dwyer, for example, has concluded that "[a]lthough it has as much legal authority as it needs, the federal government cannot implement its air pollution program without the substantial resources, expertise, information, and political support of state and local officials."⁵⁷ Similarly, Professor McGarity, has observed that the Clean Air Act's "system of dual responsibility . . . has given state and local institutions a great deal of flexibility to make concessions to local economic and political constraints in addressing local pollution problems."⁵⁸

Often "concessions" to state and local preferences take the form of rather direct deviations from statutory requirements, but such deviations are often clouded by technical issues, making them difficult to identify. Moreover, the available methods to hold institutions and practices accountable once deviance from statutory requirements is apparent are cumbersome and, to a considerable extent, have not been ineffective.⁵⁹ As a consequence, the Clean Air Act in

56. Farber, *supra* note 20, at 315-16; see Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 *CAP. U. L. REV.* 21, 57 (2001) (noting that under-enforcement may "represent 'bottom up' efforts to improve the rationality of the command statutory system in light of practical experience with its implementation," that the aim of slippage, "like that of formal cost-benefit analysis and risk analysis, is to avoid imposing regulatory costs that are disproportionate to benefits and to conserve administrative resources for higher priority environmental protection tasks," and that slippage "can accordingly be regarded, in many cases, as pragmatic applications of cost-benefit analysis and risk regulatory prioritization") (footnotes omitted).

57. Dwyer, *supra* note 45, at 1224.

58. Thomas O. McGarity, *Missing Milestones: A Critical Look at the Clean Air Act's VOC Emissions Reduction Program in Nonattainment Areas*, 18 *VA. ENVTL. L.J.* 41, 42 (1999).

59. The chief method of enforcing statutory requirements when EPA and the states are unwilling to adhere to the statute is citizens suits. See 42 U.S.C. § 7604. For a suggestion that citizen suits may not be an effective way to accomplish this objective, at least in some circumstances, see McGarity, *supra* note 58, at 97-98.

practice is quite a different regulatory program than one would gather from a review of the statute alone.

A. *Experience Under the 1977 Amendments*

The problems dogging effective implementation of the NAAQS are complex. In the 1977 amendments to the Clean Air Act, Congress first directly addressed the problem of nonattainment and developed specific programs designed to induce the states to make “reasonable further progress” toward attainment. The chief mechanisms for this purpose were provisions permitting EPA to extend the attainment date for such areas by as much as ten years and mandates for revisions to state implementation plans, including requirements to adopt and implement certain control measures.⁶⁰ To provide incentives for states to make the appropriate SIP revisions, EPA was authorized to cut off federal funds for highway construction in the event states failed to submit the SIPs. Additionally, in areas that failed to meet their new attainment dates, new major sources and modifications to existing major sources were banned. Finally, as with the 1970 Act, EPA was authorized to implement a control program of its own design (a federal implementation plan, or “FIP”) in states where SIPs were not forthcoming or were inadequate.

Nonetheless, the program requirements for nonattainment areas proved extraordinarily difficult to implement. Many states did not submit adequate SIPs and many failed to attain the ozone NAAQS by 1987.⁶¹ EPA was reluctant to impose sanctions on these areas, and when it proposed to do so, Congress twice came to the rescue and extended the areas’ attainment dates and/or prohibited EPA from going forward with sanctions.⁶² The clear message to the states was that the federal government was not really serious about forcing the states to implement programs that they otherwise would not willingly accept.⁶³

The states’ failure to develop adequate SIPs in response to the 1977 amendments and the continuing problems of nonattainment have been addressed in a few studies.⁶⁴ Some of the factors identified as contributing to

60. See Pub. L. No. 95-95, § 129, 91 Stat. 685, 746-51 (1977).

61. See Howard Latin, *Regulatory Failure, Administrative Incentives, and the New Clean Air Act*, 21 ENVTL. L. 1647, 1689 (1991) (“Many states produced ‘cheater SIPs’ they never expected to implement.”).

62. Office of Technology Assessment, *Urban Ozone and the Clean Air Act: Problems and Proposals for Change* 119-20 (1988) [hereinafter cited as OTA Report].

63. Pub. L. No. 100-202, 101 Stat. 1329 (1987). For a discussion of the implementation of the 1977 amendments, see McGarity, *supra* note 58, at 46-50.

64. See, e.g., *id.* at 46-50; Howard Latin, *Regulatory Failure, Administrative Incentives, and the New Clean Air Act*, 21 ENVTL. L. 1647, 1688-95 (1991); Craig N. Oren, *The Clean Air Act Amendments of 1990 A Bridge to the Future?*, 21 ENVTL. L. 1817, 1834-35 (1991); OTA Report,

these problems include: incomplete and inaccurate information about pollutant emissions levels leading to underestimates of the reductions in emissions needed to attain the NAAQS; “gaming” behavior by state regulators who manipulated atmospheric models in developing SIPs to show attainment within the applicable time frame with the least stringent controls; inadequate funding and expertise among state agencies; failures by states to implement or enforce SIP requirements; EPA delays in issuing critical rules and guidance documents; political resistance to necessary controls by state legislators; interstate transport of pollutants; and unreasonable deadlines.⁶⁵ As Professor Latin reports, EPA itself admitted that the agency was “reluctant to formally reject [state submissions], but rather [tried] to work with their colleagues in the processing chain by phone calls and protracted negotiation.”⁶⁶

In addition to these problems, one clear conclusion emerges: Notwithstanding the NAAQS and provisions for sanctions on recalcitrant states, the 1977 amendments simply were not implemented in a way that would force states to severely limit or reduce what the states perceived to be a desirable level of economic activity for the sake of air quality improvements.⁶⁷ In a study by the General Accounting Office, investigators concluded that state and local officials displayed “a general reluctance to implement control measures that will have a negative impact on economic development or change life-styles.”⁶⁸ Importantly, as suggested above, this reluctance was not countered by aggressive federal oversight:

[S]tate officials, who had never been inclined to press local industries and commuters, detected a subtle and sometimes explicit message that few consequences would attend the failure to meet their SIP obligations, despite the clear language of the statute. They also correctly perceived that the probability the EPA would write its own FIP for the states was vanishingly small. States simply had no incentive to implement effective emissions control programs

supra note 62, at 122-28; U.S. General Accounting Office, *Air Pollution: Ozone Nonattainment Requires Long-Term Solutions to Solve Complex Problems*, Report No. GAO/RCED-88-40 (1988) [hereinafter cited as GAO Report]; William Pedersen, *Why the Clean Air Act Works Badly*, 129 U. PA. L. REV. 1059 (1981).

65. See OTA Report, supra note 62, at 122-28.

66. Latin, supra note 61, at 1691 (quoting EPA, State Implementation Plan Processing Reform, 54 Fed. Reg. 2214, 2217 (1989)).

67. See *id.* at 1657-58 (describing EPA’s unwillingness to require SIPs that would impose economic hardship). Latin proposes as one “law of administrative behavior” the maxim that “agencies avoid making regulatory decisions that would create severe social or economic dislocation.” *Id.* at 1656.

68. GAO Report, supra note 64 at 27 (quoted in OTA Report, supra note 62, at 128).

over the determined opposition of local companies and local automobile drivers.⁶⁹

Lacking incentives to comply with the apparent rigidity of the CAA, “regulation in practice [was] more like an extended and generally acrimonious negotiation involving EPA, the states, various industries, and Congress, with the courts often serving as the referee.”⁷⁰

B. Experience Under the 1990 Amendments

In light of this experience under the 1977 amendments, an important question is whether the 1990 amendments have altered the respective bargaining positions of state and federal authorities in ways that yield greater state investment in attaining the ozone NAAQS than would otherwise be warranted in light of local preferences. The primary way in which the federal hand could be strengthened is to raise the costs for states that fail to meet federal standards through sanctions or other mechanisms. In the theoretical literature, the assumption appears to be that the costs to states of noncompliance with the NAAQS are currently very high, virtually precluding the states from deliberately choosing to settle for ambient air quality of lesser quality than that demanded by federal law. Were it otherwise, the argument that the CAA places too much control in the federal government and mandates unwanted levels of environmental quality (and its attendant costs) on otherwise unwilling citizens, loses much of its practical force. That is, if states can, without incurring significant costs, successfully negotiate with federal authorities a strategy of attaining air quality that is somewhat less protective of public health than the ozone NAAQS, the argument for devolution of formal authority to the states would have to be based on something other than the claim that federal law fails to account for variation in conditions among the different regions of the nation.

Experience to date under the 1990 amendments suggests that, as in the past, states are not likely to face very high costs for failing to meet federal mandates. Accordingly, a realistic appraisal of the CAA’s functioning does not necessarily lead to the conclusion that its formal insistence on attainment of nationally uniform standards is utterly insensitive to variations in local preferences.

In the 1990 Amendments, Congress did attempt to address some of the problems under the 1977 amendments by imposing what Congress perceived

69. McGarity, *supra* note 58, at 49. McGarity also surveys additional reasons why the 1977 amendments failed to achieve widespread attainment of the ozone NAAQS. *Id.* at 48-50.

70. George Eads, *The Confusion of Goals and Instruments: The Explicit Consideration of Cost in Setting National Ambient Air Quality Standards*, in FOUNDATIONS OF ENVIRONMENTAL LAW AND POLICY 259, 262 (Richard L. Revesz ed., 1997).

to be more realistic attainment dates and control programs. The obligations of states containing ozone nonattainment areas were spelled out in extraordinary detail in the statute. While attainment dates were extended, Congress “added short-term deadlines for many intermediate steps, including SIP submissions.”⁷¹ These intermediate steps include innovative mechanisms designed to provide incentives against noncompliance and to ensure that control measures yield the ozone reduction benefits they are supposed to.

First, Congress demanded that states “submit a comprehensive, accurate, current inventory of actual emissions from all sources,” and to update such inventories every three years until the ozone NAAQS is attained.⁷² The hope was that such inventories would correct the problem of unrealistic assessments of extant emissions and the amount of reductions needed to attain the NAAQS—a problem that was widely perceived as one of the more significant failings under prior law.⁷³

Second, for all but “marginal” nonattainment areas, Congress supplemented the 1997 amendments’ vague requirement that states revise their SIPs to demonstrate “reasonable further progress” toward attainment of the ozone NAAQS with specific emission reduction targets. All areas save for marginal areas were required to implement rate of progress plans that included sufficient control measures to reduce emissions of volatile organic compounds (VOCs)—a primary ozone precursor—from 1990 baseline levels by 15% by no later than 1996.⁷⁴ Serious, severe, and extreme nonattainment areas were additionally required to reduce VOC emissions by 3% annually after 1996 until the NAAQS was attained.⁷⁵ The Amendments also include a variety of additional control measures that states must adopt, including for example, vehicle inspection and maintenance programs, gasoline vapor recovery systems, and improved measures for assuring that major stationary sources were employing reasonably available control technologies.⁷⁶ The control measures become incrementally more stringent as the applicable classification

71. *Natural Resources Defense Council v. Browner*, 57 F.3d 1122, 1123 (D.C. Cir. 1995).

72. 42 U.S.C. §§ 7511a(a)(1), (3).

73. *See* OTA Report, *supra* note 62, at 123-25.

74. 42 U.S.C. § 7511a(b)(1)(A). Under certain circumstances, reductions of less than 15 percent are permitted. *See id.* § 7511a(b)(1)(A)(ii). A similar percentage reduction is required for emissions of nitrogen oxides. *See id.* § 7511a(f).

75. 42 U.S.C. § 7511a(c)(1)(B). Annual reductions of less than three percent are authorized if the state “demonstrates to the satisfaction of [EPA] that the plan reflecting such lesser amount includes all measures that can feasibly be implemented in the area, in light of technological achievability.” *Id.* § 7511a(c)(1)(B)(ii).

76. *See* 42 U.S.C. §§ 7511a(b)(2) (reasonably available control technologies), §7511(b)(3) (gas vapor recovery), §7511(b)(4) (vehicle inspection and maintenance).

increases.⁷⁷ The 1990 amendments mandated “automatic” sanctions in the event states failed to submit SIPs or to rectify SIPs that EPA had disapproved.⁷⁸

To assure that the plans for emissions reductions actually have the desired effect, and hold the states accountable for any shortfalls, Congress introduced a “milestones” program. Areas (except marginal and moderate areas) that are subject to emissions reduction targets are required to determine at three-year intervals whether the reductions have, in fact, occurred, and to submit to EPA a demonstration to that effect.⁷⁹ The milestones program is premised on the axiom that “what gets counted, gets done,” and attempts to put in place a set of clear obligations and provisions to ensure accountability.⁸⁰ If a state fails to submit a compliance demonstration or if emissions reductions fail to meet the target, the affected State must elect to have the area reclassified to the next higher classification (which subjects the area to additional control requirements), implement control measures selected by EPA and determined by EPA to be adequate to achieve the next milestone, or adopt an economic incentive program.⁸¹ If the state fails to make such an election, the area is reclassified, or “bumped up,” “by operation of law.”⁸² “The hope was that the milestone process would enable EPA and the states to isolate areas that were not progressing swiftly enough toward the statutory goals and to remedy the implementation problems in those areas.”⁸³

Congress also made provision for areas that failed to attain the ozone NAAQS by the applicable deadline. Rather than investing EPA with discretionary authority to establish for these areas a new attainment date and “reasonable further progress” requirements for SIPs,⁸⁴ Congress included automatic mechanisms. The Act directs EPA to determine within six months following an area’s attainment date whether the area attained the NAAQS.⁸⁵ Except for areas classified as “severe” or “extreme,” a determination of

77. Compare 42 U.S.C. § 7511a(a) (marginal area requirements), with *id.* §7511a(c) (serious area requirements).

78. See *Virginia v. United States*, 74 F.3d 517, 520-21 (4th Cir. 1996) (discussing sanctions); *NRDC*, 57 F.3d at 1123-24 (same).

79. 42 U.S.C. § 7511a(g).

80. See McGarity, *supra* note 58, at 43, 53-54, 99. For a discussion and endorsement of a system of regulation incorporating “milestones,” see National Academy of Public Administration, *The Environmental Protection System in Transition Toward a More Desirable Future, Final Report of the Enterprise for the Environment*, 12-18 (1996).

81. 42 U.S.C. § 7511a(g)(3).

82. *Id.*

83. McGarity, *supra* note 58, at 43.

84. Compare 42 U.S.C. § 7509(d) (general provision detailing consequences of failure to attain).

85. 42 U.S.C. § 7511(b)(2)(A).

nonattainment has the consequence that the nonattaining area is reclassified, or “bumped up” to a higher classification “by operation of law.”⁸⁶ Reclassification has the effect of establishing a new attainment date (*i.e.*, the attainment applicable to the higher classification) and imposing specific, additional SIP revision obligations on the affected state (*i.e.*, the control requirements applicable to the higher classification).⁸⁷ For severe and extreme areas, the statute specifies in detail the sanctions and additional SIP obligations that apply in the event of failure to attain by the statutory deadline.⁸⁸

Experience to date suggests that the innovative mechanisms of the 1990 amendments have either not been implemented or have not been effective in ensuring that the states make genuine progress toward attainment. Important components of the milestones program have essentially been abandoned by EPA.⁸⁹ Writing in 1999, Professor McGarity noted:

[T]he milestone program failed because the states were once again not held accountable for empty promises and overly optimistic projections in their rate-of-progress SIPs. . . . Congress went to great lengths to provide an accountability vehicle in the 1990 amendments by requiring states to demonstrate after-the-fact that the milestones had been achieved and by meticulously specifying the consequences of state failure to make adequate rate-of-progress demonstrations. The EPA, no doubt in tacit collusion with the states, completely undermined this arrangement by failing to promulgate regulations specifying how states should go about making such demonstrations and by adopting the position that no such demonstrations were required until the EPA promulgated such regulations.⁹⁰

Widespread failure on the part of states to submit SIPs within the time frames mandated by the 1990 amendments, like the failure to comply with the milestones program, has not been met with the “automatic” consequences Congress intended to put in place. Under the 1990 amendments, there are several events that serve to trigger the possibility of sanctions.⁹¹ These triggers start a “sanctions clock,” which gives the offending state eighteen months to correct the deficiency or face “mandatory” sanctions.⁹² A restrictive interpretation of how the sanctions clock operates has taken much of the sting

86. *Id.*

87. 42 U.S.C. § 7511a(i); *see also* State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 13498, 13506 (April 18, 1992).

88. 42 U.S.C. § 7511(b)(4).

89. McGarity, *supra* note 58, at 84-89.

90. *Id.* at 97.

91. *See* 42 U.S.C. § 179 (a). The statutory triggers are: (1) an EPA finding that a state has failed to submit a required SIP; (2) an EPA disapproval of a submitted SIP; (3) an EPA finding that an approved SIP is not being implemented. *Id.*

92. *See Natural Resources Defense Council*, 57 F.3d at 1123-24.

of sanctions out of the implementation of the 1990 amendments.⁹³ But EPA has been extraordinarily reluctant to take the actions that would even trigger the possibility of sanctions.

A “real-life” example illustrates this reluctance. Under the 1990 amendments, “moderate” ozone nonattainment areas were required to submit a rate of progress plan providing for specified reductions of VOC emissions.⁹⁴ The deadline for making this submission was November 15, 1993.⁹⁵ The state of Missouri submitted its first rate of progress plan for the St. Louis ozone nonattainment area in November 1993, but in January 1994, EPA found that the SIP was incomplete, triggering the sanctions clock.⁹⁶ Missouri submitted another rate of progress SIP in January 1995, supplemented by submissions in March and July of 1995; EPA managed to find the submission “complete,” stopping the sanctions clock, just one day prior to the date on which the mandatory sanctions were to be put in place.⁹⁷ In March 1996, EPA proposed a “limited approval and limited disapproval” of the state’s rate of progress plan. The primary reason for disapproving the plan was that the state’s plan relied heavily on an enhanced vehicle inspection and maintenance program to achieve the required emissions reductions, but in 1995, the Missouri legislature had deleted funding for the program from the state’s budget.⁹⁸

The proposed “limited disapproval” of the state’s rate of progress plan was never finalized by EPA, and thus, the sanctions clock was never restarted, even though it was clear that the plan could never be approved until, at the very least, the legislature acted to restore funding for the inspection/maintenance

93. *See id.* at 1125. EPA interpreted the Act to permit a state that has failed to submit a required SIP or failed to submit a complete SIP to halt the sanctions clock by submitting a “complete” SIP, even if the complete SIP is clearly inadequate to meet statutory requirements and will be disapproved by EPA. Thus, a state seeking the maximum period of time to comply with a requirement to submit a particular type of SIP revision could first fail to submit anything by the statutory deadline. If EPA were vigilant, six months later the agency would make a finding that the state failed to submit the required SIP revision, which would trigger the sanctions clock. Eighteen months later, the state could halt the sanctions clock by submitting a “complete,” but substantively deficient SIP. A vigilant EPA would then have twelve months to approve or disapprove the SIP. If EPA disapproves the SIP, a new sanctions clock begins to run and the state has another eighteen months to correct the deficiency. Thus, assuming EPA observes all the deadlines governing action on SIPs that the statute places on the agency—an assumption that runs counters to empirical reality—a state could effectively stall its obligation to submit an approvable SIP for a period of four and one-half years. The D.C. Circuit sustained EPA’s interpretation of the statute. *See id.* at 1125-29.

94. 42 U.S.C. § 7511a(b)(1)(A).

95. *Id.*

96. *See* EPA, Approval and Promulgation of Implementation Plans; State of Missouri, 61 Fed. Reg. 10968, 10970 (Mar. 18, 1996).

97. *Id.*

98. *See id.*

program. The emissions reductions associated with the rate of progress plan were by statute required to be achieved by no later than November 1996.⁹⁹ As a moderate ozone nonattainment area, the St. Louis area's statutory attainment deadline was November 15, 1996.¹⁰⁰ But it was not until November 1999 that the state of Missouri submitted a revised rate of progress plan,¹⁰¹ which was approved by EPA in May 2000.¹⁰²

The experience of the St. Louis area with the (virtually non-existent) possibility of sanctions is apparently not an isolated experience. A 1997 Congressional Research Service report identified only one area of the country that was then subject to EPA-imposed sanctions—a small area in East Helena, Montana.¹⁰³

EPA has similarly resisted the “automatic” consequences associated with areas' failure to attain the ozone NAAQS by the applicable attainment date. Of the 90 ozone nonattainment areas originally classified as either a marginal, moderate, or serious, forty-five have been re-designated to attainment and are considered ozone maintenance areas.¹⁰⁴ Of the remaining forty-five ozone nonattainment areas whose attainment deadlines have now passed—the attainment date for highest category considered here, “serious areas,” was November 15, 1999¹⁰⁵—only four have been reclassified, or “bumped up.”¹⁰⁶

99. 42 U.S.C. § 7511a(b)(1)(A).

100. 42 U.S.C. § 7511(a)(1) (table of attainment dates).

101. See 65 Fed. Reg. 8083, 8084 (Feb. 17, 2000).

102. *Id.* The revised plan itself does not mandate a 15 percent reduction of VOCs from 1990 baseline levels, because it fails to account for any growth in emissions in the nonattainment area between 1996 and the date on which all the control measures in the plan will be implemented. EPA's approval of the plan was challenged on this basis, but the Eighth Circuit concluded that EPA's conclusion that the statute merely required an accounting for growth up to 1996 was entitled to *Chevron* deference. *Sierra Club v. EPA*, No. 00-2744, slip op. at 8 (8th Cir., June 6, 2001).

103. See Congressional Research Service, Highway Fund Sanctions for Clean Air Act Violations, Report No. 97-959 ENR, available at <http://www.cnie.org/nle/trans-9html> (last visited Mar. 1, 2001).

104. The numbers presented in the text were generated by analyzing information reported in EPA's “Green Book.” See, e.g., at <http://www.epa.gov/oar/oaqps/greenbk/oinex.html> (last visited Mar. 1, 2001).

105. See 42 U.S.C. § 181(a) (Table of attainment deadlines).

106. See 63 Fed. Reg. 8128 (Feb. 18, 1998) (Dallas-Fort Worth reclassified from moderate to serious); 62 Fed. Reg. 65025 (Dec. 10, 1997) (Santa Barbara reclassified from moderate to serious); 62 Fed. Reg. 60001 (Nov. 6, 1997) (Phoenix reclassified from moderate to serious); 59 Fed. Reg. 50848 (Oct. 06, 1994) (Poughkeepsie reclassified from marginal to moderate). See also EPA, Green Book, *Federal Register Notices Related to Ozone Designations and Classifications*, at <http://www.epa.gov/oar/oaqps/greenbk/ofnrptl.html> (last visited Mar. 1, 2001). EPA has also proposed rules that reclassify the Louisville and Beaumont-Port Arthur ozone nonattainment areas, both of which were originally classified as moderate areas. See 64 Fed. Reg. 27734 (May 21, 1999) (Louisville); 64 Fed. Reg. 18864 (Apr. 16, 1999) (Beaumont-

For the remaining areas, it appears that the statutory requirement that EPA determine whether attainment was reached within six months of the applicable attainment date, with reclassification “by operation of law” for those areas that failed to attain,¹⁰⁷ has simply been forgotten, ignored, or otherwise avoided.

Within this large group of areas that EPA has not reclassified or redesignated as attainment areas, several may be affected by an EPA policy that grants extensions of statutory attainment dates if an area can show that its ability to attain the ozone NAAQS was impaired by ozone transport—the movement of ozone or ozone precursors from sources in an “upwind area” into another “downwind area”). For a few areas that may qualify for this sort of non-statutory extension, EPA has prevented areas from being “reclassified by operation of law” by deferring action relating to determinations of whether the areas attained the NAAQS by their previously applicable attainment dates.¹⁰⁸

Aside from their questionable legality,¹⁰⁹ EPA’s practices of apparently just ignoring the requirement to determine whether areas attained and of liberally granting extensions on the basis of ozone transport, has undermined Congress’s efforts to introduce accountability and to create incentives for state compliance. In its initial iterations, the ozone transport extension policy placed several important restrictions on its availability. In addition to making a demonstration that the area was affected by ozone transport, the sources of transport had to be located in an ozone nonattainment area with an attainment

Port Arthur). The St. Louis ozone nonattainment area has been bumped up, but EPA has proposed to stay the effective date of this action in order to permit the agency to consider whether the area is entitled to an extension of its 1996 attainment date. The agency proposes to withdraw the reclassification if an extension is deemed appropriate. See 66 Fed. Reg. 15591 (Mar. 19, 2001). Similar proposals have been made for the Louisville and Beaumont-Port Arthur nonattainment areas, although for these areas EPA has not yet issued a final rule.

107. 42 U.S.C. § 7511(b)(2)(A).

108. EPA has proposed to extend attainment deadlines for the following areas under its ozone transport policy: Beaumont-Port Arthur, Texas, see 64 Fed. Reg. 18864 (Apr. 16, 1999); Louisville, Kentucky, see 64 Fed. Reg. 27734 (May 21, 1999); St. Louis, Missouri, see 64 Fed. Reg. 13384 (March 18, 1999); Springfield, Massachusetts, 66 Fed. Reg. 666 (Jan. 3, 2001); Washington, D.C., 66 Fed. Reg. 586 (Jan. 3, 2001); and Greater Connecticut, 66 Fed. Reg. 634 (Jan. 3, 2001). The Washington, Springfield, and Connecticut extensions are being challenged in the D.C. Circuit. See *Sierra Club v. EPA*, No. 01-1070 (D.C. Cir.). In January 2001, a federal district court ordered EPA to finalize its rulemaking concerning whether the St. Louis area attained the ozone standard by 1996. *Sierra Club v. Whitman*, No. 98-2733 (CKK), Memorandum Opinion and Order D.D.C. Jan. 28, 2001). EPA’s response to the court order is found in two rulemakings. See 66 Fed. Reg. 15578 (Mar. 19, 2001); 66 Fed. Reg. 15591 (Mar. 19, 2001). In the interest of full disclosure, the author represents the plaintiffs in ongoing litigation against EPA concerning the St. Louis area.

109. The statute does not authorize extensions for reasons of ozone transport. The statute permits extensions under very limited circumstances, and only for a maximum of two years. See 42 U.S.C. § 7511(a)(5).

date that extended beyond the attainment date of the affected, downwind area.¹¹⁰ The apparent rationale for this limitation was that the upwind state was entitled to take advantage of the full length of its applicable attainment period and should not be forced prematurely to implement control measures not otherwise specifically required under the milestones program.¹¹¹ Presumably, and in contrast, a downwind area with the same (or longer) attainment period than the upwind area could properly insist that the upwind state implement controls to mitigate ozone transport sufficiently to permit both areas to meet their attainment deadlines.

A second important restriction on an area's ability to secure an extension due to ozone transport was that the area had to demonstrate that all the requirements associated with the area's classification had been adopted and implemented.¹¹² Thus, while the extension relieved the area of its responsibilities to demonstrate attainment through local control measures alone and to attain the NAAQS by the applicable statutory deadline, it did not relieve the affected state of its responsibility to adopt and implement the control measures specified for its applicable classification.

These limitations have now been largely abandoned, apparently due to EPA's decision to implement a regional solution to ozone transport in the form of a massive "SIP call,"¹¹³ which requires several states to reduce emissions of ozone precursors that contribute to nonattainment in other states.¹¹⁴ Of the

110. See Memorandum from Mary D. Nichols to Regional EPA Offices, Ozone Nonattainment Dates for Areas Affected by Overwhelming Transport, attachment, at 1 (Aug. 30, 1994), available at <http://www.epa.gov/ttn/oarpg/tlpgm.html> (last visited Mar. 1, 2001) ("The attainment date may not be extended beyond the attainment date for the responsible upwind area.").

111. See *id.*, attachment, at 6 (arguing that Congress did not intend for an upwind area's "obligation to prevent contribution to other nonattainment areas to supersede the practicable attainment deadline and graduated control scheme").

112. *Id.*, attachment, at 2.

113. See Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 Fed. Reg. 57356 (1998).

114. See *Extension of Attainment Dates for Downwind Transport Areas*, 64 Fed. Reg. 14441, 14443 (Mar. 25, 1999) (no longer requiring that upwind area in another state have later attainment date and not requiring area seeking extension to implement otherwise applicable requirements until "no later than the date by which the upwind reductions needed for attainment will be achieved"). Under this approach, for example, a moderate area would not need to implement the control measures in its rate of progress plan, as required by 42 U.S.C. § 7511a(b)(1)(A), until years past the statutory requirement that such measures be implemented and the emissions reductions achieved "within 6 years after November 15, 1990." *Id.* In effect, EPA's extension policy grants areas extensions not only of their attainment dates but also of their obligations to demonstrate progress toward attainment by achieving the specific emissions reductions spelled out in the statute.

areas for which EPA has proposed or granted an extension due to ozone transport, none had fully implemented the applicable rate of progress control requirements prior to the area's statutory attainment date.¹¹⁵ None was affected by ozone transport from an area with a higher classification; indeed, some were affected by ozone transport from areas with lower classifications.

EPA's explanation for abandoning the statutory deadlines governing implementation of rate of progress control measures is somewhat astonishing. The agency concluded that "requiring all local reductions to be implemented prior to the time that upwind reductions are achieved would not accelerate attainment," and for that reason, need not be implemented prior to the upwind reductions.¹¹⁶ When one commenter suggested that the control measures would provide public health benefits prior to attainment, EPA responded that none of the areas granted extensions "have delayed or postponed the effectiveness of measures because their attainment date is being extended."¹¹⁷ The idea seems to be that the only measure of a control measure's effectiveness is its ability to yield "attainment." But this stands the rate of progress plans and milestone requirements on their head. The point of these control measures is to make *progress toward attainment* and to reduce peak ozone concentrations as expeditiously as possible, even if the reductions are not enough to reach attainment.

C. *Slippage and the Critique of Uniform Federal Air Quality Standards*

In light of the experience with the NAAQS under both the 1977 and 1998 amendments, criticisms of the NAAQS on the basis of their "uniformity" and, to a lesser extent, their stringency fail to join theory with practice. My brief review of the manner in which the Clean Air Act has been implemented confirms Professor Farber's conclusion that, "often, the supposed uniform standards are both incomplete and under-enforced, with much state variation the inevitable result."¹¹⁸ Indeed, the extent of slippage between statutory requirements and actual state obligations is so extensive and continuing that it is virtually meaningless to speak of the efficiency losses associated with the implementation of uniform standards. Moreover, the extent of slippage seems to be more or less tailored to the particular circumstances of particular states and localities, as with the extension policy for areas affected by ozone transport. Accordingly, it is difficult to assess to what extent federal standards have forced states to make improvements in environmental quality that they

115. See sources cited *supra* note 108.

116. 66 Fed. Reg. at 676.

117. *Id.* at 677 (Springfield extensions rulemaking); see 66 Fed. Reg. at 599 (Washington, D.C., extension rulemaking); 66 Fed. Reg. at 645 (Connecticut extension rulemaking).

118. Farber, *supra* note 20, at 317.

would not otherwise independently pursue. It is certain, however, that the inefficiencies supposedly inflicted by the NAAQSs are not by virtue of their uniformity, which is typically the only, or most significant, basis for criticism invoked by scholars inspired by economism.

II. WHY FEDERAL AIR QUALITY STANDARDS?

Because federal air quality standards are uniform neither in form nor practice, much of the economics-inspired criticism of the NAAQS is a bit of a sport, at least to the extent that it is based on the simple assertion that federal air quality standards utterly disregard variations in the respective costs of pollution and pollution control throughout the nation. Nonetheless, it is hardly satisfying to justify the NAAQS generally, and the ozone NAAQS in particular, on the ground that they accomplish or approach a desired result through indirection. Indeed, to this point, it has been assumed implicitly (or at least not disputed) that critics of federal regulation are right in asserting that the normatively appropriate unit for analysis is the state: The structure of aggregated citizens' preferences within the respective states, not the nation as a whole, should determine appropriate levels of environmental quality. If this assumption is deemed appropriate, then it makes little sense to defend federal standards on the ground that they do not depart significantly from the choices the citizens of the respective states would otherwise make for themselves.

Nonetheless, federal standards may be justified along two general lines of argument. First, assuming that the states are presumptively appropriate jurisdictions for regulating environmental quality, a number of factors may frustrate state efforts to establish and enforce regulatory choices that reflect the preferences of state residents. Second, the assumption that environmental quality is a "local" good, rather than a "national" good can be challenged on various grounds. In this section I examine these two, independent forms of justification for federal air quality standards. I conclude that treating air quality as a national good, subject to federal minimum standards is a normatively more attractive approach than treating air quality as merely a "local" good.

A. *Obstacles to Effective Environmental Regulation By States May Justify Federal Standards*

Consistent with the assumption that states are the preferred jurisdictional unit for purposes of environmental policy, federal standards may nonetheless be warranted on economic grounds. There are four widely recognized problems that may prevent states from establishing and enforcing environmental standards that mirror the aggregated preferences of their citizens. These problems are: (1) environmental conditions that do not match

up with any particular state's geographic jurisdiction; (2) scientific and technical issues; (3) race-to-the-bottom dynamics; and (4) public choice problems.

1. Environmental Conditions That May Frustrate State Environmental Standards: Interstate Externalities

In proposing greater reliance on states, critics of federal regulation often link the normatively desirable, or "optimal" jurisdiction for regulation to the geographical scope of environmental problems. On this view, if economic activity within a particular state affects environmental conditions only in that state, the appropriate jurisdictional unit should be the state, not the federal government.¹¹⁹ Professors Butler and Macey have dubbed this approach the "Matching Principle":

The Matching Principle suggests that, in general, the size of the geographic area affected by a specific pollution source should determine the appropriate governmental level for responding to the pollution. There is no need for the regulating jurisdiction to be larger than the regulated activity. In other words, when a particular polluting activity is limited to a particular locality or state, there is very little justification for federal environmental regulation.¹²⁰

The operative assumption of those who advocate less federal environmental regulation and greater reliance on states is that the geographic reach of most environmental problems more closely matches the geographic jurisdiction of states than that of the federal government. This assumption is often just asserted with no supporting empirical data or developed argument. Almost all critics of federal environmental regulation acknowledge, however, that when pollution crosses state boundaries, state regulation of resident pollution sources will not likely yield desired levels of environmental quality,

119. See, e.g., Thomas S. Ulen, *Economic and Public-Choice Forces in Federalism*, 6 GEO. MASON L. REV. 921, 926-29 (1998); William W. Bratton & Joseph A. McCahery, *The New Economics of Jurisdictional Competition: Devolutionary Federalism in a Second-Best World*, 86 Geo. L.J. 201, 231-32 (1997) ("In a theoretical first-best regime, the impact of all costs and benefits of public goods production must be restricted to the providing jurisdiction."). See generally JAMES M. BUCHANAN & GORDON TULLOCK, *THE CALCULUS OF CONSENT: LOGICAL FOUNDATIONS OF CONSTITUTIONAL GOVERNMENT* 113-16 (1965).

120. Butler & Macey, *supra* note 12, at 25; see also Esty, *supra* note 17, at 587 (describing as a "structural mismatch" a situation in which "the scope of an environmental harm does not match the regulator's jurisdiction"); Zerbe, *supra* note 16, at 204:

The question of the geographical extent of pollution damage is central to the question of appropriate jurisdictions for environmental control. The more geographically widespread the damages, the less satisfactory local control would be.

at least in states affected by pollution from other states. Accordingly, federal regulation may be desirable.¹²¹

In the presence of interstate pollution externalities, federal regulation is necessary to arbitrate disputes among the states about how shared environmental resources—e.g., airsheds and waters—are to be used. Absent such regulation, “upwind” (or upstream) states will ignore pollution sent from their state to “downwind” (or downstream) states because the upwind state bears none of the costs of this pollution and controlling it would reduce the benefits the upwind state enjoys from the economic activity that generates the pollution.”¹²² Likewise, in the absence of federal regulation, regulators in states affected by pollution sent from other states are powerless to control out-of-state polluters and will thus be unable to maintain desired levels of environmental quality or can do so only by imposing excessive burdens on local economic activity.¹²³ Accordingly, regulatory decisions may be skewed in favor of more pollution than would be warranted in the absence of interstate pollution.

In considering the problem of externalities, the matching principle presents several puzzles in application. Most importantly, the reach of environmental problems cannot be determined simply by tracing the physical footprint of economic activity. One obvious problem in this respect is that the federal government manages as national goods many thousands of acres of land located in the states, often because of the desirable environments these lands contain. Economic activity within a state that spills pollution into federally managed areas represents another, often significant form of inter-jurisdictional externality.¹²⁴ Conversely, many federal facilities are themselves significant sources of pollution, often imposing negative externalities on nearby state residents.¹²⁵ On federal lands and federal facilities, no serious claim to

121. See Stewart, *Pyramids of Sacrifice*, *supra* note 17, at 1215-16, 1226-27 (discussing interstate pollution “spillovers”).

122. See Revesz, *Interstate Externalities*, *supra* note 17, at 2343 (an interstate externality arises “because a state that sends pollution to another state obtains the labor and fiscal benefits of the economic activity that generates the pollution but does not suffer the full costs of the activity,” with the consequence that “an undesirably large amount of pollution will cross state lines”).

123. See Thomas W. Merrill, *Golden Rules for Transboundary Pollution*, 46 DUKE L.J. 931, 932 (1997).

124. For example, the Clean Air Act includes special provisions for protecting visibility and “air quality related values” for federal lands. See 42 U.S.C. §§ 7475(d)(2) (protection for air quality related values); §§ 7491-7492 (visibility protection); see also EPA, Regional Haze Regulations, 64 Fed. Reg. 35714 (July 1, 1999) (rule to improve visibility in national parks and wilderness areas).

125. See generally First Kassen, *The Inadequacies of Congressional Attempts to Legislate Federal Facility Compliance with Environmental Requirements*, 54 MD. L. REV. 1475 (1995).

exclusive decisional authority about levels of environmental quality can be made by the residents of the state in which the federal property is located. The preferences of these residents, while certainly relevant, are entitled to no greater consideration than the preferences of all citizens of the nation.

A second circumstance in which the physical reach of environmental problems may be an inappropriate guide for selecting a regulatory jurisdiction involves circumstances where the economic effects of state decisions about environmental quality do not coincide with the decision's physical effects.¹²⁶ These economic effects may involve negative or positive interstate externalities. Even if no pollution crosses state lines, it may be appropriate to consider the preferences of citizens from other states to ensure that resources are devoted to their most highly valued uses.¹²⁷ Citizens may place significant value on environmental goods they use in areas other than their state of residence—e.g., parks, waterbodies, wilderness area, and endangered species.¹²⁸ Unless these values are considered by state regulators, states may fail to devote environmental resources to their most highly valued uses.

Where effective mechanisms exist for states to charge out-of-state residents with some of the costs of providing quality environments—e.g., entrance fees or license charges—state regulators could be expected to take “foreign” preferences into account in their regulatory decisions.¹²⁹ For some sorts of preferences, however—most controversially, nonuse values including “option” and “existence” values¹³⁰ and the preferences of future generations¹³¹—the states lack effective cost-bearing mechanisms and the relevant preferences will likely be ignored.¹³²

126. See Zerbe, *supra* note 16, at 205-05; Esty, *supra* note 17, at 593-97.

127. See Zerbe, *supra* note 16, at 205 (“[T]he local environment may have and usually will have value to nonresidents of the locality, even in the absence of interjurisdictional pollution.”).

128. See Richard L. Revesz, *The Race to the Bottom and Federal Environmental Regulation: A Response to Critics*, 82 MINN. L. REV. 535, 543 (1997) [hereinafter *Response to Critics*].

129. See Zerbe, *supra* note 16, at 206-07.

130. Option values reflect an individual's willingness-to-pay to preserve an environmental resource for future use. [cite] Existence values are the amount an individual would pay to preserve an environmental resource wholly aside from any present or future use that individual may make of the resource. A related concept is “bequest” value—the amount an individual would be willing to pay to preserve an environmental resource for the use of future generations. For discussion, see Douglas R. Williams, *Valuing Natural Environments: Compensation, Market Norms, and the Idea of Public Goods*, 27 CONN. L. REV. 365, 398-407 (1995).

131. See Swire, *supra* note 17, at 99-100.

132. Determining the geographic scope of environmental problems raises knotty problems of measurement and valuation that cannot adequately be addressed here. But a simple example will highlight the difficulty. Professors Butler and Macey argue that some non-use values based on preferences held by out-of-staters should simply be factored out in considering the question of regulatory jurisdiction. They posit a case in which Oregon residents are “deeply concerned” about lax environmental regulation of chemical plants in Louisiana. See Butler & Macey, *supra*

State regulatory decisions may also fail to yield desirable levels of environmental quality, even when there are no inter-jurisdictional externalities. Strong local preferences for environmental quality may be overridden by

note 12, at 30. Professors Butler and Macey assert that the harm to Oregonians can properly be ignored because “the local residents in Louisiana, not the Oregon environmentalists, would bear all the costs of reducing pollution.” *Id.* at 31. They imply that the harm experienced by Oregonians is not an externality at all, asserting that “[a]llocation of regulatory authority over local externalities to local governments allows decisions to be made by the representatives of citizens who benefit the most from and the pay the most for higher environmental quality.” *Id.*

There are three nagging problems with this conclusion. First, we may assume that the concerned Oregonians are willing to pay something (maybe not much) to achieve stricter regulation in Louisiana. If willingness-to-pay is the proper indicator of an economic effect, it is entirely unclear why some “harms”—such as though experienced by the Oregonians—should be deemed externalities and others not. To make judgments of this sort is to engage in interpersonal comparisons of utility, and as Professor, now-Judge Calabresi has observed, “the moment we are willing to [do] that . . . we have introduced a nonunanimously held value into the scheme, and its open season. . . . [T]here is no reason based in economics or efficiency why some such comparisons should be allowed and others excluded.” Guido Calabresi, *The Pointlessness of Pareto: Carrying Coase Further*, 100 YALE L.J. 1211, 1217 (1991).

Second, to the extent that the harm experienced by Oregonians is properly considered an “externality,” exclusion of Oregonian preferences on the ground that Oregonians bear none of the costs of protecting environmental values in Louisiana confuses allocative efficiency with distributive justice. This is a surprising claim from Professors Butler and Macey, for the question of how the costs and benefits of environmental quality are distributed is generally treated by economics-inspired scholars like Professors Butler and Macey as different from the question of how much environmental quality should be provided. On the distinction between allocative efficiency and distributive effects, see generally RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW* 12-13 (3d ed. 1986).

It may seem odd to state that the preferences of Oregonians should be weighed equally with the preferences of Louisianans by Louisiana regulators. And, indeed, it *is* an odd conclusion, for Louisiana regulators are, by definition, representatives only of residents of Louisiana. If state representatives consistently based regulatory decisions on overriding preferences of non-Louisianans, it is likely that those representatives would soon find themselves out of work, as Louisiana voters make their preferences known at the voting booth. But viewing the issue in this way already assumes away the critical normative issue—namely, determining who is entitled to share in the benefits and who may be required to bear the costs of environmental protection, and which jurisdiction is the appropriate one to regulate. If environmental quality in Louisiana is viewed as a national good, then no mismatch between those holding preferences about environmental quality in Louisiana and the regulatory jurisdiction arises.

The third problem has to do with who bears the costs of more stringent regulation. Tracing how the increased costs of stricter environmental regulation in Louisiana will be distributed is tricky. The costs might be borne entirely by the shareholders of the chemical companies facing such costs; they may be borne by the consumers of the products marketed by the affected firms; or they may be borne by the firms’ employees in the form of lower compensation. In some cases, (as with shareholders and consumers), most of the costs might be borne by citizens of states other than Louisiana.

contrary aggregate state-wide preferences. Professor Esty has described this situation as one involving “internalities”—mismatches between the regulating jurisdiction and the environmental problem that arise “[w]hen the jurisdiction is broader than the scope of the public good in question.”¹³³ He offers the example of a local population that wishes to build a park and is willing to bear the costs of doing so, but is frustrated by a jurisdiction-wide referendum that rejects the park proposal.¹³⁴ Where such internalities are present, state regulation may be subject to the same sorts of criticism that advocates of state regulation currently raise against federal regulation—namely, that it ignores variations in the costs of pollution and pollution control from locality to locality within a state.

For air quality standards, the factors discussed above may frustrate state efforts to make trade-offs between environmental quality and economic activity. Most significantly, air pollution may generate significant inter-jurisdictional externalities. Many air pollutants, such as sulfur dioxide, nitrogen oxides, and ozone and its precursors, travel long distances, contributing to environmental degradation in states other than the state of origin.¹³⁵ The 1990 Clean Air Act Amendments addressed the problem of interstate acid deposition by creating an innovative “cap and trade” program, employing marketable permits, to reduce aggregate emissions of acid-forming pollutants.¹³⁶ And EPA has finally acted to reduce interstate transport of ozone precursors through a demand for amendments to a large number of state implementation plans.¹³⁷ Some air pollution problems, such as global climate change and stratospheric ozone depletion, clearly transcend even national

133. Esty, *supra* note 17, at 588.

134. *Id.*

135. Professors Butler and Macey argue that “smog and local air pollution are local problems.” Butler & Macey, *supra* note 12, at 54. They do not, however, cite any empirical support for this assertion, which is plainly erroneous. It is now well known that smog is a regional air quality problem caused by interstate transport of pollutants. See generally OZONE TRANSPORT ASSESSMENT GROUP, FINAL REPORT, at <http://www.epa.gov/ttn/rto/otag/finalrpt/> (last visited Mar. 1, 2001).

136. 42 U.S.C. §§ 7651-7651o. See generally Paul L. Joskow & Richard Schmalensee, *The Political Economy of Market-Based Environmental Policy: The U.S. Acid Rain Program*, 41 J.L. & ECON. 37 (1998).

137. See Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 Fed. Reg. 57,356 (1998) (codified at 40 C.F.R. pts. 51, 72, 75, 96 (2000)). Information on this program and related programs can be found on the web at <http://www.epa.gov/airmarkets/progregrs/noxview.html> (last visited June 6, 2001); see also Patricia Ross McCubbin, Michigan v. EPA, *Interstate Ozone Pollution and EPA's “NO_x SIP Call,”* 20 ST. LOUIS U. PUB. L. REV. 45 (2001).

boundaries.¹³⁸ Protection of air quality in federal lands also may place significant constraints on a state's ability to choose air quality standards that permit more pollution than is currently allowed under the federal ambient standards.¹³⁹

Under these conditions, federal regulation of air quality is warranted.¹⁴⁰ Yet the form of federal regulation remains controversial. Many supporters of state regulation argue that, in circumstances where it is warranted, federal regulation should displace state preferences as little as possible.¹⁴¹ This view, however, is inconsistent with the notion that the size of the pollution problem should determine the appropriate regulatory jurisdiction. Where air resources are essentially shared among residents of two or more states, arguments for respecting divergent state preferences about the use of the resource make sense only if something other than the matching principle is at work. Indeed, where resources are shared, as Ronald Coase famously demonstrated, the problem is not one of "spillovers," but of incompatible uses.¹⁴² In such circumstances, the most difficult questions are likely not to concern appropriate levels of environmental quality—although this question will obviously remain essential—but rather, how the costs of reducing pollution are distributed to achieve a welfare maximizing result.

Consider, for example, a circumstance in which two states, A and B, share an air resource. For simplicity, assume that there are only two sources of pollution—SA, (located in state A), and SB (located in state B)—and only one pollutant—pollutant X. Assume further that both sources, if unregulated, would make the following contributions to ambient levels of X in states A and B (expressed as parts of pollution per million parts of air (ppm)):

138. See generally Framework Convention on Climate Change, 31 I.L.M. 849 (1992); Montreal Protocol on Substances that Deplete the Ozone Layer, 26 I.L.M. 1550 (1987).

139. See generally Craig Oren *The Protection of Parklands from Air Pollution: A Look at Current Policy*, 13 HARV. ENVTL. L. REV. 313 (1989).

140. Professor Revesz explains why, absent federal regulation, states would not likely be able to resolve disputes among themselves about interstate air pollution in an effective or efficient manner. See Revesz, *Interstate Externalities*, *supra* note 17, at 2375 & n.123; see also Stewart, *Pyramids of Sacrifice*, *supra* note 17, at 1216 (1977).

141. See Butler & Macey, *supra* note 12, at 36-37, 42.

142. See Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960); see also STEPHEN G. BREYER ET AL., *ADMINISTRATIVE LAW AND REGULATORY POLICY* 7 (4th ed. 1999) (noting that "Coase's suggestion, now widely accepted within economics, is that the harmful effects of pollution should not be seen as externalities " but rather as "result[ing] from a large number of acts and omissions on both sides").

SOURCE	CONTRIBUTION TO AMBIENT X POLLUTION IN STATE A	CONTRIBUTION TO AMBIENT X POLLUTION IN STATE B
S _A	7 ppm	5 ppm
S _B	8 ppm	10 ppm

Under these simplified assumptions, and absent any regulation, ambient levels of X would be 15 ppm in both states. Suppose State A has a taste for air of high quality and has chosen to set a standard for X at 8 ppm. To achieve this standard, ambient concentrations of the pollutant will have to be reduced by 7 ppm. State B cares less about air quality, favoring greater economic activity, and has selected a standard of 12 ppm. To achieve this standard, ambient concentrations must be reduced by 3 ppm. In these circumstances, by how much should each source be required to reduce its emissions of pollutant X?

Without knowing more about the costs and benefits, no determinate conclusion about a welfare-maximizing result can be reached.¹⁴³ Each state might argue that its standard is designed to permit the existing source in its jurisdiction to operate without restriction, while preserving a margin for further economic growth. State A would argue that SB should be required to reduce its contribution to ambient X in state A entirely, to protect state A's chosen margin for growth. The same argument could be made by state B with respect to SA's contribution to pollution in state B. Both might well founder under the Supreme Court's dormant commerce clause jurisprudence, which generally prohibits the states from discriminating between in-state and out-of-state industries in pursuing environmental objectives.¹⁴⁴ Importantly, however, it is the federally chosen distribution of pollution reduction requirements that will, to a considerable extent, affect the mix of environmental quality and economic activity within each state, even if the states retain responsibility for their respective ambient standards.

One possibility for resolving this problem would be the use of marketable permits, but this solution may frustrate states' efforts to achieve a desired mix

143. For suggestions on appropriate resolutions for interstate pollution, adopting a "golden rule" approach, see Merrill, *supra* note 123.

144. See, e.g., *Chemical Waste Management v. Hunt*, 504 U.S. 334 (1992) (invalidating differential fees for disposal or treatment of out-of-state and in-state hazardous waste); *Philadelphia v. New Jersey*, 437 U.S. 617 (1978) (invalidating ban on disposal of out-of-state waste). For a discussion of how dormant commerce clause principles might be invoked to resolve interstate air pollution problems, see Revesz, *Interstate Externalities*, *supra* note 17, at 2398-2409.

of environment quality and economic activity. Each state could issue permits representing the total amount of pollution it is willing to tolerate. Each permit would allow a source to make a specified contribution to the concentration of a pollutant in the ambient air. The permits then would be freely transferable among sources and each source's pollutant emissions would be restricted to the amount specified in the permits each source holds.¹⁴⁵ Under this system, most of the permits to pollute in state A could end up being held by sources in state B, frustrating state A's attempts to fine tune its environmental standards to promote a specified level of economic activity, while permitting state B to externalize some of the environmental costs of its greater economic activity.¹⁴⁶ Moreover, it may turn out that controls on sources located in state B sufficient to attain the more stringent state A standards could not be fine-tuned in ways that would permit full exploitation of state B's less stringent standards. In such a case, state A has to some extent externalized the costs of its more stringent environmental standards to state B.

Minimum federal ambient standards do not necessarily solve the problem of how to distribute the costs of pollution control among sources of interstate pollution. They do, however, minimize opportunities for states to externalize the costs of their choices regarding environmental standards. Federal standards are also consistent with the view that the jurisdiction with regulatory authority ought to be large enough to include all individuals who suffer costs or receive benefits from the activity to be regulated.

145. For a general discussion of marketable permit programs, see Robert W. Hahn & Gordon L. Hester, *Marketable Permits: Lessons for Theory and Practice*, 16 *ECOLOGY L.Q.* 361, 364-65 (1989).

146. The result stated in the text is analogous to the problem of "hot spots"—the costs of pollution are concentrated in a particular area—that can develop from a system of pollution control employing marketable permits. See generally Richard T. Drury *et al.*, *Pollution Trading and Environmental Injustice: Los Angeles' Failed Experiment in Air Quality Policy*, 9 *DUKE ENVTL. L. & POL'Y F.* 231, 251-57, 271-73 (1999) (discussing problem of "hot spots" arising from Los Angeles pollution trading program); Stephen M. Johnson, *Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice?*, 56 *WASH. & LEE L. REV.* 111, 118 (1999) (discussing how market-based mechanisms of pollution control may concentrate the costs of pollution unfairly).

2. Scientific and Technical Issues: Economies of Scale

One of the more pressing problems of environmental regulation and policy concerns the appropriate response to significant uncertainties about both the health and environmental effects of economic activity and the costs and benefits of addressing such effects. The costs of producing data about the relative health and environmental risks of various pollutants, the costs of reducing pollution, and the benefits likely to be realized from undertaking such reductions, when such data is available (and often it is not available), can be quite high. Centralizing these information gathering and disseminating functions at the national level may yield significant scale economies.¹⁴⁷

Critics of federal regulation acknowledge that scale economies may support a federal role in environmental regulation. They contend, however, that the presence of scale economies merely supports federal production and dissemination of the relevant data, not standards-setting functions.¹⁴⁸ On this view, the federal government could perform the basic data gathering and analysis, exploiting scale economies, while leaving the states free to use the data and analysis in making independent policy decisions about whether and what extent to regulate identified hazards.

This response seems sensible, and may in fact yield substantial benefits. There are, however, several significant features about environmental regulation, information assessment, and policy-making that make this sharp distinction between fact-based inquiries (information gathering and assessment) and value-based judgments (standards-setting) problematic. First, choices about which environmental hazards to investigate and assess are themselves policy choices.¹⁴⁹ To a considerable degree, then, vesting informational and technical capacities in the federal government necessitates a strong federal role in deciding what may be regulated and what may not.¹⁵⁰

Second, the processes of risk assessment and risk-benefit analysis are not normatively neutral. A variety of critical policy issues are internal to these processes, blurring the distinction between risk assessment and risk

147. See Esty, *supra* note 17, at 613-16 (discussing economies of scale in technical matters); Stewart, *Pyramids of Sacrifice*, *supra* note 17, at 1212.

148. See Revesz, *Response to Critics*, *supra* note 128, at 543-44.

149. On setting an environmental regulatory "agenda," see EPA, SCIENCE ADVISORY BOARD, REDUCING RISK: SETTING PRIORITIES AND STRATEGIES FOR ENVIRONMENTAL PROTECTION (1990); John S. Applegate, *Worst Things First: Risk, Information, and Regulatory Structure in Toxic Substances Control*, 9 YALE J. ON REG. 277 (1992).

150. Instructive in this respect is the experience of the Occupational Safety and Health Administration's regulation of toxic exposures in the workplace. See generally Sidney A. Shapiro & Thomas O. McGarity, *Reorienting OSHA: Regulatory Alternatives and Legislative Reform*, 6 YALE J. ON REG. 1 (1989).

management.¹⁵¹ Thus, the data provided to states will be the product of important policy choices. As a consequence, to truly reflect state judgments of the relative value of greater or lesser environmental protection, state standards would have to be the product of information gathering processes that are themselves normatively endorsed by the state. This, in turn, would require either more finely tuned federal assessment procedures or a decentralized approach to risk assessment and risk-benefit analysis. Either approach would defeat any economies of scale that would attend federal assessment processes.

Third, the process of setting and implementing environmental standards is itself enormously resource intensive. A typical major EPA rulemaking may involve years of study, an extended period for public participation, and a lengthy and costly process of judicial review. For example, EPA's efforts to implement a staged ban of asbestos products extended over nearly ten years and involved a 45,000-page administrative record.¹⁵² In addition, the rulemaking prompted congressional hearings and an acrimonious battle between the Office of Management and Budget and Congress. Despite the extended efforts of EPA, the asbestos ban was set aside by the Fifth Circuit, largely because the court believed that EPA had taken too many shortcuts in analyzing the hazards posed by asbestos and the ways in which the associated risks might justifiably be managed.¹⁵³ This process is repeated in most of EPA's important rulemakings, often involving remands to the agency from reviewing courts and extended and costly delays in implementation.

Reliance on state standards would significantly increase aggregate costs of implementing those standards. It can be expected that regulated parties and regulatory beneficiaries would demand (and most likely receive) extensive participation rights in state standard-setting processes, including opportunities to seek judicial review of those standards. These costs, aggregated over fifty or more jurisdictions could reach staggering levels. Federal standards, by contrast, significantly reduce these transaction costs. It is, of course, an open question whether the higher transaction costs associated with state-centered regulation would be offset by the cost savings associated with (presumably)

151. See generally Wendy Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613 (1995) (describing how "trans-scientific" issues involve mix of science and policy); Howard Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. ON REG. 89, 105 (1988) (same); see, e.g., Lester Lave, *Benefit Cost Analysis: Do the Benefits Exceed the Costs?*, in RISKS, COSTS, AND LIVES SAVED 104 (Robert Hahn ed., 1996), reproduced in BREYER, ET AL., ADMINISTRATIVE LAW AND REGULATORY POLICY: PROBLEMS, TEXT, AND CASES 181-82 (4th ed. 1999).

152. See PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 458 (3d ed. 2000).

153. *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201 (5th Cir. 1991).

more efficient standards. Nonetheless, a credible case can be made that significant economies inhere in federal standards.

3. Race-to-the Bottom Dynamics

A long-voiced justification for federal environmental standards is that they prevent states from competing with each other for economic activity by relaxing environmental standards and thereby offering lower location costs to industry. Such competition is undesirable if it prompts states to select suboptimal environmental standards to attract geographically mobile industry. Where this undesirable result obtains, competition among the states may resemble a prisoners' dilemma game, resulting in a "race-to-the-bottom."¹⁵⁴

The race-to-the-bottom rationale for federal environmental regulation has been seriously tested in recent years. Indeed, the scholarly literature has divided on the question whether regulatory competition among the states would yield a race-to-the-bottom. Professor Richard Revesz, relying primarily on a model developed by Wallace Oates and Robert Schwab,¹⁵⁵ has argued that "the race-to-the-bottom hypothesis, though influential, lacks a sound theoretical basis."¹⁵⁶ On this view, a market in which states compete by offering location rights to mobile capital should be viewed no differently than a market involving firms selling widgets; regulatory competition will tend toward an optimal mix of economic activity and environmental quality.¹⁵⁷

By contrast, a number of scholars have argued that the stringent assumptions needed to demonstrate efficiency gains from state regulatory competition render these competitive models utterly irrelevant to critical policy choices.¹⁵⁸ Others have gathered empirical evidence that is suggestive, but not conclusive of a race-to-the-bottom.¹⁵⁹ Finally, it has been shown in some

154. See Swire, *supra* note 17, at 68; Revesz, *Race-to-the-Bottom*, *supra* note 22, at 1210; Stewart, *Pyramids of Sacrifice*, *supra* note 17, at 1211-12.

155. See Wallace E. Oates & Robert M. Schwab, *Economic Competition Among Jurisdictions: Efficiency Enhancing or Distortion Inducing?*, 35 J. PUB. ECON. 333 (1988).

156. Revesz, *Race-to-the-Bottom*, *supra* note 22, at 1244.

157. *Id.* at 1234-35.

158. See, e.g., Bratton & McCahery, *supra* note 119 (surveying and criticizing the demanding assumptions of models of regulatory competition); Swire, *supra* note 17, at 94 (concluding that the assumptions needed to demonstrate that regulatory competition will yield efficient outcomes "are strongly counterfactual" and noting that "[e]nvironmental law is largely defined by the very factors that are assumed away in the models").

159. See Scott R. Saleska & Kirsten H. Engel, "Facts Are Stubborn Things": An Empirical Reality Check in the Theoretical Debate Over the Race-to-the-Bottom in State Environmental Standard-Setting, 8 CORNELL J.L. & PUB. POL'Y 55 (1998); Holly M. Hock, *Interstate Competition for Jobs and Industry Through Laxity of Environmental Regulations: Pennsylvania's Response and the Effects*, 7 DICK. J. ENVTL. L. & POL'Y 263 (1998); Kirsten H. Engel, *State*

circumstances state regulation may lead to a “race-to-the-top,”¹⁶⁰ although those circumstances are probably extremely limited.¹⁶¹

Professor Swire, for example, has noted that the problems most likely to frustrate the efficient functioning of regulatory competition—resulting in “market failure”—are those that independently support federal environmental regulation—namely, “interstate externalities, deep public choice problems, and intractable theoretical and practical obstacles to measuring the social utility of environmental regulations.”¹⁶² Professors Bratton and McCahery pose a more fundamental theoretical difficulty for regulatory competition models that promise greater efficiency. They argue that given the incentives faced by state regulators, “one cannot assume an entrepreneurial state”—i.e., that states will actually be motivated to compete in the manner specified in the regulatory competition models.¹⁶³ A more plausible model would “substitute[] an incentive picture in which market competition shares a place with the conventional political factors of interest-group influence and voter accountability.”¹⁶⁴

It may very well be that any possibility of a race-to-the-bottom could be eliminated by simply addressing the problem that creates the resulting market failure—if, with Professor Swire, we assume that such market failures provide the critical conditions under which a race-to-the-bottom develops.¹⁶⁵ Indeed, in attacking the race-to-the-bottom rationale for federal regulation, Professor Revesz insists that problems such as interstate externalities and public choice shortcomings should be kept “analytically distinct” from race-to-the-bottom problems.¹⁶⁶ Professors Bratton and McCahery have similarly argued that the “[t]he race-to-the-bottom concept should be retired because it does not provide an effective basis for challenging weak claims for competitive benefits.”¹⁶⁷ Instead, proponents of federal regulation should focus on the weakness in claims of benefits associated with regulatory competition among the states.

To some extent, Professor Revesz’s insistence on keeping race-to-the-bottom arguments analytically distinct from other problems that may plague

Environmental Standard-SETTING: Is There A “Race” and Is It “To the Bottom”?, 48 HASTINGS L.J. 271 (1997).

160. DAVID VOGEL, TRADING UP: CONSUMER AND ENVIRONMENTAL PROTECTION IN A GLOBAL ECONOMY (1995).

161. See Swire, *supra* note 17, at 80-87.

162. *Id.*

163. Bratton & McCahery, *supra* note 119, at 238.

164. *Id.* at 239.

165. See Swire, *supra* note 17, at 95 (noting that “[t]he presence of serious market failures in competition among the states undermines any claim that the competition is efficient.”).

166. Revesz, *Response to Critics*, *supra* note 128, at 546.

167. Bratton & McCahery, *supra* note 119, at 264.

state regulation “loads the dice;” if all market failures are simply assumed away, efficient outcomes are, by definition, guaranteed. The more appropriate question might be whether, in the presence of market failures like interstate externalities, federal regulation that eliminates or reduces states’ abilities to compete through environmental regulation yields greater or lesser net benefits than more targeted federal responses. Unfortunately, this question has received scant attention and is not likely to be subject to determinate resolution.

Interstate transport of ozone and ozone precursors, as noted above, is likely to frustrate efforts by states to establish optimal environmental standards, and this market failure could lead to competition among states that yields suboptimal levels of ozone. Federal efforts to correct this specific market failure, without imposing minimum federal standards, may be unsuccessful in the presence of competition for industry among affected states.

Given the absence of a consensus on the race-to-the-bottom question, one way to imagine the issues is to consider which rule—federal or state regulation—should obtain in the face of uncertainty about the welfare effects of either rule. Most proponents of state regulation, assume that since competition is presumptively welfare-enhancing, we should favor any rule that increases the opportunities for regulatory competition. On the other hand, competition is beneficial only in the absence of significant market failures and it is by no means clear that limited federal intervention, targeted to address specific sorts of market failure will successfully achieve the desired correction. Moreover, devolution to the states represents a significant departure from the status quo, and as such, might be thought to require a rather compelling justification. Indeed, federalism debates now have largely devolved into arguments about default rules, a point I address below.

4. Public Choice Issues

Another widely invoked justification for federal standards is that systematic distortions in state political processes will result in undesirably lax environmental standards. Put another way, there is widespread skepticism that state regulators will select environmental standards that undervalue environmental quality relative to the value placed on environmental quality by state residents.

The chief reasons that states are more likely than the federal government to undervalue environmental quality have to do with the differing political dynamics as between the states and the federal government. It is frequently noted that, under standard public choice models, one would expect very little environmental regulation because the costs of such regulation are generally

very concentrated while the benefits are diffuse.¹⁶⁸ Thus, the standard public choice story is that industry, which generally bears the highest costs of environmental regulation, will be able to organize and influence regulatory outcomes to a much greater extent than the beneficiaries of environmental regulation, each of whom receives relatively small benefits and thus will be inclined to free-ride on the efforts of others.¹⁶⁹

If, despite the predictions of public choice theory, there has been steady production of environmental regulation by the federal government, one might be disposed to dismiss public choice arguments leveled against state regulation. On this view, public choice problems at the state level should presumptively be no greater than public choice problems at the federal level.¹⁷⁰ Nonetheless, there may be reasons to suspect otherwise. Professor Swire, for example, argues that public choice problems are much more likely to result in undervaluations of environmental quality at the state level than they are the federal level for three reasons. First, Professor Swire contends that states are more likely to seek to externalize the costs of environmental regulation to other states and to future generations than the federal government.¹⁷¹ Second, he suggests that the beneficiaries of environmental regulation will find it much more difficult to influence state regulators than will industry because of information asymmetries and incentives.¹⁷² Finally, Professor Swire notes that information asymmetries may also lead regulators to favor polluters, who can effectively monitor the effects of regulatory decisions, over the public generally, which cannot effectively monitor such effects.¹⁷³

Another public choice problem that is likely to be greatly more prominent at the state level than at the federal level also has to do with the distributive impacts of regulatory decisions. This problem does not involve information asymmetries, but rather, involves those cases in which the distributional issues are quite salient. In such circumstances, the decision costs to state regulators

168. See, e.g., Stewart, *National Good*, *supra* note 17, at 199.

169. The classic exposition of these collective action problems is MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS* (1965). For more recent treatments, see Daniel A. Farber, *Politics and Procedure in Environmental Law*, 8 J.L. ECON. & ORG. 59 (1992).

170. *But see* Andrew J. Green, *Public Participation, Federalism and Environmental Law*, 6 BUFF. ENVTL. L.J. 169 (1999) (study comparing Canadian and American environmental law attributes greater stringency in American law due to centralization; decentralization hampers ability of environmental groups to participate meaningfully in policy formation); Warren L. Ratliff, *The De-Evolution of Environmental Organization*, 17 J. LAND RES. & ENVTL. L. 45 (1997) (arguing that public choice problems will lead states to enact weak environmental standards).

171. Swire, *supra* note 17, at 99-100.

172. *Id.* at 100-103; *see also* Esty, *supra* note 17, at 597-99.

173. Swire, *supra* note 17, at 103-04.

are likely to be quite high, encouraging evasion. The result may be an undesirable bias toward the status quo, neglecting opportunities for welfare gains.

The classic example is the NIMBY, or “not-in-my-backyard,” phenomenon.¹⁷⁴ A simple illustration shows how, in a NIMBY dynamic, sharp distributional issues can frustrate welfare-enhancing moves. Assume that if a state reduces its environmental standards, it will successfully induce a large manufacturing facility to locate within the state’s borders. The manufacturing facility will, when fully complying with the state’s reduced environmental standards, generate significant amounts of air and water pollution. The costs of this pollution are known to be forty units of welfare. It is also known that pollution from existing sources will increase from the change in standards, imposing pollution costs of an additional forty units of welfare. The benefits to be gained by the sale of location rights to the facility are known to be 100 units of welfare. The facility seeks to locate in a small, economically prosperous town that currently hosts no other significant sources of pollution. Of the benefits gained from the sale of location rights, the citizens of the small town will collectively enjoy only twenty units of welfare, with the remaining 80 units distributed throughout the state. The small town will, however, suffer most of the pollution costs—say, thirty units of welfare. Finally, we might also posit that in relaxing standards for existing sources, benefits from increased economic activity will amount to ten units of welfare, distributed mostly outside the small town where the new facility seeks to locate. While the sale of location rights is welfare enhancing in the aggregate (a net gain of thirty welfare units), the costs and benefits are distributed in ways to create sharply concentrated losers and widely dispersed winners. As the logic of collective action suggests, in these circumstances those suffering the concentrated costs are more likely to organize and resist the change than are the citizens who will enjoy the benefits. Presumably, however, the sale will go forward if, but only if, the citizens can agree on a way to redistribute some of the widely dispersed gains to the small town to compensate those who would otherwise suffer welfare losses in the form of pollution costs. More likely, the citizens of the small town will succeed in blocking the sale of location rights.

Even if we assume that the sale would eventually go forward, no economic principle warrants an assumption that this resolution could be achieved in ways that do not themselves involve significant costs. Proponents of state regulation thus assume away what is perhaps the critical question. The theory thus makes an implausible “no transactions costs” assumption—an assumption I had hoped

174. For discussion of NIMBY problems as a species of public choice problems, see Swire, *supra* note 17, at 105-06.

had banished from serious legal scholarship long ago.¹⁷⁵ When the transaction costs are very high, it may be that decision makers—including private actors seeking to benefit by changes in environmental standards—will simply forego desirable changes to avoid such costs.

The sharp distributional issues sometimes associated with decisions regarding environmental quality may also explain why federal regulation may be desirable. Indeed, state regulators might well be inclined to externalize the political costs of such decisions by urging federal regulation. As Professor Dwyer notes, “[s]ome [state] officials may think that federal responsibility for basic policy decisions will help them to deflect political criticism and controversy (‘The Feds made me do it.’).”¹⁷⁶ Because federal authorities are somewhat more removed from the actual conflict, they do not face the same inhibiting structure of political incentives faced by state regulators. The result may be regulation that more closely is aligned with the longer-term “public interest” than state regulation would be.¹⁷⁷

B. Jurisdictional Choice in an Imperfect World: Air Quality as a National Good

Many of the proponents of devolution make a number of assumptions that are contestable. Most strikingly, many extol the efficiency gains to be had from state, rather than federal, environmental regulation. They assume that some of the worst features (from a utilitarian welfarist perspective) of federal environmental regulation—its lack of flexibility and inattention to varying costs and benefits—will magically disappear or, at the least, will not be exacerbated if environmental regulation is handed to the states wholesale. The foregoing discussion shows why such an assumption should not simply be accepted on faith, given the relatively high stakes at issue in environmental federalism debates. Yet, even if one accepts that one or more of the problems discussed above—interstate externalities, information costs, market imperfections, race-to-the-bottom dynamics, and public choice problems—would render state regulation less than optimal, it is by no means clear that minimum federal standards are the right response. From a utilitarian welfarist perspective, the question appropriately might be phrased in terms of which imperfections—those at the state or federal level—pose the greatest threat to welfare.¹⁷⁸

175. See generally Calabresi, *supra* note 132.

176. See Dwyer, *supra* note 45, at 1220 n.177.

177. See Sarnoff, *supra* note 17, at 288 (“Federal regulation may be inherently more “public-regarding” than state regulation because smaller geographical units will not formulate sound policy due to factional pressures.”).

178. See Swire, *supra* note 17, at 95.

Unfortunately, answers to this question are just as ambiguous as the answers to questions about whether and what sorts of “market failures” afflict, or are likely to afflict, state and federal regulation, respectively. In such circumstances, jurisdictional choice might be premised on more generalized considerations, which support a presumption in favor of either federal or state regulation. This is essentially the conclusion of Professor Revesz. He acknowledges that his “starting point is a rebuttable presumption in favor of decentralization,”¹⁷⁹ and rests his charges against federal regulation on the grounds it lacks substantial justification. By contrast, Professors Bratton and McCahery argue that existing economic models offer no real support for the proposition that state regulation will yield efficient outcomes; accordingly, proponents of regulatory competition should be required to bear the burden of demonstrating that devolution will likely result in efficiency gains over federal regulation.¹⁸⁰ Bratton and McCahery thus suggest that it is changes from the status quo that need justification, not the status quo itself.

In my view, Bratton and McCahery have the better argument. While there are no doubt some troubling problems with federal environmental regulation, it is not at all clear that those problems relate primarily to the choice of media-quality standards; instead, the greatest inefficiencies of federal regulation more likely lie with policy instruments chosen to achieve the standards.¹⁸¹ With respect to ozone, the staggering number of citizens who continue to be exposed to unhealthy air makes the suggestion that federal standards are too strict somewhat implausible.

The reasons offered by Professor Revesz in support of his presumption favoring decentralization are not compelling. First, he states that because the nation is “large and diverse, . . . it is . . . likely that different regions have

179. Revesz, *Response to Critics*, *supra* note 128, at 536.

180. Bratton & McCahery, *supra* note 119, at 205.

181. See, e.g., Sidney A. Shapiro & Robert L. Glicksman, *Goals, Instruments, and Environmental Policy Choice*, 10 DUKE ENVTL. & POL’Y F. 297, 300 (2000):

The literature on environmental policy does not always carefully distinguish between the issues raised by the question of how to set the desired level of environmental protection and the question of how to choose among the available instruments for achieving the goal that has been established. This blurring of the conceptually distinct questions of how to set the goal and how to achieve it has prompted criticisms of existing environmental regulatory programs that may not be justified. It has made defensible choices of environmental policy-makers appear to be irrational. In particular, the blurring of the two questions tends to mask the possibility that an environmental policy goal might be set using criteria other than economic efficiency, but that, once the goal has been established, regulators may select the policy instrument likely to achieve that goal at the least cost.

See also Stewart, *National Good*, *supra* note 17, at 213 (describing “grievous flaws” in the manner in which federal environmental standards are pursued, while acknowledging that environmental quality can plausibly be viewed as a “national good”).

different preferences for environmental protection.”¹⁸² Second, Professor Revesz notes that “benefits of environmental protection . . . vary throughout the country.”¹⁸³ Third, he notes that the costs of meeting a given standard also differ across geographic regions.”¹⁸⁴ For these reasons, he believes that state regulation is more likely than federal regulation to reflect the varying preferences of citizens.¹⁸⁵

In respect to the diversity of preferences point, the notion that “regions” have diverse preferences for environmental quality is a confusing one and tends to obscure the relevant inquiry. Individual citizens, not regions, have preferences about environmental quality and it is these preferences that, from a utilitarian welfarist perspective, should control. Professor Revesz’s point is that aggregated preferences will vary from jurisdiction to jurisdiction, as will the collective decisions about environmental quality. He assumes that collective decisions will more likely reflect the diversity of preferences as the size of the jurisdiction decreases. Additionally, however, for Professor Revesz’s diversity point to support the notion that *state* decisions about environmental quality are more likely to reflect differences in preferences across the nation, citizens’ preferences must become relatively more homogeneous at the state level than they are at the federal level. By contrast, if citizens’ preferences for environmental quality vary within states as much and in relatively the same proportions as they do across states, it cannot be assumed that state decisions will be significantly more efficient than will national decisions.

The assumption that citizens’ preferences are relatively more homogenous at the state level than they are at the national level is unwarranted for many, perhaps most, states. Some states are also quite large, with populations holding a diverse range of environmental preferences. Indeed, there may well be as much variation in preferences among citizens within the respective states as there are among citizens within the nation as a whole. In these circumstances, one cannot merely assume that vesting decisional authority in the states will yield a regulatory regime that is more responsive to the diverse preferences of the citizenry than a national regulatory program of minimum environmental standards. Even if some states would arrive at collective decisions about air quality that are significantly less stringent than the current minimum federal standards, the number of states reaching such a conclusion is likely to be very small. As a result, any gains to be had from a closer match

182. Revesz, *Response to Critics*, *supra* note 128, at 536.

183. *Id.*

184. *Id.* at 537.

185. *Id.* at 536.

between standards and citizens' preferences might be vastly overwhelmed by the transaction costs associated with decentralized decision making.

The issue of varying benefits and costs likewise raises important empirical questions about variances among and within jurisdictions. The benefits and costs of environmental regulation are surely not uniform across any state. As Professor Revesz himself notes, "a stringent ambient standard may benefit many people in densely populated areas but only a few elsewhere."¹⁸⁶ Population density, of course, varies as much within many states as it does among states. Likewise, the costs of meeting a state-wide environmental standard are likely to vary quite as much within some states as they do within the nation. If this is right, it seems difficult to conclude that state standards will yield significant welfare gains over federal standards, for state standards might ignore the differences in costs and benefits to the same extent as federal standards.

Even if the foregoing points are deemed unpersuasive, the presumption in favor of state regulation presented by Professor Revesz rests decisively on presumed welfare effects and these effects are assessed by a utilitarian cost-benefit criterion. The implicit assumption is that, although current federal regulation rejects this approach to setting air quality standards, all (or most) states would select policy tools that seek to achieve greater efficiency along this utilitarian vector. That is, arguments for devolution premised on the desirability of achieving more efficient standards assume that citizens would prefer state regulators to make trade-offs between environmental quality and economic growth that current federal law prohibits. The basis for this assumption is nowhere presented. The citizens of the nation as a whole have chosen to base air quality standards only on health effects, precluding consideration of the costs of achieving the selected standards.¹⁸⁷ Why should one assume that, if disaggregated by state, citizens preferences would be distributed in ways that would permit a minority view (nationally)—one in which the costs of air quality become a centrally important issue—to emerge as a majority view at the state level? Absent a convincing explanation of how federal air quality standards are a distortion of citizens' "real" preferences, the more likely conclusion is that citizens would continue to hold the same preferences, regardless of whether it is the state or the federal government that is doing the regulating. While there may be some differences among the states about what standard is deemed sufficient to protect public health, such

186. *Id.* at 536-37.

187. *See Whitman*, 121 S. Ct. at 903. Public opinion polls revealed that, in 2000, two-thirds of voters preferred that air quality standards be strict enough to protect asthmatics, children, and older citizens—the populations most sensitive to ozone. Moreover, nearly 70% of voters preferred that air quality standards be based solely on health considerations, without regard to costs. *See, e.g., at* <http://www.cleanairtrust.org/realize.122600.html> (last visited Mar. 1, 2001).

differences would not be due to differing preferences, costs, and benefits among the various states, and any variation is likely to be rather small. Moreover, it is difficult to make any theoretical conclusions about the comparative efficiency of diverse “health-based” standards relative to federal minimum standards. Most likely, however, there would be substantial economies of scale to be had from federal regulation.

The overwhelming preferences of citizens appear to favor air quality standards based solely on the health effects of pollutants also supports a more direct criticism of those who support regulatory competition among the states. The concern of citizens is not that air quality standards be “efficient”; citizens apparently want an entitlement to healthy air. To make such an entitlement portable, permitting citizens to move freely around the country without fear that their “right” will be compromised, national minimum air quality standards are an effective option.¹⁸⁸

It may be true that the same citizens who voice a preference for such an entitlement may object when the costs of achieving such standards begin to have a discernible impact on them. But, nationally, citizens have largely acquiesced in bearing these costs; indeed, a significant majority voice concern that air quality standards are not tough enough and that current standards are under-enforced.¹⁸⁹

Moreover, efforts to select more efficient standards may founder on the limits of current technologies for making credible assessments of the welfare effects of varying standards. The costs and benefits of achieving minimum federal air quality standards, particularly in the longer term, are quite uncertain, both as an empirical matter and from the perspective of selecting an appropriate methodology for assessment.¹⁹⁰ Accordingly, when one speaks of the costs and benefits of various air quality standards, one is really making an educated guess about a number of critically important factors. To date, forward-looking estimates of the costs of achieving environmental standards have been notoriously unreliable, and generally have been biased in the

188. Professor Stewart, reviewing public opinion polls, has concluded that “the public wants both the federal and the state governments to play a substantial role in environmental protection, according a clear preferences to neither. The public . . . seems to favor this redundancy as p[roviding greater assurance of effective environmental protection.” Stewart, *National Good*, *supra* note 17, at 214-15.

189. See, e.g., at <http://www.cleanairtrust.org/release.122600.html> (last visited March 1, 2001).

190. For recent discussions on appropriate methodologies for assessing regulatory costs and benefits, see Robert H. Frank & Cass R. Sunstein, *Cost-Benefit Analysis and Relative Position*, 68 U. CHI. L. REV. 323 (2001) (concluding that because existing methods ignore relative economic position, they are likely to understate regulatory benefits significantly); David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 24 ECOLOGY L.Q. 545, 587-605 (1997) (discussing theoretical problems of cost-benefit analysis).

direction of vastly overstating the costs.¹⁹¹ If decisions had been based on these estimates, the nation would have experienced a severe welfare loss due to excessive levels of pollution. There is no reason to believe that state regulators would produce more accurate assessments. Thus, even if cost-benefit analysis provides the “right” method for determining the optimal level of air quality in theory, a pragmatic alternative may be to adopt a health-based standard and hope for the best.¹⁹²

Moreover, to base decisions on health criteria alone, as is mandated by the Clean Air Act, is not “irrational” merely because the short-term costs and benefits do not yield a conclusion that such standards are “efficient,” even if methodological difficulties with cost-benefit analysis could be acceptably resolved. The architects of the Clean Air Act believed, as do perhaps most citizens, that, when pressed, polluters will find effective ways to control pollutant emissions at reasonable costs.¹⁹³ Thus, the statute has consistently been described as adopting a “technology-forcing” strategy to air quality problems.¹⁹⁴ Noting that such a strategy can be sensible, Justice Breyer, in *Whitman v. American Trucking*, stated:

Technology-forcing hopes can prove realistic. Those persons, for example, who opposed the 1970 Act’s insistence on a 90% reduction in auto emission pollutants, on the ground of excessive cost, saw the development of catalytic converter technology that helped achieve substantial reductions without the economic catastrophe that some had feared. . . .

At the same time, the statute’s technology-forcing objective makes regulatory efforts to determine the costs of implementation both less important and more difficult. It means that the relevant economic costs are speculative, for they include the cost of unknown future technologies. It also means that efforts to take costs into account can breed time-consuming and potentially unresolvable arguments about the accuracy and significance of cost estimates.

191. *See id.* at 600.

192. *See* Shapiro & Glicksman, *supra* note 181, at 302 (noting that health-based standards “might make sense on more pragmatic grounds in circumstances in which the policy-making entity has relatively good information about the relationship between various levels of exposure and resulting harm to health or the environment (i.e., a well-defined dose-response curve), but not much information about the costs of employing alternative technological fixes”).

193. *Whitman*, 121 S. Ct. at 922-23 (Breyer, J., concurring) (discussing technology-forcing strategy of the Clean Air Act).

194. *Id.*; *see also* *Union Elec. Co. v. EPA*, 427 U.S. 246, 257 (1976) (stating that the Clean Air Act was “expressly designed to force regulated sources to develop pollution control [***58] devices that might at the time appear to be economically or technologically infeasible.”). For a discussion of the technology-forcing strategy of environmental law, *see* D. Bruce La Pierre, *Technology-Forcing and Federal Environmental Protection Statutes*, 62 IOWA L. REV. 771 (1977).

Congress could have thought such efforts not worth the delays and uncertainties that would accompany them.¹⁹⁵

If one of the objectives of environmental policy is to reduce “wasteful” uses of our natural resources—an objective that economists and others might both support with enthusiasm—technology-forcing through health-based standards may be an important and appropriate policy choice. In environmental matters, costs and benefits often cannot be meaningfully assessed, making it difficult to frame policy choices in terms of marginal analysis—*i.e.*, the point at which the benefits of the next increment of improvement in environmental quality are equal to the costs of achieving that increment.¹⁹⁶ Accordingly, “satisficing” rather than “optimizing” solutions are called for.¹⁹⁷ In the absence of some restriction on pollution-generating activities, polluters simply have few incentives to invest in innovation to reduce the amount and kinds of pollution that is generated. With regulation, polluters are faced with added costs—costs that profit-maximizing entities will seek to reduce. Greater investment in developing pollution-reducing innovations thus becomes a profit-maximizing strategy; such investment may drive more rapid technological change that lowers overall costs:

[R]egulation provides or requires the generation of information; since information is a public good it may be underprovided without such incentives. . . . [Additionally, r]egulation reduces uncertainty about the payoffs to investments in environmental innovation. There may be potential investments that are believed to be profitable in an expected value sense, and also deliver environmental benefits, but which are highly risky in the absence of regulation that ensures that the environmental benefits are also privately valuable. Regulation, in effect, provides ‘insurance’ against the risk of investing in new technology, part of whose benefit cannot be internalized. . . . [Moreover] technology that is initially more costly may produce long-run competitive advantage, because of learning-by-doing or other “first-mover” advantages Finally, regulation simply creates pressure. Such pressure plays an important role in the innovation process, “to overcome inertia, foster creative thinking and mitigate agency problems.”¹⁹⁸

195. *Whitman*, 121 S. Ct. at 922-23 (Breyer, J., concurring).

196. *See Swire*, *supra* note 17, at 95-98 (discussing measurement problems).

197. On “satisficing,” as distinguished from “optimizing,” see Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption From Law and Economics*, 88 CALIF. L. REV. 1051, 1075-76 (2000).

198. Adam B. Jaffe, *et al.*, “Technological Change and the Environment,” paper prepared as a chapter of THE HANDBOOK OF ENVIRONMENTAL ECONOMICS (Karl-Göran Mäler & Jeffrey Vincent, eds., forthcoming), pp. 21-26 (*quoting* M.E. Porter & C. van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSPECTIVES 97, 98 (1995)), available at Social Science Electronic Research Library, at http://papers.ssrn.com/sol3/papers.cfm?cfid=790370&cftoken=39052807&abstract_id=24585 (posted Oct. 13, 2000); *see*

Minimum federal air quality standards can importantly influence incentives for technological innovation. First, if these standards are backed by consistently applied federal sanctions on states that fail to achieve the federal standards,¹⁹⁹ state regulators have an incentive to devise pollution control strategies that achieve the standards while imposing the least net costs on their citizens. In theory, this will encourage states to invest in innovative regulatory strategies to a greater extent than they would in the absence of a federal mandate. In this sense, the “cooperative federalism” structure of the original Clean Air Act itself can be viewed as an exercise in “technology-forcing” in the realm of state regulatory programs. In the absence of a federal mandate, state regulators might conclude too quickly that strict environmental standards are infeasible for economic or other reasons. Admittedly, the current Clean Air Act radically restricts this potential by imposing extensive control requirements on states with nonattainment areas.²⁰⁰ Arguably, these requirements would be unnecessary if federal sanctions were applied consistently and aggressively.

Second, federal standards may minimize the disincentive for innovation provided by an state “voice” or “exit” option—*i.e.*, avoiding pollution controls through concessions gained from the states or by re-locating to another jurisdiction. While this effect is somewhat speculative, given the states’ discretion to distribute the clean-up burden, the general direction of the incentive effects created by federal minimum standards would likely tend toward greater investment in innovation on the part of regulated firms than would occur in the absence of such standards. Given the uncertain—yet, quite remarkable—pace of technological innovation, it is not at all fanciful to suggest that the incentives created by minimum national ambient air quality standards will eventually make clear that attaining them is not only a bargain, but in some circumstances a “win-win” solution. On this view, “regulation may lead to ‘innovation offsets’ that can not only lower the net cost of meeting environmental regulations, but can even lead to absolute advantages over firms . . . not subject to similar regulations.”²⁰¹

CONCLUSION

Professor Stewart has recently concluded that, because the American public views environmental quality as a “national good,” the usual criticisms

also Alan S. Miller, *Environmental Regulation, Technological Innovation, and Technology-Forcing*, NAT. RES. & ENVTL., Fall 1995, at 64.

199. See 42 U.S.C. §§ 7410(c) (authorizing federal implementation plan as substitute for inadequate state plans); 7410(m) (discretionary sanctions); 7509 (mandatory sanctions).

200. See, *e.g.*, 42 U.S.C. §7511a (plan requirements for ozone nonattainment areas).

201. Jaffee et al., *supra* note 198, at 24 (quoting Porter & C. Van der Linde, at 98 (1995)).

of federal environmental regulation advanced by critics who employ “the usual assumptions of the welfare economic/optimal environmental jurisdictional analysis” are somewhat off-target.²⁰² Instead, given the strong support for the current federal regulatory structure on the part of the public, “environmental programs should presumptively be federal unless ‘centralization failure’ dictates decentralization.”²⁰³

Treating air quality as a national good is consistent with the environmental character of many air quality problems, which involve extensive interstate pollution. Even for pollutants that do not travel long distances, many large urban areas straddle state lines, making a state-centered approach to air quality a terribly inefficient alternative, given the high transactions costs of securing agreement between states on appropriate goals for air quality regulation and, especially, the manner in which control obligations should be distributed as between the states. In the end, however, the best justification for national ambient air quality standards is that the vast majority of citizens have come to view the goals represented by such standards as an appropriate constraint on our willingness to secure short-term economic advantages at the cost of long-term environmental health. Minimum federal air quality standards exude a national optimism about our ability to innovate and achieve desirable natural environments while enjoying a vibrant, sustainable economy. While the continuing extent of ozone nonattainment casts some doubt on whether such technological optimism is warranted, a longer-term perspective may suggest otherwise. In the three decades since the enactment of the 1970 Clean Air Act and the decade since the 1990 amendments, much progress has been made. The clear motive force of that progress has been a strong federal role. While devolution may be attractive in theory, prudence may warrant a bit more patience with federal air quality regulation than the critics have been willing to endure.

202. See Stewart, *National Good*, *supra* note 17, at 212.

203. *Id.* at 213.