Book Review

Regulatory Reform at EPA: Separating Fact from Illusion

Reforming Air Pollution Regulation: The Toil and Trouble of EPA's Bubble, by Richard A. Liroff.* Washington, D.C.: The Conservation Foundation, 1986. 186 pages. $16.50.

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Much of the environmental legislation administered by the U.S. Environmental Protection Agency (EPA) pays little attention to the costs of imposing various standards on industry. Indeed, it would be fair to say that the majority of this legislation was drafted with the philosophy that environmental objectives should dominate cost concerns.[1] The basic philosophy underlying the writing of standards was the "command-and-control" approach. Using this approach, federal and state regulators promulgated rules which directed companies to use a particular technology to meet a prescribed emission standard. Firms were provided very little latitude in choosing alternatives to meet specific standards. Economists were quick to point out that this "command-and-control" method of regulation was quite expensive. Indeed, they performed a number of simulation studies which indicated that dramatic cost savings could be achieved by allowing firms more flexibility in meeting standards.[2]

Over the last decade, in response to these and other criticisms, EPA has begun to experiment with a variety of reform measures aimed at providing companies with greater flexibility in the technologies they can choose

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1. For a critique of some of the rationales underlying the Clean Air Act and the problems related to a total disregard for costs, see Krier, *The Irrational National Air Quality Standards: Macro- and Micro-Mistakes*, 22 U.C.L.A. L. REV. 323 (1974).

2. For an excellent summary of the literature, see T. TIETENBERG, EMISSIONS TRADING: AN EXERCISE IN REFORMING POLLUTION POLICY (1985).

to meet environmental standards.[3] The most ambitious and far-reaching of these reforms is the emissions trading policy which allows companies to trade emission rights under certain conditions and thereby provides additional mechanisms for companies and states to work together to meet ambient standards[4] set forth in the Clean Air Act.[5] The basic rationale for adopting this new approach is its potential to save a great deal of money without sacrificing air quality objectives. For EPA, the policy represents a radical departure from the dominant command-and-control paradigm.

The emissions trading policy has been characterized by EPA Administrator Lee Thomas as "one of EPA's most impressive accomplishments."[6] However, not everyone shares the Administrator's optimistic view. The emissions trading policy has been the subject of heated, and sometimes acrimonious, debate. Environmentalists are concerned that progress towards meeting environmental quality objectives may be slowed,[7] while proponents of market-based approaches to pollution problems argue that this reform does not go far enough.[8] Most of the arguments to date are based on rather vague, anecdotal impressions of the performance of the emissions trading policy. Notably absent from the debate is a reasoned assessment of actual program performance.

Richard Liroff's book, *Reforming Air Pollution Regulation: The Toil and Trouble of EPA's Bubble* represents a major contribution to the evaluation of regulatory reform at EPA precisely because it takes an in-depth look at how specific aspects of emissions trading were implemented. Well-written and easily accessible, the book should be of interest to a wide

3. For example, a market was established in 1982 for the exchange of rights to include lead in gasoline. *See* 47 Fed. Reg. 49,331 (1982) (codified in scattered sections of 40 C.F.R. pt. 80).

4. "Ambient standards specify permissible concentrations of pollutants in an area's air. These standards are distinguishable from emission standards, which govern the amount of pollution allowed from particular points." R. LIROFF, REFORMING AIR POLLUTION REGULATION: THE TOIL AND TROUBLE OF EPA'S BUBBLE 6n (1986) [hereinafter by page number]. *See generally* R. STEWART & J. KRIER, ENVIRONMENTAL LAW AND POLICY (1978).

5. Clean Air Act Amendments of 1977, Pub. L. No. 95-95, 91 Stat. 685 (codified as amended in scattered sections of 42 U.S.C.). *See generally*, R. Hahn & G. Hester, Where Did all the Markets Go?: An Analysis of EPA's Emissions Trading Program 14 (Oct. 20, 1986) (on file with the *Yale Journal on Regulation*) ("The elements of emissions trading have been, at various points in time, added on to the existing regulatory system, revised, disallowed as a result of legal challenges, and resurrected.").

6. L. Thomas, EPA Administrator, Memorandum re: Final Emissions Trading Policy 2 (undated memorandum attached to Administrator's Decisions/Guidance to Staff Emissions Trading (Bubble) Issues, U.S. Environmental Protection Agency, May 19, 1986) (on file with author) [hereinafter cited as Memorandum].

7. *See, e.g.*, p. 2 (quoting Doniger, *The Dark Side of the Bubble*, ENVTL. F., July, 1985, at 33); pp. 15, 98 (citing undated letter to Natural Resources Defense Council members from NRDC Executive Director John Adams).

8. *See, e.g.*, Hahn and Noll, *Implementing Tradable Emissions Permits*, in REFORMING SOCIAL REGULATION: ALTERNATIVE PUBLIC POLICY STRATEGIES 125 (L. Graymer & F. Thompson eds. 1982).

audience, including policy makers, reformers, and academics interested in alternatives to command-and-control regulation.

I. An Overview of the Book

Liroff explains how the Clean Air Act and emissions trading actually work by examining the laws and regulations and their implementation. He also shows why emissions trading has been the subject of a great deal of controversy. His exploration of the motivations of key actors and interest groups provides an explanation for the highly polarized nature of the discussion.

Liroff's review of the Clean Air Act raises several issues which have an impact on the efficacy of emissions trading. In particular, he discusses the distinction between new and old sources,[9] the problems with developing emissions inventories,[10] and the use of modeling and analytical techniques to demonstrate that progress will be made toward achieving ambient standards.[11] He also provides an insightful description of the four basic elements that make up the emissions trading policy: bubbles,[12] banking,[13] offsets,[14] and netting.[15]

The heart of Liroff's analysis is built on an in-depth study of the first of these four elements—EPA's bubble policy. The bubble policy allows a firm to treat an entire, multi-source facility as if it were a single source.[16] The name is derived from the concept of a "bubble" enclosing the whole facility. The result of the bubble is to allow the multi-source facility greater flexibility in meeting emissions standards by providing an incentive for firms to identify less expensive ways of achieving an aggregate level of emissions which does not exceed the sum of emission limits for individual sources within the bubble.[17] Specifically, Liroff carefully reviews about one-third of the approximately forty bubbles which EPA has proposed for approval.[18]

A mixed picture emerges from Liroff's analysis of bubble policy.[19] On the one hand, based on reports of participating firms, the cost savings

9. Pp. 35-60, 61-103, 105-34.
10. Pp. 10, 20.
11. Pp. 17, 28-29, 61-99.
12. Pp. 4 *passim*.
13. P. 7.
14. Pp. 6-7.
15. Pp. 6, 117-34.
16. In this review, the term multi-source refers to sources with more than one emission point within a plant.
17. P. 4.
18. Pp. 62-103.
19. Pp. xvi-xvii, 97-103 (summaries of effect of bubble policy).

resulting from bubbles have been impressive,[20] and the effect on environmental quality appears to have been small.[21] Some bubbles have sped pollution abatement, producing reductions in emissions faster than would have occurred in response to conventional control requirements.[22] On the other hand, other bubbles used credits for reducing emissions which were obtained from plant closures that would have occurred anyway,[23] or from past responses to conventional control requirements.[24] Interestingly, the bubble policy appears to have resulted in little technological innovation.[25]

Given the large reduction in pollution control costs and the small impact on environmental quality, one might wonder why the bubble policy generates such controversy. Liroff's book provides a cogent description of the political interests involved in shaping the evolution of emissions trading policy. The roles of different groups within and outside the agency are examined, and Liroff offers a framework for understanding varying attitudes. Environmentalists, he argues, oppose emissions trading because they believe it will slow environmental progress.[26] They tend to feel more comfortable applying command-and-control approaches which provide less flexibility over a company's choice of control equipment.[27] Groups opposed to the command-and-control philosophy, however, argue that alternative systems can achieve the best of both worlds—a cleaner environment at a lower cost.[28]

As one might expect, industry and environmentalists find themselves battling over these issues in court. Accordingly, another central actor in the evolution of emissions trading policy has been the court system. Key judicial decisions involving emissions trading have served to increase the uncertainty associated with the definition of the property rights that can be traded.[29] Liroff's analysis of the court's role in defining emissions trading provides insight into the forces which generate these conflicts.

20. The number most frequently cited for cost savings from bubbles is $800 million. P. 62 (quoting *EPA Emissions Trading Status Report* 1 (1985)). It is difficult to place error bounds on this number, but Liroff's analysis of individual cases supports the view that the cost savings have been substantial P. 99. For a more comprehensive review of the cost savings resulting from emissions trading activities, see R. Hahn & G. Hester, *supra* note 5, at 20, 22.

21. *See generally* pp. xvi-xvii, 98-102 (evaluations of Liroff's case studies).

22. Pp. xvii, 100.

23. Pp. 98-99, 102.

The issue of plant closure has been controversial because it has sparked the debate over who owns the property right, and what the appropriate duration of that right should be.

24. Pp. xvi-xvii, 98-99.

25. Pp. xvii, 100.

26. Pp. 2, 15, 98-99.

27. Pp. 11-13 (discussing various approaches to emissions trading).

28. *Id.*

29. In turn, the agency has tended to de-emphasize the explicit nature of the property right. *See infra* text accompanying note 47. For an overview of important court decisions, see pp. 26-27.

The principal strength of the book is its concern with the way the world really works as opposed to some theoretical ideal. Just as it is important to point out the strengths and deficiencies of command-and-control regulation, it is also important to point out the relative merits of alternative reforms as they are applied in practice. Liroff's analysis of the bubble policy provides the best description to date of how the program actually works.

After studying a particular set of policies in detail, it is always tempting to end with a proposal or series of proposals for reforming the policy in question. This book is no exception. The final chapter outlines a proposal for modifying emissions trading.[30] This is perhaps the weakest point of the book, not because the proposal is necessarily flawed, but rather because the presentation fails to sensitize the reader to the fact that reform proposals for this particular policy will vary dramatically depending upon the objectives that are viewed as desirable. For example, a reform aimed at reducing pollution control expenditures while maintaining environmental quality would look quite different from a reform aimed at avoiding any degradation in environmental quality that might result from introducing greater flexibility in the system. While Liroff considers a single reform with a specific orientation, it is also important to identify the range of possible reforms.

The primary elements of Liroff's reform proposal include: (1) tightening trading rules;[31] (2) developing better data on the likely performance of state programs aimed at meeting ambient standards;[32] (3) performing periodic evaluations of trading activities at the state level;[33] (4) instituting a "truth in trading" program that would provide information on actual environmental impacts;[34] (5) introducing limited trading for new and modified sources;[35] and (6) improving emissions inventories and emissions monitoring.[36]

While this is a well-crafted proposal, it is by no means the only way to proceed. Elements 1 and 4 of Liroff's proposal would place further limitations on trading by changing the rules governing transactions and raising the costs of trading. Unfortunately, the rationale behind introducing significant additional safeguards to ensure that each trade will result in an emissions decrease appears to be strained. Liroff's empirical analysis

30. Pp. 135-45.
31. Pp. 136-39.
32. Pp. 140-41.
33. Pp. 140-41.
34. Pp. 141-42.
35. P. 143.
36. Pp. 143-44.

indicates that emissions increases have been the exception rather than the rule in the case of bubbles.[37] Moreover, he does not believe that netting has resulted in major changes in environmental quality.[38] The only apparent rationale for imposing more stringent environmental safeguards is to increase the credibility of the program with environmentalists.[39]

Elements 2, 3, and 6 of Liroff's proposal would provide better information on the scope and impact of trading activities. Liroff's call for additional information is well-founded. The central focus of his analysis is on the federal bubble policy. However, an independent study reveals that bubbles are probably one of the smaller elements in emissions trading.[40] The primary reason the bubble program receives so much attention is because data are routinely collected on some bubbles at the federal level. Elements 2 and 6 of Liroff's proposal are also fairly standard proposals for gaining a better understanding of how well states are meeting air quality objectives. Because this is where activity takes place, an understanding of the state and local role in air quality regulation is important for designing and evaluating reform proposals.

The only element of the proposal aimed at increasing flexibility is number 5. Introducing limited trading for new and modified sources is likely to have a salutary impact on pollution control expenditures without leading to major changes in environmental quality.

II. Whither Regulatory Reform?

It is important to recognize that proposals to reform emissions trading inevitably involve tradeoffs and constraints. At a general level, emissions trading affects both environmental quality and the individual and aggregate cost of achieving different emission levels. There is an implicit tradeoff between reducing costs and improving environmental quality. This is not to say that both goals cannot be furthered; however, at some point, the two will come into conflict with each other. Moreover, in designing a system where the actual effects are uncertain and information about the various program elements is quite limited, it makes sense to view these tradeoffs in probabilistic terms.[41]

37. *See generally* pp. 61-103 (discussion of implementation of bubble policy and its effect on emissions).

38. *But see* pp. 121-23 (discussing a less certain evaluation of netting on attainment areas). For a discussion of nonattainment areas, see p. 133.

39. Pp. 136-44 (discussing improvements in the program that increase the program's credibility).

40. *See* R. Hahn & G. Hester, *supra* note 5, at 33.

41. Suppose for example, that the effects of a policy are measured in terms of their impact on costs and environmental quality. Then one can characterize the impacts of this policy in terms of a probability distribution over costs and environmental quality.

Rather than study a particular reform, as Liroff did, it is useful to examine a variety of reform proposals, some of which are more likely to promote environmental objectives, and others which focus more on providing companies with incentives to achieve cost savings.[42] Given the current structure of emissions trading, it may even be possible to design reforms which have a high probability of achieving significant cost savings and increasing environmental quality.[43] In addition to designing reform proposals that have an immediate impact, it is important to explore reform proposals that would enable us to learn about the full potential of emissions trading for reducing costs and improving environmental quality. Such a proposal could include experimentation in a limited geographic area for a single pollutant, placing minimal restrictions on trading, while still promoting environmental quality.[44]

As Liroff recognizes, understanding the theoretical scope for policy design is important; however, it is equally important to have a good grasp of the political constraints imposed on program design. Analysts schooled in focusing on policy outcomes tend to reduce the causes of the conflict to a battle over measurable results, such as cost and environmental quality. However, Liroff's analysis reveals that the issues are not so straightforward, and involve fundamental differences in values over process as well as outcome.[45] These differences ultimately impose additional constraints on the policy process. Because there are major differences in the perspectives of important interest groups, the emissions trading policy represents a fascinating case study in politics.

Political reaction to the policy has been decidedly mixed. Environmentalists have tended to be skeptical of emissions trading policy, arguing that environmental quality objectives have been sacrificed in the name of economic efficiency. They assert that the program merely serves as another loophole for industry to evade regulations. However, there is a deeper sense in which environmentalists oppose reforms of this type. A

42. The most recent draft of the EPA emission policy falls into the former category. *See* Memorandum, *supra* note 6. Hahn & Hester have developed an alternative proposal which falls into the latter category. Hahn & Hester, *supra* note 5, at 64. For a review of both of these proposals along with a more detailed analysis of Liroff's proposal, see *id.* at 58.

43. One approach which could reduce costs while promoting environmental quality is to reduce some of the uncertainties for firms engaging in emissions trading while, at the same time, improving the information which provides the baseline from which Emission Reduction Credits (ERCs) are calculated. For example, improvements in data on actual emissions could simultaneously reduce some of the uncertainty for firms about their potential to create emission reduction credits, and decrease the probability that firms will use credits which are based on unrealistic estimates of emissions.

44. Hahn & Noll, *Designing a Market for Tradable Emissions*, in REFORM OF ENVIRONMENTAL REGULATION 119 (W. Magat ed. 1982) (examining some issues in designing such a proposal in context of specific pollution problem.

45. For a penetrating discussion of these issues see S. KELMAN, WHAT PRICE INCENTIVES?: ECONOMISTS AND THE ENVIRONMENT (1981).

fundamental premise underlying emissions trading is that explicit trading of emissions rights is an acceptable activity. This is not a premise which many environmentalists will accept, even if it can be shown that such activity will lead to substantial improvements in environmental quality. The reasons for this resistance are complex. For some, it is an issue of morality—clean air is viewed as a basic inalienable right which is not for sale at any price. Even for those who do not view this moral position as absolute, there is an important symbolic issue at stake: Allowing firms to trade emission rights sends a message that decisions about tradeoffs between economics and environmental quality can be left to the polluters. As a result of these concerns, environmentalists tend to view emissions trading as a radical departure from the status quo.

In contrast, for advocates of more flexible approaches—most notably economists—the emissions trading policy represents an incremental reform. When measured in terms of its potential relative to a smoothly functioning market in emissions rights, the cost savings from emissions trading have been small.[46]

These conflicting views have led regulators to create a set of policies which are specifically designed to de-emphasize the explicit nature of the property right.[47] As a consequence, most transactions in the emissions trading program involve trades between emissions sources within a single company. Arms-length trades between firms are the exception rather than the rule.[48]

One key interest group absent from the preceding discussion is "industry." What interests does industry have? It is generally assumed that industry wishes to reduce its expenditures on environmental controls. Less widely recognized is the fact that industry also has a strong preference for greater certainty in environmental regulation. Thus, the reduction in costs that can be achieved under emissions trading policies may not be worth the additional uncertainty that is created by participating in the program. While sweeping generalities of this type are always suspect, it is possible to observe industry behavior under the emissions trading program.[49] It is clear from such observations that compliance deadlines are a prime motivator in getting industry to use emissions trading options.[50] This

46. R. Hahn & G. Hester, *supra* note 5, at 53 (providing further support for this view based on low level of trading between firms).

47. For a discussion of the judicial role in interpreting this policy, see *supra* text accompanying note 29.

48. More trades between different companies would imply greater cost savings and lower barriers to starting new businesses and expanding old ones. Their implications for environmental quality are unclear.

49. R. Hahn & G. Hester, *supra* note 5, at 16.

50. *Id.* at 31.

suggests a model of behavior in which businesses are not likely to explore new regulatory alternatives unless they are in a situation where a change from the status quo is inevitable. The conventional mechanism for changing the status quo is to introduce new regulatory requirements along with a compliance deadline. However, a deadline may not, in itself, be sufficient to induce a change in behavior. Firms must also believe that the regulations will be enforced in a timely manner. If firms do not believe that a regulation has "teeth," they will be less inclined to comply with the deadline.[51]

While Liroff's case study of the bubble policy underscores the potential and limitations of regulatory reform, it also serves as a good example of how little we know about the nature of environmental reforms aimed at increasing efficiency. In the case of emissions trading, there is precious little information on which to evaluate the performance of the program. If EPA is interested in gaining a balanced picture of the effects of innovative policies, it needs to collect information on all four elements of emissions trading—bubbles, banking, offsets, and netting. Before making sweeping proposals for regulatory reform, it behooves us to have at least a vague understanding of the overall performance of each of the different elements of the emissions trading program. Liroff explains the evolution and structure of these elements, but with the exception of the bubble, only provides a cursory review of their performance.

At present, information is systematically collected only for bubbles, while netting, banking, and offset policies for emissions trading have received less attention. Placing primary emphasis on bubbles, however, can provide a misleading picture of the scope for regulatory reform. Netting, which involves trading with modified sources, appears to have been used much more frequently than bubbles, which involves trading with existing sources.[52] Netting has probably resulted in much higher cost savings to firms than bubbles.[53] The environmental impact of netting, however, is probably small.[54] Recent work highlights the need to improve the quality and quantity of information that is centrally collected in order to make a

51. During the tenure of Administrator Burford at EPA, there were many allegations that enforcement activity was severely curtailed. If this were the only change, then one would expect to see a corresponding drop in emissions trading activity. However, if the environmental standards for emissions trading activity were also relaxed during this period, then this would have had a salutary impact on trading activity. For a general discussion of problems in compliance during this period, see W. DRAYTON, AMERICA'S TOXIC PROTECTION GAP, (1984).

52. R. Hahn & G. Hester, *supra* note 5, at 51.

53. *Id.*

54. *Id.* at 41-42.

reasoned assessment of the actual effect these programs have on environmental quality and cost savings.[55]

Another constructive area for study which EPA might wish to explore is how differences in the administration of programs affect outcomes. There are dramatic differences in the implementation of the various programs in terms of federal oversight. It is an open question as to how the division of responsibility between federal, state, and local authorities affects the evolution and performance of programs. One of the reasons the bubble policy may be less active than the netting policy is because states and local authorities have more control over netting. Bubbles generally require federal oversight whereas netting does not.

One fruitful approach for gaining insights into the effect of giving states greater autonomy is to examine the "generic bubble policy." Under the existing bubble policy, states have two options. If they do not submit a set of formal rules accepted by EPA for approving bubbles, they must revise and resubmit their formal plan for meeting ambient standards each time a bubble is proposed to EPA for approval.[56] If they do submit formal rules which are approved by EPA, they can approve bubbles without going through the EPA review process each time.[57] Bubbles approved under state rules are commonly called "generic bubbles." The principal advantage of generic bubbles is that they reduce the level of administrative red tape by reducing federal oversight. The level of bubble activity is significantly higher in states with generic bubbles.[58] It would be useful to know how bubbles with required federal oversight compare to bubbles approved by states which permit generic bubbles, in terms of their effect on environmental quality and cost savings.

Conclusion

Emissions trading is likely to remain a controversial issue. Much of the controversy stems from fundamental differences about the nature of property rights. Economists have tended to view the property rights issue too simplistically. While it is possible to reduce the issue to differences in expectations of how various programs will affect environmental quality and costs, this does not, in my view, adequately capture some of the concerns of environmentalists. Allowing emission rights to enter more directly into the domain of market activity can and does affect their "intrinsic" value to different groups, as well as their monetary value. While this

55. *See* R. Hahn & G. Hester, *supra* note 5.
56. Emissions Trading Policy Statement, 47 Fed. Reg. 15,076, 15,086 (1982).
57. *Id.* at 15,084.
58. R. Hahn & G. Hester, *supra* note 5, at 32.

poses some difficult measurement problems for welfare economists, it helps to explain the widespread resistance we have seen to the use of more flexible approaches in achieving environmental objectives.

A key contribution of Richard Liroff's book is that it describes and explains a particularly important regulatory reform. It should provide a fertile base from which to build more effective reform proposals. An important challenge for future research is to begin to synthesize these findings in an effort to understand better why particular reforms are chosen in specific situations and how they are likely to perform.[59] *Reforming Air Pollution Regulation: The Toil and Trouble of EPA's Bubble* represents one of the first contributions toward developing some of these insights.

59. There are a wide array of incentive-based institutions that have recently been adopted in several industrialized nations. The introduction of these reforms provides researchers with a unique opportunity to examine how these policies compare, and in particular, to develop theories on why some policies have been effective while others have not.