

Should Congress Direct the EPA to Allow Serious Harms to Public Health to Continue?: Cost-Benefit Tests and NAAQS under the Clean Air Act

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I. INTRODUCTION

The Clean Air Act (CAA or the Act) currently has a goal of protecting public health. This goal finds concrete expression in Section 109 of the Act. That provision directs the Environmental Protection Agency (EPA or the Agency) to write primary national ambient air quality standards (NAAQS) that adequately protect public health, with an “adequate margin of safety.”¹ This provision formally prohibits the EPA’s consideration of cost in setting the NAAQS.²

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1. CAA § 109(b)(1), 42 U.S.C. § 7409(b)(1) (1994). I refer here to the primary NAAQS. The Act also authorizes secondary NAAQS to protect the public welfare. *See id.* § 109(b)(2), § 7409(b)(2).

2. *See Lead Indus. Ass’n v. EPA*, 647 F.2d 1130, 1148 (D.C. Cir. 1980).

As a result, when the EPA recently evaluated accumulating data demonstrating that legally accepted smog levels cause tens of thousands of annual deaths, asthma, and other respiratory problems, it revised its standards for soot (particulate) and harmful ground level ozone³ to reflect its best estimate of adequate health protection.⁴ An element of discretion may enter into the EPA's choice of a safe level, but the Act compelled the Agency to make these standards at least somewhat stricter, in light of the data in the rulemaking record.⁵

Does the devotion to public health protection that Section 109 reflects really make sense? Should the Agency have discretion to leave the standards where they are or make them less stringent, based on a cost-benefit test?

The conventional way of framing the balancing question, whether a "cost-benefit" test should govern an administrative decision, seems a little misleading. Pollution reductions do not really confer benefits, rather, they prevent the continuation of ongoing harms.⁶ Many people suffer from asthma and other lung ailments on smoggy days.⁷ Some end up in the hospital or even die from pollution related ailments.⁸ The Act aims to stop these harms from continuing. One might restate the balancing question more precisely as follows: Should Congress authorize the EPA to allow ongoing harms to continue if the EPA concludes that the value of preventing these harms is less than the cost?

The restatement of the balancing question clarifies the meaning of the term "benefits" in this context, but leaves unanswered a second fundamental question: What do we mean by "costs"? Traditionally, environmental law has assumed that the term costs (in a cost/harm analysis) refers to the money polluters spend to comply with regulatory requirements.⁹ Unless we know what we mean by costs, we cannot have a very clear view of the merits of a cost/harm test for setting the NAAQS.

3. Harmful ground-level ozone is distinguished from helpful stratospheric ozone that screens out ultraviolet radiation. See NATIONAL RESEARCH COUNCIL, RETHINKING THE OZONE PROBLEM IN URBAN AND REGIONAL AIR POLLUTION 19-23 (1991).

4. See National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. 38,652 (1997) (to be codified at 40 C.F.R. pt. 50); National Ambient Air Quality Standards for Ozone, 62 Fed. Reg. 38,856 (1997) (to be codified at 40 C.F.R. pt. 50).

5. See *American Lung Ass'n v. EPA*, 134 F.3d 388, 393 (D.C. Cir. 1998) (suggesting that the EPA must establish a margin of safety from documented health effects).

6. See David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 24 *ECOLOGICAL L.Q.* 545, 560-62 (1997) [hereinafter *Beyond CBA*].

7. See S. REP. NO. 101-228, at 7, 8 (1989), reprinted in 1990 U.S.C.C.A.N. 3385, 3387-95.

8. See *id.*

9. See *Beyond CBA*, *supra* note 6, at 567 n.98.

Even absent changes in the statutory test governing the NAAQS, the government takes costs into account in a variety of other ways. Congress considered implementation costs when it substantially revised the Act in 1990 and evidently concluded that nobody had made a compelling economic case to abandon the public health protection goal.¹⁰ However, Congress did expand the role of cost considerations under some statutory provisions, but not those governing the setting of the NAAQS.¹¹ Congress also took administrative feasibility into account by stretching the deadlines for meeting the NAAQS.¹²

While the Act does not authorize consideration of costs in determining what constitutes clean air, it has always authorized consideration of costs in deciding *how* to achieve the NAAQS.¹³ When the EPA revises a NAAQS, it determines what measured concentration of a pollutant in the atmosphere it considers safe.¹⁴ Under the Act, states must decide which pollution sources to address and how stringently to regulate their emissions in order to meet the standard.¹⁵ The states may take economic considerations into account when making their decisions.¹⁶ Hence, without changing the statute, states can choose the most “cost effective” means of meeting the goal of clean air. Acceptance of the statutory goal of protecting public health, then, does not necessarily involve a rejection of all cost considerations.

One may, however, question the view that protection of public health should remain the overriding goal. I will examine below the basic reasons that public support for the health protection goal has remained in place, despite prolonged attack by both industry and some academics.¹⁷ I will then discuss the question of whether Congress should adopt a

10. See H.R. REP. NO. 101-490, at 159-94 (1990), *reprinted in* A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, S. REP. NO. 103-38, at 3183-3218 (1993) (title by title cost estimates for 1990 Amendments); S. REP. NO. 101-228, at 1-9, 39-41, 90-91, 94, 111, 113-114, 122, 127-31, 186-88, 261-301 (1989), *reprinted in* 1990 U.S.C.C.A.N. 3385, 3387-95, 3425-27, 3475-76, 3479 (information about costs of various provisions of the 1990 Clean Air Act Amendments).

11. See, e.g., CAA § 112(d), 42 U.S.C. § 7412(d) (1994 & Supp. I 1995) (authorizing consideration of costs in setting toxics standards). The standards the EPA promulgates under the cited section regulate hazardous air pollutants, many of which are volatile organic compounds that contribute to ozone formation.

12. See CAA § 181, 42 U.S.C. § 7511.

13. See *Union Elec. Co. v. EPA*, 427 U.S. 246, 266 (1976) (states may take costs into consideration in deciding how to meet the NAAQS).

14. See National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. 38,652 (1997) (to be codified at 40 C.F.R. pt. 50).

15. See CAA § 110, 42 U.S.C. § 7410.

16. See *Union Elec.*, 427 U.S. at 266.

17. See *Beyond CBA*, *supra* note 6, at 555-63.

cost/harm test to place yet more emphasis on short-term cost considerations.

II. WHY HAS THE HEALTH PROTECTION GOAL REMAINED IN PLACE?

Many people may believe that they have a right to breathe air that will not cause them to become ill or die. That right seems quite fundamental, because we do not have a choice about whether to breathe. Millions of people breathing unhealthy air on a daily basis may consider healthy air a right unjustly denied them.

The view that environmental law should protect public health strikes some sophisticated observers as naive. Because scientifically established safe levels of exposure do not exist for ozone or particulate matter,¹⁸ the complete elimination of any risk to public health might require zero emission levels for relevant pollutants.

This argument, however, does not really justify a cost/harm test. Rather, this argument suggests that applying the existing test may be difficult. This argument raises the question of whether the EPA should set standards at a zero level for some pollutants.¹⁹

Relevant precedent suggests that the EPA may have no obligation to establish a zero level NAAQS,²⁰ despite a zero limit's obvious congruity with the literal language in Section 109 requiring an "adequate margin of safety."²¹ The United States Court of Appeals for the District of Columbia Circuit held that similar language in Section 112 of the Act, which governs toxic pollutants, does not require a zero level.²² The court relied on the lack of extrinsic evidence of a specific congressional intent to mandate a zero level.²³ This means that the Agency may have some authority to neglect the possibility of some less serious health consequences, but the adequate margin of safety language strictly—albeit awkwardly—limits that authority.²⁴ The existence of the nonthreshold

18. See *NRDC v. EPA*, 902 F.2d 962, 969 (D.C. Cir. 1990) ("data does not provide evidence of a clear threshold" for safety from particulate pollution); *EPA Proposed Clean Air Regulations, Testimony Before the Subcommittees on Health and the Environment and Oversight and Investigations of the House Commerce Comm.*, 105th Cong. 18-19 (1997) (testimony of Mary D. Nichols, Assistant Administrator for Air and Radiation, EPA) (explaining the lack of clear threshold for ozone) [hereinafter Nichols Testimony].

19. Since biogenic sources of ozone exist, a zero level may have to mean a level obtainable with no anthropogenic emissions, rather than an absolute zero level of ozone.

20. See *NRDC v. EPA*, 824 F.2d 1146, 1154 (D.C. Cir. 1987) (en banc).

21. CAA § 109, 42 U.S.C. § 7409 (1994).

22. See *NRDC*, 824 F.2d at 1162-63 (interpreting ample margin of safety standard for hazardous air pollutants not to require zero emissions).

23. *Id.* at 1153.

24. See *id.* at 1152 (Section 109 affords a reasonable degree of protection against unresearched hazards).

difficulty (i.e., science's inability to identify a threshold below which a pollutant is safe) does not necessarily imply that we must choose to balance health considerations against economic ones in setting the NAAQS. Rather, it simply means that we must either choose a zero level for pollutants or recognize some element of discretion in deciding what constitutes an adequate margin of safety.²⁵

Economics furnishes a more relevant argument against a NAAQS protecting public health. Many economists argue that money devoted to protecting the public health from air pollution cannot be used to meet other needs.²⁶ Accordingly, there is always a choice between various "amenities," and policy-makers should decide whether the benefits of any particular decision are worth the costs.²⁷ For example, funds devoted to pollution control may not be used for childhood vaccinations.

This rather general theoretical argument about prioritizing, however, faces problems when translated into a demand that administrative agencies apply a cost/harm test to public health and safety regulations (a step that politicians and industry lobbyists have advocated more often than economists).²⁸ Strictly speaking, health constitutes a necessity, not an amenity. Good health is essential to day-to-day functioning in a way that most other things are not.

Furthermore, failing to strictly regulate pollution will probably not lead to more vaccines for children or anything of similar value. This laxity may lead to more profits for polluters or slightly cheaper consumer goods. High profits and cheaper consumer goods are desirable, but pursuit of those particular things does not justify continuing to hospitalize and kill thousands of people annually.

It is possible that advocates of a cost/harm test as a prioritizing mechanism believe that devoting fewer taxpayer dollars to draft and enforce clean air regulations allows Congress to better fund childhood vaccinations. But writing lax standards may cost the government roughly the same amount of money as writing strict standards. Indeed, past experience with cost/harm analysis suggests that it will greatly increase the amount of taxpayer money spent per regulation, regardless of the

25. See *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1146, 1162 (D.C. Cir. 1980).

26. See WILLIAM F. BAXTER, *PEOPLE OR PENGUINS: THE CASE FOR OPTIMAL POLLUTION* 9-13 (1974); see also Paul Weiland, *Unfunded Environmental Mandates: Causes, Burdens, and Benefits*, 22 HARV. ENVTL. L. REV. 283, 297 (1998).

27. See, e.g., BAXTER, *supra* note 26.

28. See, e.g., KENNETH ARROW ET AL., *BENEFIT-COST ANALYSIS IN ENVIRONMENTAL, HEALTH, AND SAFETY REGULATION: A STATEMENT OF PRINCIPLES* 3 (1996) ("[A]gency heads should not be bound by a strict cost-benefit test."). A large number of prominent economists signed this statement. *Id.* at 15-18.

results.²⁹ Hence, economic's general theoretical point regarding allocation of scarce resources fails as a compelling policy argument to justify abandoning a health protection goal in favor of a cost/harm test.

Saying that the costs of a particular NAAQS may outweigh the value of the avoided harms does not solve this problem, it merely restates it. A statement that the costs of a regulation outweigh its benefits has no discernible meaning without first assigning weight to the positive and negative consequences of regulation.³⁰ In the end, a statutory cost/harm test constitutes a decision to trust the Agency to make essentially unguided policy judgments usually left to Congress, as long as the Agency provides elaborate technocratic justifications.³¹ Such a delegation tends to disempower citizens, because nonelected officials make decisions in an arcane administrative forum that makes effective participation difficult due to its technocratic nature. By contrast, the current standard confines the Agency to the relatively narrow task of deciding what level of pollution can be tolerated without harm to public health.³² Congress has already made the most basic policy decision.

Advocates of cost/harm tests have simply failed to specify what precise consequences would justify not protecting public health. Moreover, agencies face important constraints in making judgments under a general cost/harm standard that may lead them to neglect important public values.

Strong public support for health-protective goals may reflect a reasoned response to the experience we have with clean air regulations. For decades polluters have complained about the cost of regulation and predicted that those costs would trigger economic catastrophe, but for more than twenty-five years the Act has reduced pollution, while the economy and employment have grown.³³ Hence, a cost/harm test may allow marginal economic considerations, such as the desire of most polluting companies to cut environmental compliance costs, to displace important public values.³⁴

29. See *Beyond CBA*, *supra* note 6, at 601-05.

30. See, e.g., Duncan Kennedy, *Cost-Benefit Analysis of Entitlement Problems: A Critique*, 33 STAN. L. REV. 387 (1981) (outcomes of cost-benefit analysis are indeterminate in theory); Lawrence A. Tribe, *Policy Science: Analysis or Ideology*, 2 PHIL. & PUB. AFF. 66, 70 (1972) (same).

31. See *Beyond CBA*, *supra* note 6, at 606-09.

32. See *id.* at 608-09 n.272 (providing a detailed defense of the proposition that a cost-benefit standard delegates with less precision than a health-based standard).

33. See EPA, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT, 1970 TO 1990 ES-4 (1997).

34. See *Beyond CBA*, *supra* note 6, at 581.

Strong ethical considerations support the notion that we all have an obligation to avoid seriously harming our neighbors' health.³⁵ Restructuring the law to disaffirm these moral obligations probably requires a rather compelling justification: something more compelling than the abstract notion that it is always possible that health protection may cost "too much." Even if the aggregate cost outweighs the aggregate harm, it would not justify allowing high rates of childhood asthma in inner city neighborhoods that stand to benefit little or not at all from the cost savings involved in allowing preventable pollution. A cost/harm test will tend to obscure this and other important environmental justice issues.

Citizens may fear that a government agency, pressed hard by well-funded lobbying groups for regulated industry, may tend to undervalue environmental harms when implementing a cost/harm standard. For reasons that I have already discussed at length elsewhere, their fears are well founded.³⁶ The pollutants that states must control to meet ozone and particulate matter standards contribute to a large number of unquantifiable environmental and public health problems.³⁷ Indeed, the EPA's recently completed cost/harm analysis of past efforts to reduce air pollution stated that the EPA could not quantify reproductive damage, ecosystem destruction, global warming-related damages, cancers, and neurological injuries from air pollution.³⁸ There is no reason to think that these problems are trivial, but quantifying these problems has proved impossible.³⁹ Hence, they may receive little or no weight in decision-making under a cost/harm test.⁴⁰

A cost/harm test may facilitate casting aside people's lives and health when nothing economically fundamental is at stake, or worse, when strict controls would generally help the economy while harming the economic interests of powerful polluters. The interests at stake in the cost debate must be examined more closely.

III. UNPACKING COST

Harm valuation is generally thought of as the Achilles heel of cost/harm approaches in the environmental area. Harm valuation is

35. *See id.* at 560-63.

36. *See id.* at 587-600.

37. *See id.* at 594-95.

38. THE BENEFITS AND COSTS OF THE CLEAN AIR ACT, *supra* note 33, at ES-5. These problems are relevant to the NAAQS. Nitrogen oxides, precursors to ozone regulated under the urban smog provisions of the Act, contribute to global climate change and acid rain. *See id.* Volatile organic compounds, precursors to ozone, include hazardous air pollutants that may cause cancer, neurological problems, and birth defects in humans and animals. *See id.* at ES-5 to ES-6.

39. *See id.* at ES-5.

40. *See Beyond CBA, supra* note 6, at 594-600.

problematic, because we do not know how to value an avoided death or serious illness, a beautiful view, the health of a forest, or the ability to exercise outside without chest pains and heavy wheezing.

But the cost problem is more difficult than generally realized. A careful consideration of this problem assists in evaluating the desirability of a cost/harm test for the NAAQS.

Four questions concerning costs will be examined below. First, putting environmental "benefits" to the side for the moment, are compliance costs always bad things that should be minimized? Second, can the EPA accurately estimate pollution control costs when revising a NAAQS? Third, would it aid implementation to use a cost/harm test to make a NAAQS less stringent? And finally, how should Congress evaluate arguments to make a particular NAAQS less stringent?

A. Are Compliance Costs Undesirable?

High pollution control costs are generally thought of as undesirable. Cost/harm tests treat costs as bad things that must be weighed against the good things environmental protection offers.

This view of costs, however, is simplistic because costs may often have favorable economic consequences. Administrative proceedings offer a poor forum for deciding whether costs are good or bad, because such judgments may properly depend upon a political calculus conducted by people elected for their understanding of public values.

1. Jobs

Pollution control requirements force polluters to create jobs by hiring people to control pollution, which may explain why many employers intent on "downsizing" resist them vigorously. Ironically, congressional proponents of cost/harm tests argue that health protective regulations destroy jobs.⁴¹ Indeed, the House of Representative's principal vehicle for regulatory reform in the 104th Congress bore the title, "Job Creation and Wage Enhancement Act of 1995."⁴²

In fact, environmental requirements generally have created a small net increase in employment.⁴³ Environmental costs, according to plant managers, probably account for less than one-tenth of one percent of mass

41. See, e.g., 142 CONG. REC. S3762-63 (daily ed. Apr. 22, 1996) (statement of Sen. Grams (R-MN)); 141 CONG. REC. S9606-07 (daily ed. July 10, 1995) (statement of Sen. Hatch (R-UT)); 141 CONG. REC. H2261, 2270 (daily ed. Feb. 27, 1995) (statement of Rep. Oxley (R-4th OH)).

42. See H.R. 9, 104th Cong. (1995).

43. See E. B. GOODSTEIN, JOBS AND THE ENVIRONMENT: THE MYTH OF A NATIONAL TRADE-OFF 1 (1994).

layoffs.⁴⁴ Mergers account for a significant percentage of layoffs, yet they receive relatively little federal attention as an employment issue.⁴⁵

A cost/harm approach does not separate job destroying regulation from job creating (or job neutral) regulation because the employment consequences of regulation have nothing to do with the ratio of costs to avoided harms. Rather, the employment consequences of regulation depend upon the ratio of costs to a firm's ability to pay. A simple example will illustrate this point.

Suppose that a company with annual revenues of \$1,000,000 must comply with two regulations, each requiring \$10,000 worth of compliance expenditures. One of these regulations restricts emissions of "Dangerous," a chemical that causes \$100,000 worth of damage. This regulation has a favorable one to ten cost/harm ratio (a \$1 expenditure avoids \$10 worth of harm). The other regulation limits a chemical called "Mild" that causes \$1,000 worth of damage. This regulation has an unfavorable cost/harm ratio of ten to one (a \$10 expenditure avoids \$1 worth of harm). Each of these regulations may generate jobs at this company in equal numbers, although the cost/harm ratio for regulating Dangerous is more favorable than the cost/harm ratio for regulating Mild because both regulations have the same \$10,000 compliance cost.

Now let us assume that these two regulations apply to a company with significantly less revenue. If the company cannot spend more than \$9,000 on environmental compliance costs, then applying either regulation might drive the company out of business. The employment impact does not depend upon whether we apply the regulation with a favorable cost/harm ratio or the regulation with an unfavorable cost/harm ratio.

Most economists would respond to arguments concerning direct employment consequences of compliance expenditures by stating that even in cases where an environmental regulation directly creates jobs, it imposes an opportunity cost that may cost jobs.⁴⁶ Economists may presume that the company required to invest in pollution control measures would invest in something else absent regulation. A pollution control obligation may force a regulated company to forego potential job-creating investment in its business. Assuming that a regulated company would invest the savings associated with unregulated pollution productively—instead of, for example, paying shareholder dividends, increasing executive salaries, or buying some other business—does not establish that

44. *See id.* at 4.

45. *See id.* at 14.

46. *See id.* at 20-25.

environmental regulation involves a net decrease in jobs. To evaluate this net employment impact, the number of jobs that the foregone opportunity would have created must be compared to the number of jobs created as a result of pollution control measures.⁴⁷ Pollution control expenditures tend to generate “blue-collar” employment that has been in particularly short supply in recent years.⁴⁸ Costs to polluters may provide economic benefits to workers.

2. Tradeoffs Between Long-Run and Short-Run Costs

Even when high pollution control costs have negative economic consequences in the short-term, they may lead to economic benefits in the long-term. Assume that the EPA decided to impose strict pollution control requirements upon electric utilities. This effort might initially entail a substantial cost to coal-fired utilities. The economy may, however, adjust to these costs in a way that enhances wealth in the long-term. Large coal-fired power plants would find themselves competing with cleaner generators. As long as standards do not require the use of any particular fuel and are sufficiently stringent, they could economically benefit cleaner power sources, even if they harm the owners of large coal-fired plants. Even if this competition does not benefit consumers at first, it may do so in the future. The price signal from the new standard may encourage owners of cleaner fuel sources to invest in innovations and to scale-up production in ways that can lower prices.⁴⁹

Even if prices do not fall in the ensuing competition, consumers may still reduce their costs. Consumers do not buy electricity because they like current. Electricity is a means towards the ends of lighting and heating homes, washing clothing, and refrigerating food. If electricity prices rise, then appliance manufacturers, light bulb makers, and renovators may compete more vigorously to improve energy efficiency.⁵⁰ Society may consume less electricity, but pay an equal amount for the same energy services, while producers of energy efficient technology benefit economically at the expense of the utilities.⁵¹ Through innovation, the economy has some ability to adjust to regulatory costs, and may even lower costs (if regulations are stringent enough to make fundamental changes worthwhile).

Furthermore, when nonrenewable resources are burned, they are unavailable for future use. High prices for nonrenewable products may

47. See *Beyond CBA*, *supra* note 6, at 575 n.132.

48. GOODSTEIN, *supra* note 43, at 7-8.

49. See *Beyond CBA*, *supra* note 6, at 569.

50. See *id.* at 569-70.

51. See *id.* at 570.

be desirable because they encourage the proper conservation of resources over time.⁵² Otherwise, current affluence may be exchanged for future penury. These considerations may receive little or no consideration in a cost/harm analysis, in part because of the inability to accurately predict dynamic responses and adjustments.

B. Can the EPA Accurately Estimate the Costs of Compliance with a National Ambient Air Quality Standard?

Studies comparing estimated regulatory costs with *actual* compliance almost always show that regulators greatly overestimate costs.⁵³ In the context of the NAAQS, the problem of exaggerating control costs becomes particularly acute. In order to forecast what polluters must spend to comply with a proposed NAAQS, the EPA must know precisely what each regulated polluter will do to help clean up the ambient air. Prior to the promulgation of a NAAQS, however, the EPA cannot predict each polluter's actions because the states and the polluters themselves generally determine compliance strategies under the Act years after the EPA revises the NAAQS. Of course, both states and polluters have incentives to choose inexpensive compliance strategies over expensive ones.

It is necessary to understand the Act's structure and its relationship to the problem of estimating the cost of a NAAQS revision to properly appreciate the difficulty of estimating costs. The EPA would need to estimate the total quantity of emission reductions required to meet a proposed NAAQS as the first step in determining overall compliance costs. Several years after the EPA revises a standard, states must inventory their emission sources, measure their existing air quality, and estimate the quantity of reductions needed to meet the standard.⁵⁴

A demand that the EPA make a cost estimate prior to NAAQS revision would effectively force the Agency to complete this work long before the law requires states to submit their plans to meet the standards.⁵⁵ But this work requires years of data collection and analysis in many different states. The Act recognizes the difficulty of these tasks by

52. See generally *id.* at 571-73.

53. See Eban Goodstein & Hart Hodges, *Polluted Data: Overestimating Environmental Costs*, AM. PROSPECT, Nov.-Dec. 1997, at 64; THOMAS O. MCGARITY, REINVENTING RATIONALITY: THE ROLE OF REGULATORY ANALYSIS IN THE FEDERAL BUREAUCRACY 131 (1991); Michael E. Porter & Class Van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSP. 97, 98 (1995).

54. See CAA §§ 181(a)(1), (3), (b)(1)(A)(i), (c)(2)(A), (d), (e), 172(c), 42 U.S.C. §§ 7511a(a)(1), (3), (b)(1)(A)(i), (c)(2)(A), (d), (e), 7502(c) (1994 & Supp. I 1995).

55. See CAA §§ 110(a), 181(b)(1), 182, 42 U.S.C. §§ 7410(a), 7511(b)(1), 7511a.

allowing states several years to complete these tasks.⁵⁶ The data collection and analysis requires state officials' efforts, in part, because the EPA does not have enough staff to carry out these tasks.⁵⁷

Even if Congress were to multiply existing EPA resources to accomplish these tasks ahead of time, a very unlikely scenario, the estimates of needed reduction would still not be timely. By the time states actually prepare plans to meet a revised NAAQS, the ambient air quality and the actual emissions profiles will have changed significantly as some polluting companies commence operation, others close, and more vehicles hit the road.⁵⁸ All of these changes are extremely unpredictable. Clearly, the amount of required reductions needed varies with the quality of the ambient air and the amount of existing emissions.

The difficulty of correctly estimating the amount of required reductions is only the first of a series of problems. If the EPA successfully estimates the total needed reductions, it must then decide the amount that each polluter must reduce. The Act normally leaves most of this allocative task to the states because it involves political judgments thought best left to state, rather than federal, resolution.⁵⁹ The EPA's ultimate cost estimate would depend greatly upon who is targeted for reductions. But the EPA would generally have no power to impose its allocation choices upon states unless a state failed to meet its obligations under the Act.⁶⁰

Finally, the EPA would then determine how each polluter would comply with its pollution control obligations. This involves a plethora of difficulties. First, even under conventional technology-based regulations, most of which are performance standards, polluters may usually choose

56. See, e.g., CAA § 182(c)(2)(A), 42 U.S.C. § 7511a(c)(2)(A) (serious areas required to submit demonstration four years after the Act's passage showing that its plan will produce timely attainment).

57. See CAA § 182, 42 U.S.C. § 7511a.

58. Predicting the effect of future emission decreases on ambient air is a very uncertain, and therefore contentious, exercise. In order to estimate the amount of emission reductions needed, the EPA would have to model the effect of future emission reductions on future air quality. The EPA modeling to support its cost estimates would likely inspire polluters to offer competing modeling demonstrations strategically chosen to advance their interests. This would lead to prolonged conflict and litigation surrounding any NAAQS revision.

59. See CAA §§ 110, 182, 42 U.S.C. §§ 7410, 7511a; *Union Elec. Co. v. EPA*, 427 U.S. 246, 266 (1976).

60. See CAA § 110(c), 42 U.S.C. § 7410(c) (requiring federal implementation plan in the event of state failure to meet planning deadlines). The EPA may mandate regional programs prior to an implementation failure, but only upon request of a regional "ozone transport commission" consisting of state representatives. See CAA § 183, 42 U.S.C. § 7511b. The EPA may also order abatement of interstate pollution without a state implementation failure, but only upon request of a state or local government. See CAA § 126, 42 U.S.C. § 7426.

their own compliance method.⁶¹ Second, the EPA has encouraged emissions trading, which may reduce costs by an amount difficult to predict in advance.⁶² Finally, the EPA has encouraged pollution prevention, which often produces significant, yet unpredictable, cost savings.⁶³ Having hypothetically decided what each pollution source would do to comply, the EPA would then have to predict the cost of the relevant compliance mechanisms. History suggests that the EPA would likely grossly overestimate those costs.

Even if the EPA could predict precisely what polluters would do when writing a particular emission standard long before actual state promulgation of emission standards, the time lag between promulgation of a NAAQS and polluter compliance with subsequent state emission standards is long enough to allow for substantial improvement in pollution control technologies and identification of new prevention strategies. Unfortunately, the EPA cannot accurately predict the magnitude of the cost-saving opportunities these innovations will create. Absent a solid basis for prediction, the adversarial administrative process may force the Agency to tacitly give innovation a precise, but incorrect, zero valuation.

Cost estimates are often made in advance for things that are difficult to estimate. But requiring the EPA to make cost and harm estimates the basis for its air quality decisions would force it to overestimate costs. Under these circumstances, analytical difficulties, rather than real-world economic problems, might drive decisions weakening ambient standards.

Even without the difficulty of having to comply with a cost/harm test, the EPA has generally failed to revise ambient standards every five years⁶⁴ as the Act requires.⁶⁵ If cost/harm tests become mandatory, the

61. See David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Displacing the Command and Control/Economic Incentive Dichotomy*, 55 WASH. & LEE L. REV. (forthcoming 1998).

62. See *id.*

63. See MARK H. DORFMAN ET AL., ENVIRONMENTAL DIVIDENDS: CUTTING MORE CHEMICAL WASTES 89 (1992).

64. See *American Lung Ass'n v. Browner*, 884 F. Supp. 345, 348 (D. Ariz. 1994) (The EPA has "nullified the congressional scheme" by letting 7 years pass with no revision of particulate standards); Thomas O. McGarity, *Some Thoughts on "Deossifying" the Rulemaking Process*, 41 DUKE L. J. 1385, 1390 (1992); S. REP. NO. 101-228, at 5-6 (1989), reprinted in 1990 U.S.C.A.N. 3385, 3392 ("The Congressional mandate to reissue or revise ambient standards . . . at five year intervals . . . is clearly not being met."). The EPA may consider its most recent revision of the ozone NAAQS to be timely. In 1993, it purported to satisfy the statutory revision mandate by declining to revise the ozone standard or even consider scientific evidence subsequent to "early" 1989. See National Ambient Air Quality Standards for Ozone, 58 Fed. Reg. 13,008, 13,010, 13,016 (1993). Cf. CAA § 109(d), 42 U.S.C. § 7409(d) (requiring "thorough" review of NAAQS and accompanying criteria at five year intervals). Its most recent revision of the ozone NAAQS took place within five years of this 1993 decision. See National

EPA may not be able to respond to new scientific information that should, even under a cost/harm test, produce a revision—especially if the cost and harm estimates become judicially reviewable.

C. *Would A Cost/Harm Test Help the Compliance Effort?*

The Act has succeeded in significantly improving air quality, in spite of a vast increase in car use and prolonged economic growth over more than two-and-a-half decades.⁶⁶ This improvement represents an extraordinary achievement.

Nevertheless, the Act generally has not met its own goal of securing attainment of the NAAQS, at least for ozone and particulate matter.⁶⁷ The material below asks whether cost/harm analysis of proposed NAAQS revisions would improve this situation.⁶⁸

After all, government agencies may consider cost in implementing the NAAQS, i.e., in writing actual emission limitations for particular polluters. Perhaps failing to consider the costs at the outset produces unrealistically stringent ambient standards that agencies are reluctant to satisfy after they evaluate the costs.

This argument principally relies upon a verbal trick rather than sound analysis. If these standards are not met, simply redefining them brings about more congruity between the revised standard and the states' failed implementation of the previous standard. But this redefinition does not make the air any cleaner, nor does it necessarily increase the likelihood that governments will meet the less stringent standards. Relaxing the ambient standards simply redefines dirty air as acceptable air.

It is unlikely that adopting less stringent goals will yield a more vigorous clean-up response. When the Act comes up for reauthorization,

Ambient Air Quality Standards for Ozone, 62 Fed. Reg. 38,856 (1997) (to be codified at 40 C.F.R. pt. 50).

65. See CAA § 109(d), 42 U.S.C. § 7409(d).

66. See generally Nichols Testimony, *supra* note 18, at 2-3 (since 1970, there has been a 29 percent decrease in emissions, a 99 percent increase in gross domestic product, a 28 percent increase in population, and a 116 percent increase in vehicle miles traveled).

67. See Designation of Areas for Air Quality Planning Purposes, 40 C.F.R. §§ 81.300-81.356 (1997) (listing nonattainment areas); OFFICE OF AIR QUALITY AND STANDARDS, EPA, NATIONAL AIR QUALITY STANDARDS AND EMISSIONS TRENDS REPORT, 1996, 73-74, 112-115 app. A (1998).

68. David Schoenbrod has argued against setting ambitious goals without establishing rules designed to achieve those goals. See David Schoenbrod, *Goals Statutes or Rules Statutes: The Case of the Clean Air Act*, 30 UCLA L. REV. 740 (1983). In 1990, Congress did establish a number of new specific rules designed to facilitate achievement of the goal of clean air. See, e.g., CAA § 182, 42 U.S.C. § 7511a (setting forth plan submissions and requirements for nonattainment areas). A cost/harm test might change the goal, but would not solve any remaining problems of insufficient statutory specificity about how to achieve the NAAQS.

the actual lessons from experience with implementation should be considered.

This history offers rich lessons in the difficulties confronting implementation, lessons that vague discussions of costs and benefits tend to obscure rather than illuminate.⁶⁹ States have generally failed to meet the quantitative reduction targets in the 1990 CAA Amendments or provide control programs designed to meet the old NAAQS.⁷⁰ There is no single explanation for this failure, but the laxness of current ambient standards has played an important role in hindering progress.

Because dirty air travels, states must achieve emission reductions in order for their neighbors to meet the Act's goals. Recognizing this situation, the Act requires states to avoid fouling up their neighbors' clean-up efforts, even if their own air meets the NAAQS.⁷¹

Nevertheless, jurisdictions deemed clean have great difficulty summoning the political will to deliver reductions that appear to solely benefit their neighbors, even when they face relatively low control costs. As a result, many areas that have large emission sources causing transboundary pollution have failed to clean up. The new NAAQS may ameliorate this problem.

The tendency of clean areas not to deliver basic reduction measures undermines the control efforts of areas with dirty air. First, the apparent impossibility of achieving clean air without help from recalcitrant states demoralizes state officials preparing to implement a fairly vigorous control program. Second, state officials in areas not in compliance with the standards may fear that their neighbors' failure to match their control efforts will place their own industry at a disadvantage. Demoralization and fear of competitive disadvantage tend to slow down implementation, even of inexpensive measures. Weakening the ambient standards would exacerbate this problem, since weaker standards would leave more polluters in areas deemed to have complied with the standard. The resolution of this collective action problem depends, not upon cost/harm considerations, but upon finding effective political and legal solutions. The EPA's repeated failure to enforce the Act against the states for over twenty-five years demonstrates that the problem has not been solved.⁷²

69. See generally David M. Driesen, *Five Lessons from the Clean Air Act Implementation*, 14 PACE ENVTL. L. REV. 51 (1996) (evaluating potential improvements of Clean Air Act implementation).

70. See *id.*

71. See CAA § 110(a)(2)(D)(i), 42 U.S.C. § 7410(a)(2)(D)(i).

72. The 1990 CAA Amendments required completed state implementation plans providing for achievement of the old NAAQS by 1993 for moderately polluted areas or 1994 for more severely polluted areas. See CAA § 182(b)(1)(A), (c)(2)(A); 42 U.S.C. § 7511a(b)(1)(A), (c)(2)(A). The Act required sanctions and federal implementation plans in 1995 or 1996 for these

The modern understanding of air pollution transport may make opposition to a uniform health-protective NAAQS, based on a notion that each state should choose the air quality it desires, outmoded scientifically.⁷³ States choosing to meet a lax standard probably preclude other states from choosing to meet a stringent standard. Fortunately, nationally uniform standards do not involve a one-size-fits-all control strategy. States with lower existing pollution levels will need less control to meet a uniform standard than states with higher existing pollution levels;⁷⁴ and all states have significant flexibility in choosing strategies.⁷⁵

Political and social impediments have sometimes made compliance with the NAAQS more costly than necessary. States have resisted the most cost effective programs available because officials fear public rejection of seemingly minor inconveniences.⁷⁶ This situation involves a political and social problem, not a problem of an unattainable NAAQS.

This political problem represents just one example of the underlying political difficulty of constructing sound transportation policy. Historically, growth in vehicle use has set back much of our progress toward clean air. Successful widespread deployment of zero emission vehicles could address this problem and eventually lessen compliance challenges. Unless this effort virtually eliminates emissions, it will be necessary to develop improved transportation strategies that address people's mobility needs more efficiently with less pollution and congestion. This challenge must be financed, but historically, political

failures. See CAA §§ 109(b), 110(c), 42 U.S.C. §§ 7509(b), 7410(c). The EPA has generally not imposed these sanctions and states have consequently remained delinquent. See Memorandum from Mary Nichols, Assistant Administrator for Air and Radiation, EPA, to Regional EPA Administrators at 3 (March 2, 1995) (ELI no. AD-808) (proposing mid-1997 date for attainment demonstrations); Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 60 Fed. Reg. 60,318, 60,322-23 (1997) (to be codified at 40 C.F.R. pt. 52) (noting state failures to meet schedule outlined in March memorandum and extending attainment demonstration deadline to April of 1998). The EPA has authority to impose sanctions or a federal plan immediately after a deadline has been missed, but generally has declined to exercise this authority. See CAA § 110(c), (m), 42 U.S.C. § 7410(c), (m).

73. 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, 60 Fed. Reg. at 60,319-20. Cf. James E. Krier, *The Irrational National Ambient Air Quality Standards: Macro- and Micro-Mistakes*, 22 UCLA L. REV. 323 (1974) (air quality standards should pass a statewide cost-benefit test).

74. Professor Krier stated in 1974 that "one would have to assume that the costs of a given level of pollution and a given level of control are the same across the nation" in order to justify a uniform NAAQS as efficient. Krier, *supra* note 73, at 326. To the extent this idea reflects a belief that uniform standards imply uniform costs or uniform quantities of reduction in each air quality control region, it is simply mistaken.

75. See CAA § 110, 42 U.S.C. § 7410.

76. Cost effective programs include vehicle inspection and maintenance programs that separate emissions testing from auto repair to minimize fraud.

problems and public lifestyle choices have proved at least as important as cost.

Even where inexpensive and effective control options exist, the political system has enormous difficulty in implementing them. For example, there is still almost no regulation of polluting buses and trucks. After more than twenty-five years of CAA implementation, there are still no stringent limitations for nitrogen oxide emissions from electric utilities, a very significant contributor to smog and acid rain, despite a dramatic decrease in the cost of strict control.⁷⁷

Directing additional regulatory attention to polluters' short-term cost concerns at an earlier stage will probably not help resolve implementation problems. Rather, this approach will increase the weight given to the exaggerated cost estimates that turn out to be incorrect when the date for actual implementation arrives. Additionally, this approach will reduce or eliminate pressures to solve problems generated by an extremely inefficient transportation system.

D. *The Congressional Role*

How then should Congress respond to claims that health-protective ambient standards cost "too much?" Congress should not pass the issue on to an administrative agency through promulgation of a cost/harm test, as this action involves abandoning a presumptively sound public goal without adequate reason, creating an unworkable situation for the EPA, and abdicating political responsibility.⁷⁸

If Congress considers overruling a particular NAAQS, it should evaluate past economic experience in making predictions for the future. The EPA has completed a retrospective study estimating that implementation costs of approximately \$523 billion have avoided approximately \$22.2 trillion worth of harm.⁷⁹ These figures leave out many important environmental harms. Congress should examine the history of prior economic claims to evaluate whether they have proven true.

77. See *Utilities: Lower Costs, Tighter NOx Limits Expected To Boost Use of SCR Controls, Group Says*, BNA NAT'L ENV'T DAILY (Dec. 2, 1997). Few states have required emission limitations achievable through selective catalytic reduction, even though costs have fallen to approximately 50 cents per pound of pollution reduced. See *id.* Even fewer have written strict fuel neutral standards for existing pollution sources. See NATURAL RESOURCES DEFENSE COUNCIL ET AL., BENCHMARKING AIR EMISSIONS OF ELECTRIC UTILITY GENERATORS IN THE EASTERN UNITED STATES 24 (1997) (coal burning utilities emit more pollution than gas, oil, and nuclear utilities). The pollution standards do little to discourage burning of dirty coal. *Id.*

78. See *Beyond CBA*, *supra* note 6, at 605-13.

79. See THE BENEFITS AND COSTS OF THE CLEAN AIR ACT, *supra* note 33, at ES-2, ES-8.

Congress should also consider justice issues, not just narrow cost/harm claims. Furthermore, it should never consider overturning such an important decision without having committees with relevant expertise hold full and fair hearings. Recent Congresses have addressed important environmental issues through appropriations riders, i.e., bills hidden in budget documents with the intent to avoid committee hearings and adequate public debate.⁸⁰ If Congress wishes to consider reversing the EPA's standards, then it should ensure that estimates of future economic effects receive substantial public discussion in light of the history of past claims.

The economic dynamics of overruling a NAAQS revision also argue against congressional reversal of a NAAQS revision. A stable health protection goal signals industry that inventions reducing air pollution will find a market sooner or later. While much remains to be done to enhance the stability of environmental regulations for those investing in cleaner methods of meeting society's economic needs, overruling ambient standards would probably prove counterproductive from a dynamic economic perspective.

IV. CONCLUSION

Short-term cost considerations do not need even more emphasis than they currently receive. Health-protective standards may help stimulate needed innovations, overcome failures to implement inexpensive and obvious measures, create jobs, and stimulate efficiency improvements, while greatly reducing the numerous harms dirty air causes. States may appropriately take costs into account in choosing the best compliance strategies.

80. See generally Sandra Beth Zellmer, *Sacrificing Legislative Integrity at the Altar of Appropriations Riders: A Constitutional Crisis*, 21 HARV. ENVTL. L. REV. 457 (1997) (critiquing the use of appropriations riders to implement anti-environmental policies).