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Introduction

Learning lessons from the Clean Air Act (CAA)[1] implementation is important for at least two reasons. First, millions of people need the CAA to succeed in meeting its goals. According to the Environmental Protection Agency (EPA), sixty-two million Americans breathe air that is not safe.[2] Polluted air causes at least 64,000 annual deaths,[3] contributes to respiratory illness and asthma,[4] increases risks of cancer,[5] and may seriously threaten our neurological and reproductive health.[6] Dirty air damages crops, kills trees, ruins lakes and streams, and impairs visibility, even from re-

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1. Clean Air Act (CAA) §§ 101-618, 42 U.S.C. §§ 7401-7671q (1994).

2. *See* Elizabeth B. Thompson & Jayne E. Mardock, *Clean Air at the Crossroads: Progress Made and Challenges Ahead*, CLEAN AIR NETWORK (NRDC, Washington, D.C.), Nov. 1995, at 1.

3. This figure is very conservative. It reflects the number of deaths attributable solely to particulate pollution. *See* NATURAL RESOURCES DEFENSE COUNCIL, BREATH-TAKING: PREMATURE MORTALITY DUE TO PARTICULATE AIR POLLUTION IN 239 AMERICAN CITIES (1996).

4. *See* 11 RICHARD R. POWELL, POWELL ON REAL PROPERTY ¶ 865.5A at 79A-299 (Patrick J. Rohan ed., 1994) (hereinafter POWELL). This paragraph in POWELL ON REAL PROPERTY was revised by David Driesen. *See id.* at 79A-271; NATIONAL RESEARCH COUNCIL, RETHINKING THE OZONE PROBLEM IN URBAN AND REGIONAL AIR POLLUTION 31-38 (1991).

5. *See* POWELL, *supra* note 4, ¶ 865.5A[4], at 79A-321.

6. *See generally* THEO COLBURN ET AL., OUR STOLEN FUTURE (1996); H.R. REP. No. 101-490, pt. 1, at 154 (1990).

mote mountaintops.[7] We must learn lessons from the CAA implementation to make sure that we realize the CAA's goals of protecting the environment and public health.

Second, the CAA implementation provides lessons in regulatory policies that have relevance for other statutory schemes, especially for other environmental statutes. The CAA Amendments of 1990 (CAAA),[8] use an enormous variety of regulatory approaches to address the ubiquitous and many-faceted problems of air pollution. Ask almost any question about regulatory policy and chances are, experience with the CAA will be helpful in answering the question. Should Congress set emission limitations? Should Congress delegate that task to the EPA or should the states set these limitations? The CAA uses all three approaches: (1) congressional emission limitations for mobile sources (such as cars)[9] and large power plants which emit sulfur dioxide, causing acid rain,[10] (2) EPA set emission limitations for hazardous air emissions from stationary sources (such as factories),[11] and (3) state emission limitations addressing urban smog.[12] How should we go about limiting emissions? The CAA does so by employing[13] technology based standards,[14] health based standards,[15] and emissions trading.[16]

Drawing lessons from the CAA implementation requires some caveats. First, although the 1990 CAAA provide for substantial pollution reduction by 1995,[17] the CAA requires

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7. *See* POWELL, *supra* note 4, ¶ 865.5A[2][e][ii],[5], at 79A-299; Graig N. Oren, *Prevention of Significant Deterioration: Control Compelling Versus Site Shifting*, 74 IOWA L. REV. 1 (1988).

8. Clean Air Act Amendments of 1990 (CAAA), Pub.L. 101-549, 104 Stat. 2399 (1990).

9. *See* CAA § 202(g)-(h), 42 U.S.C. § 7521(g)-(h).

10. *See id.* § 404 42 U.S.C. § 7651c.

11. *See id.* § 121, 42 U.S.C. § 7412.

12. *See id.* §§ 72(c)(1), 182(b)(2), 42 U.S.C. §§ 7502(c)(1), 7511a(b)(2).

13. *See* POWELL, *supra* note 4, ¶ 865.5A[9][c], at 79A-330.20(18).

14. *See, e.g.*, CAA § 112(d), 42 U.S.C. § 7412(d).

15. *See, e.g.*, Natural Resources Defense Council v. EPA, 22 F.3d 1125 (D.C. Cir. 1994); 42 U.S.C. § 7412(f).

16. *See, e.g.*, POWELL, *supra* note 4, ¶ 865.5A[5], at 79A-329.

17. *See, e.g.*, CAA §§ 112(e)(1), 182, 42 U.S.C. §§ 7412(e)(1), 7511a.

reductions through the year 2010,[18] so the lessons we draw must be tentative. Second, since we lack good emissions monitoring data in many instances, we cannot precisely measure the success of implemented programs. We can, however, distinguish between programs that are being carried out as designed and programs that are floundering. In addition, we do have some monitoring of pollution levels for some pollutants. Third, a large variety of factors influence implementation including congressional and presidential politics, actions of both polluters and environmentalists, funding levels for government agencies with implementation responsibilities, the weather, and last (and at times, least) the law. This makes learning lessons complicated.

Below, I draw five lessons from our implementation experience to date.

Lesson One: When Congress Makes Detailed Decisions to Reduce Emissions, We Get Progress

The CAA's most successful programs, the program to phase-out ozone depleting chemicals, the program to limit sulfur dioxide emissions from acid rain, and the program to limit mobile source emissions, all feature detailed congressionally set emissions limitations.[19] These programs use a variety of approaches: a phase-out of ozone depleting chemicals, emissions trading of sulfur dioxide allowances, and straightforward limitations on tailpipe emissions. Regardless of which approach is used, in every case where Congress has established emissions limitations, these limitations generate substantial reductions in pollution.

By contrast, the CAA's program to limit hazardous air pollution delegates the authority to set emissions limitations to the EPA.[20] This program has had only modest success, and that success stems from statutory provisions requiring the EPA to implement a broad program according to a de-

18. *See id.* §§ 181(a)(1), 112(e)-(f), 42 U.S.C. §§ 7511(a)(1), 7412(e)-(f).
19. *See id.* §§ 202(g), 404(e), 604, 42 U.S.C. §§ 7521(g), 7651c(e), 7671c.
20. *See id.* § 112, 42 U.S.C. § 7412.

tailed statutory timetable.[21] The toxics program has not enjoyed as much success as the programs where Congress wrote the emissions limitations themselves.

The EPA has historically written its rules late and then authorized illegally long delays in implementation.[22] Since the 1990 CAAA contain detailed deadlines for a large number of regulations, coupled with a "backstop provision" that subjects every source that should have been regulated to the individual permitting if the EPA fails to act, the EPA has written more regulations than ever (albeit belatedly).[23] Because these regulations are numerous, typically demand some reductions, and address such a broad group of air pollution sources, the last five years' of regulations will produce more emission reductions than the previous two decades of EPA effort in this area. However, most of these regulations stop short of requiring all sources of pollution to even meet the levels they can meet using widely available and proven 1970s and 1980s technology.[24] In addition, certain EPA regulations will have little or no effect in some communities because they represent steps backward, relative to the better

21. *See id.* §112 (a),(c),(e), 42 U.S.C. § 7412 (a),(c),(e).

22. The Clean Air Act requires EPA to promulgate regulations addressing forty categories of air pollution sources by 1992. *See* CAA §112; 42 U.S.C. § 7412(e)(1). But the EPA's first hazardous air pollution rules fulfilling this obligation came out years later. The EPA promulgated a final rule addressing emissions from synthetic chemical manufacturing almost two years late and continued to amend it through 1996, almost four years after the statutory deadline. *See* Direct Final Rule, 61 Fed. Reg. 7716 (1996); Final Rule for Synthetic Chemical Manufacturing, 59 Fed. Reg. 19,402 (1994). With respect to Petroleum Refineries, the EPA promulgated final rules in 1994 and it allowed some polluters to comply long after the statutory compliance deadline. *See* 60 Fed. Reg. 43,244, 43,247 (1995) (allowing compliance up to 10 years after promulgation) *cf.* CAA § 112, 42 U.S.C. § 7412(d)(10),(i)(3) (requiring compliance within three years of promulgation with a one year extension available under some circumstances).

By contrast the EPA has moved rapidly to implement the law where Congress itself set the emission standards. *See, e.g.,* Final Rule Implementing New Light Duty Vehicle Standards, 56 Fed. Reg. 25,724 (1991).

23. *See* CAA § 112, 42 U.S.C. § 7412(j).

24. For example, the petroleum refinery rule required no reductions at all from wastewater systems because the EPA declined to regulate sources of wastewater that it had not regulated in the past within petroleum refineries. *See* 60 Fed. Reg. at 43,246 (1995).

efforts of state agencies addressing toxics. Indeed, they may even lead to increased emissions in communities with very large toxics problems.[25] The requirement that the EPA write these regulations and that they provide for the maximum achievable reductions, while not wholly successful, has produced more progress than we had prior to 1990 when debates about the value of pursuing reductions usually supplanted actual work on reducing emissions.

The lesson here is that congressional decisions to mandate broad reductions are very important and congressional decisions specifying how much reduction and by whom are even more important. Ironically, much of the regulatory reform effort seems devoted to abandoning congressional decision-making in this area. Instead of mandating reductions, Congress would mandate a cost-benefit analysis if these bills became law.[26] This would return us to a situation worse than that which existed prior to the 1990 CAAA. Its prolonged debate about the costs and benefits of reductions in hazardous air pollutants (HAPs) usually supplanted actions that would actually reduce emissions and improve public health.[27]

Lesson Two: We Need to Better Enforce State Obligations to Reduce Air Emissions

While progress has occurred, many states simply have not implemented most of the programs that the CAA requires. Implementation failures have been most prominent in Title I of the CAA, the Urban Smog Title. Absent strong consistent enforcement of the states' obligations to provide emissions reductions, the states have and will continue to substitute the usual litany of excuses for not making the tough choices required by the CAA. States do not want to place themselves at a competitive disadvantage by regulating

25. The author has examined the plans for several large facilities in Louisiana which plan (basing this on the exemptions in federal standards) to increase emissions from what state law might otherwise require.

26. *See, e.g.*, The Comprehensive Regulatory Reform Act of 1995, S. 343, 104th Cong. § 623 (1995).

27. *See generally* H.R. REP. No. 101-490, pt. 1, at 322 (1990); POWELL, *supra* note 4, ¶ 865.5A[4], at 79A-321.

aggressively while its neighbors get away with not implementing the CAA. Since air quality modeling does not offer precise answers to exactly what package of reductions will work best, one can always delay by citing the need for more air quality modeling. As the EPA fails to enforce the obligations of the most recalcitrant states obligation to actually deliver clean air, the better ones feel undermined and progress slows across the board.

If states fail to act, the EPA is supposed to withhold highway funds or sanction the state by imposing federal restrictions on new sources.[28] The EPA, in practice, violates the law regularly in order to avoid these politically difficult actions.[29] It may be worth thinking about a system that rewards states for doing well instead of depending on politically difficult punishment of those states who do badly. The states would not receive highway monies unless, and until, they met CAA obligations. States that met or exceeded the CAA's requirements would win that money. Non-performing states would have to rely on state rather than federal funds. The current system creates a kind of state entitlement to highway monies which the EPA must withdraw in the case of non-compliance. This entitlement seems terribly out of place in the 1990s. In the meantime, though, the EPA must re-establish its credibility by consistently and regularly enforcing the CAA, politically difficult as this may be. Absent enforcement, we simply will not get clean air.

Lesson Three: Emissions Trading Can Work Well When Coupled with Strict Rules and Stringent Monitoring

In 1990, Congress limited each large power plant's sulfur dioxide emissions and created an emissions trading program

28. *See* CAA § 179, 42 U.S.C. § 7509.

29. *See, e.g.*, Memorandum from Mary Nichols, Assistant Administrator for Air and Radiation to Regional Administrators (Mar. 2, 1995)(authorizing delay in submitting a plan to meet air quality standards until 1997); *cf.* CAA § 181; 42 U.S.C.§ 7511a(c)(2)(A),(d),(e) (requiring serious severe and extreme areas to submit attainment plans by November 15, 1994).

based on these limitations.[30] Under this Acid Rain Trading Program, a power plant may emit more than Congress allows, but only if it purchases additional allowances from a plant that emits less than Congress allows.

We are now in the first phase of a multi-phased trading program, so we do not yet know whether the program has succeeded. The recent decision to turn off acid rain monitors in the Adirondack Mountains may make it impossible to know whether this program ultimately succeeds in protecting the environment. Early indications suggest that more reductions will be needed.

Many environmentalists, however, predict that this program will prove successful in at least realizing its own substantial emission reduction goals. Here are some of the reasons. First, this program, unlike previous failed programs, relies on continuous monitoring of actual emissions.[31] Unless the EPA's budget cuts prevent it from checking the monitoring data, utilities will not be able to justify increased emissions with reductions that only occurred on paper. Second, Congress set emissions limitations that provide for substantial reductions. Third, the rules do not seem to create opportunities for gaming, a problem that has bedeviled previous EPA programs providing for trading between pollution sources. We know that utilities operating under this program have reduced emissions at a tiny fraction of the costs projected when Congress created this program in 1990.[32]

While the *Zeitgeist*[33] leads many to conclude that emissions trading produces these cheap emission reductions, the data does not support that conclusion. In fact, little trading

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30. *See* POWELL, *supra* note 4.

31. *See* CAA § 412, 42 U.S.C. § 7651k.

32. *See* Martha M. Hamilton, *Selling Pollution Rights Cuts the Cost of Cleaner Air*, WASHINGTON POST, Aug. 24, 1994, at F1. (utilities estimated that acid rain reductions would cost $1500 per ton during debate on 1990 Amendments to the Clean Air Act); *Comment & Analysis: An Innovation Gets Airborne*, FINANCIAL TIMES, May 6, 1996 at 17, (allowances now selling for $68.00 a ton).

33. "The taste and outlook characteristic of a period or generation." AMERICAN HERITAGE DICTIONARY 1405 (2nd ed. 1982).

has occurred.[34] This suggests either that the EPA and industry simply exaggerated the cost of reductions when Congress debated the 1990 CAAA or that companies can lower their costs when faced with an affirmative obligation to meet a numerical limit. The reductions have generally involved no substantial innovation, but instead, an application of well known and understood techniques.[35]

So far, experience suggests the lesson that well designed emissions trading programs are worthwhile, not because they lower costs or stimulate innovation, but because of their ability to overcome political resistance to stringent emissions limitations on industry by reducing the fear of high costs.[36] The EPA has encouraged state emissions trading programs under Title I, the Urban Smog Title. This program may duplicate the failures of the 1980s, instead of using the lessons of the 1990s about how to achieve success. Programs that do not require reliable monitoring and eliminate the numerous gaming opportunities that may arise, will solve a political problem for the agencies, but they will do little or nothing to protect the environment. Where reliable monitoring exists or where equitable problems with redistributing pollution are too great (for example, one cannot justify increasing some people's cancer risk by pointing to overall declines in atmosphere loadings), the EPA must learn to "just say no" to trading.

Lesson Four: EPA Needs More Political Independence

It may be time for us to recognize that environmental problems will require a politically independent agency devoted to solving them. The EPA is not such an agency. Many

34. *See* Casey Bukro, *Smoke Trading is Thin; Emission Credits Produce Little Heat*, CHICAGO TRIBUNE, Feb. 6, 1995, at C1. The little trading that has occurred may have lowered compliance costs for the purchasers of credits. But the volume of trades has been so low that trading cannot explain the low costs. *Id.*

35. These techniques consist chiefly of the use of low sulfur coal or scrubbers.

36. It is possible that trading will pick up during phase two, when the program demands more stringent reductions. But this does not indicate that the low costs to date stem from trading.

of the implementation problems stem directly from political pressure on the EPA. In particular, the EPA needs insulation from short term pressures to violate the law, coming from Congress, the Office of Management and Budget (OMB), and the President.

OMB pressure has played a prominent role in the EPA's failures. Pressure from the Bush White House led to an illegal initial permit rule and unnecessary delay and uncertainty in the program.[37] The initial permit program is crucial because, without an operating permit which collects the various emissions limitations that apply to a facility, which applies stringent monitoring requirements, and which describes how a facility will comply, nobody has a ready way of determining whether a plant is in compliance or not.[38] While an independent EPA would be subject to pressures by polluters trying to evade potential liability for non-compliance, an independent EPA would be more likely to respond to those pressures on their merits rather than allow itself to be bludgeoned into violating the law.

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37. The operating permit rule conflicts with section 502 of the Act, which requires, *inter alia*, an opportunity for hearing and public comments when permits are revised. *Compare* CAA § 502; 42 U.S.C. § 7661a(b)(6) *with* 40 C.F.R. § 70.7(e)(2)(h) (1992); Final Operating Permit Rule, 57 Fed. Reg. 32,250, 280-89 (1992). The original rule did not explicitly limit the emissions that might be revised through so-called minor permit modifications, a procedure not involving public comment. Instead, the EPA did exclude certain emission increasing activities from minor modification eligibility, but it apparently allowed emissions increases that qualified as "minor new source review modifications," and increases not amounting to a modification under section 112(g) of the Act, without seeking a permit revision requiring an opportunity for public participation. *See* Operating Permits Program, Proposed Rule, 59 Fed. Reg. 44,460, 44,462-63 (1994). In response to litigation, EPA has proposed amendments to many sections of the rules alleged to be illegal. *See id.*; 60 Fed. Reg. 45,530 (1995); *see also Chafee Voices Concern About CAA Permit Plan Allowing Excess Emissions*, INSIDE EPA, May 3, 1991, at 8; *Waxman Lambastes EPA CAA Permit Proposal in Follow-up Hearing*, INSIDE EPA, May 24, 1991, at 13; *Bush Curbs Clean Air Provision*, WASHINGTON POST, May 17, 1992, at A-1.

38. *See* James Miskiewicsz and John S. Rudd, *Civil and Criminal Enforcement of the Clean Air Act After the 1990 Amendments*, 9 PACE ENVTL. L. REV. 281 (1992); William F. Pedersen, Jr., *Why the Clean Air Act Works Badly*, 129 U. PA. L. REV. 1059, 1071-93 (1981); POWELL, *supra* note 4, ¶ 865.5A[7] at 79A-330.14.

While the problems in the permit program stem primarily from the Bush Administration, politicization of implementation is a bipartisan problem. President Clinton undermined the EPA enforcement of the Enhanced Vehicle Inspection and Maintenance Program (I&M), one of the simplest and cheapest ways to realize large emission reductions, at a critical juncture by not enforcing the program in California, an important electoral state.[39] Congressional pressure has pushed the EPA into further backtracking on this program among others. The Clinton Administration has also continued to allow the OMB to oversee the EPA rulemaking, thus continuing the Republican tradition of undermining implementation.[40]

In other areas, where short term political pressures could prevent an agency from carrying out important long-term missions in a consistent manner, we insulate the agency from political pressures from elected officials through devices other than modifications in the law. Maybe we should look at models like the Federal Reserve Board and think about long term appointments for the heads of the EPA with limited removal authority.

Lesson V: Environmental Protection Generates Employment

The fifth lesson is that environmental protection usually tends to generate employment. Much of the data for this observation actually predates the 1990 CAAA, but writers have

39. Early in President Clinton's first term, most states had moved forward in adopting enhanced vehicle inspection and maintenance programs meeting the EPA's requirements under the 1990 Amendments. These programs separate the testing from the repair of vehicles and enhance the testing equipment to assure that vehicles with excess emissions are identified and repaired properly. California, however, was refusing to adopt the required program. EPA threatened to impose sanctions. But EPA reneged on this threat, apparently because of White House pressure. EPA subsequently undermined the better states by negotiating a deal to accept a California program that seemed not to comply with the rule. Subsequently, most states that had planned to adopt a separation of test and repair dropped these programs.

40. *See* Exec. Order No. 12,866, 3 C.F.R. 638, 649 (1994), *reprinted in* 5 U.S.C. § 601 (1994).

recently been pulling the newer data together.[41] Environmental protection tends to generate blue collar employment, which may explain why employers resist stringent environmental protection.[42] Some companies would much rather fire their workers and enjoy larger profits than hire more workers to run an environmentally excellent business. Data from the late 1980s shows that the number of layoffs caused by environmental protection is less than one-tenth of one percent of all large scale layoffs from that period.[43] Mergers, however, were a leading cause of unemployment, as they seem to be today.[44] Overall, environmental protection has generated a small net increase in jobs.

Conclusion

In sum, the experience of CAA implementation, to date, suggests that specific congressional decisions help clean the air, that better enforcement of state obligations is needed, that emissions trading probably can work well when coupled with stringent monitoring and game proof rules (but not otherwise), that the EPA needs more political independence, and that environmental protection generates employment. These simple lessons may have relevance beyond the CAA.

While these lessons are simple, responding appropriately to these lessons is very difficult. Even if we were focused on learning from our experience in order to better clean the air, we would have a set of formidable political and intellectual challenges to meet to translate these lessons into practice.

Unfortunately, the so-called "regulatory reform" debate in Washington, which drives implementation to some degree, does not focus on the real lessons that one can draw from actual experience. Indeed, many of the "regulatory reform" proposals would interfere with duplication of recent successes

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

42. *See id.* at 1.

43. *See id.*

44. *See id.* at 14 (ownership changes accounted for 40 times more layoffs than environmental protection costs).

and promote duplication of previous failures. This is unfortunate.