



Summer 2000

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Recommended Citation

Dale B. Thompson, *Political Obstacles to the Implementation of Emissions Markets: Lessons from RECLAIM*, 40 Nat. Resources J. 645 (2000).

Available at: <https://digitalrepository.unm.edu/nrj/vol40/iss3/6>

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Political Obstacles to the Implementation of Emissions Markets: Lessons from RECLAIM

ABSTRACT

Why have so few emissions markets been implemented? This article addresses this question by examining the political economy of the Regional Clean Air Market (RECLAIM) for Los Angeles. RECLAIM offers an excellent opportunity to study the political obstacles of emissions markets, because its nitrogen oxides and sulfur oxides component was implemented while its volatile organic compounds component was not. By carefully analyzing the decisions of the regulatory agency responsible for RECLAIM, this article offers a precise explanation of the political obstacles faced by an emissions market like RECLAIM. These obstacles include the difficulty in extending markets to sources and products that were previously unregulated under a command-and-control regime. Also, political conflict arising because of uncertainty is more contentious under emissions markets than under command-and-control regulation. This article then offers suggestions for improving the political feasibility of emissions markets.

I. INTRODUCTION

Economists have frequently recommended the use of emissions markets to reduce air pollution.¹ They cite the cost advantages of markets

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1. See generally J.H. DALES, POLLUTION, PROPERTY, AND PRICES (1968); THOMAS H. TIETENBERG, EMISSIONS TRADING (1985); Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea?*, 18 ECOLOGY L.Q. 1, 8-10 (1991).

over traditional command-and-control approaches, together with the strong incentive that markets would promote technological change. With these advantages, we might expect that emissions markets would be widely used. However, very few markets have actually been implemented, with the Acid Rain market being the most notable exception.² Drawing on our experience with the REgional CLean Air Market (RECLAIM) in Los Angeles, this article identifies two general obstacles to the widespread adoption of emissions markets. The first is the difficulty in extending markets to sources and products that were previously unregulated under a command-and-control (CAC) regime. Second, political conflict arising because of uncertainty is more contentious under emissions markets than under CAC.

Prior articles fail to offer an adequate explanation for the lack of implementation of emissions markets. Part of this literature is a debate between emissions markets advocates and advocates of command-and-control (CAC).³ Many environmental groups, though not all,⁴ have sided with the CAC advocates, but the opposition of these groups is an inadequate explanation for the low number of emissions markets. Another portion of the literature has examined the need to design a market with low transaction costs and well-defined property rights.⁵ However, if the savings

2. Actual emissions markets in the United States include the EPA Emissions Trading program involving Bubbles and Netting, the Lead (in gasoline) Trading program, the Chlorofluorocarbon (CFC) program under the Montreal Protocol, the Acid Rain program, and RECLAIM. For analysis of the Emissions Trading program, see generally Richard Stewart, *Economics, Environment, and the Limits of Legal Control*, 9 HARV. ENVTL. L. REV. 1 (1985); Robert W. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program*, 6 YALE J. ON REG. 109 (1989). For the Lead Trading program, see generally Robert W. Hahn, *Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders*, 3 J. ECON. PERSP. 95 (1989). For the CFC program, see generally Robert H. Hahn & Albert McGartland, *The Political Economy of Instrument Choice: An Examination of the U.S. Role in Implementing the Montreal Protocol*, 83 NW. U. L. REV. 592 (1989). For the Acid Rain program, see generally Paul L. Joskow et al., *The Market for Sulfur Dioxide Emissions*, 88 AM. ECON. REV. 669 (1998).

3. For market advocates, see for example, Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); Robert H. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program*, 6 YALE J. ON REG. 109 (1989). For CAC advocates, see Howard Latin, *Ideal versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN. L. REV. 1267 (1985).

4. The Environmental Defense Fund is the most notable exception. See Robert W. Hahn, *United States Environmental Policy: Past, Present and Future*, 34 NAT. RESOURCES J. 305, 332 (1994).

5. See, e.g., Vivien Foster & Robert W. Hahn, *Designing More Efficient Markets: Lessons from Los Angeles Smog Control*, 38 J.L. & ECON. 19, 44 (1995); Robert W. Hahn, *Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders*, 3 J. ECON. PERSP. 95, 110 (1989); Robert W. Hahn & Gordon L. Hester, *Marketable Permits: Lessons for*

from emissions markets are truly as great as has been claimed, these difficulties should be overcome.

Even articles focusing on the political economy of emissions markets do not offer a sufficient explanation for the lack of implementation of these markets. Some articles examine the political economy of how permits are allocated in an established emissions market.⁶ However, these articles do not examine the political economy of barriers to the implementation of emissions markets.

Other articles suggest that the political opposition of affected industries can be overcome through "grandfathering" mechanisms. Neoclassical economic theory suggests we will see large efficiency gains from adopting an incentive-based instrument such as an emissions market, rather than using CAC. A politician can then redistribute these gains to ensure a "Pareto-improving" outcome, where all parties are better off. This redistribution of the efficiency gains makes it likely that competition among interest groups will improve the efficiency of regulations⁷ by adopting an instrument like an emissions market.

With emissions markets, this redistribution is accomplished through a grandfathering mechanism. Under a grandfathering mechanism, permits are given, at no cost, to prior emitters based on historical emissions. When this is done, affected industries maintain the entitlement to pollute that they have had under CAC regimes. They should therefore be no worse off under an emissions market than under a CAC regime, because they could then continue operating as before, using the permits that have been given to them. This is in contrast to emission tax schemes where the affected industries have to purchase the entitlement to pollute.⁸ Our experience with markets suggests that these grandfathering mechanisms are important in securing the political support of the affected regulated industries.⁹ Through grandfathering's redistribution of the large gains available through the use of emissions markets, we thus should be

Theory and Practice, 16 *ECOLOGY L.Q.* 361, 363 (1989); ROBERT N. STAVINS & ROBERT W. HAHN, *TRADING IN GREENHOUSE PERMITS: A CRITICAL EXAMINATION OF DESIGN AND IMPLEMENTATION ISSUES* (Harvard John F. Kennedy School of Government Working Paper No. R93-15, 1993).

6. See generally Paul L. Joskow & Richard Schmalensee, *The Political Economy of Market-Based Environmental Policy: The U.S. Acid Rain Program*, 41 *J.L. & ECON.* 37 (1998); Karl Hausker, *The Politics and Economics of Auction Design in the Market for Sulfur Dioxide Pollution*, 11 *J. POL'Y ANALYSIS & MGMT.* 19 (1995).

7. See Gary S. Becker, *A Theory of Competition among Pressure Groups for Political Influence*, 98 *Q.J. ECON.* 371, 373 (1983).

8. See James Buchanan & Gordon Tolluck, *Polluters Profits and Political Response: Direct Controls versus Taxes*, 65 *AM. ECON. REV.* 139, 140 (1975).

9. See Robert H. Hahn & Albert McGartland, *The Political Economy of Instrument Choice: An Examination of the U.S. Role in Implementing the Montreal Protocol*, 83 *NW. U.L. REV.* 592, 606 (1989).

able to achieve the political acceptability of an emissions market. However, very few emissions markets have been implemented. Concerns by affected industries over loss of their entitlement to pollute are, therefore, also not an adequate explanation for the lack of implementation of markets.

Some articles do mention possible political obstacles to emissions markets presented by regulators and the regulated entities.¹⁰ These discussions derive from lessons suggested by public choice theory.¹¹ Public choice theory suggests that there are political barriers presented by organized interest groups that have a strong incentive to maintain the status quo.¹² Regulators have an incentive to maintain the status quo because a CAC system requires active management by these bureaucrats.¹³ Meanwhile, industrial groups may also prefer a CAC system because it can reduce entry and thereby limit competition.¹⁴ They also may prefer their more certain understanding of how a CAC system might operate in the future to the uncertain operation of an emissions market.¹⁵ However, these theories have been drawn from our experience with the CAC regulatory system, not from an investigation of an actual emissions market proposal. One article by Nathaniel Keohane, Richard Revesz, and Robert Stavins¹⁶ does offer a framework for examining the political economy of instrument choice in environmental policy. However, their ultimate conclusions on the lack of implementation of emissions markets frequently echo the conclusions based on public choice theories. They point to the support of command-and-control regimes by existing firms, because their ability to limit entry generates rents,¹⁷ and also to the opposition of environmental groups to incentive-based instruments. They do offer some more novel explanations concerning the advantages that command-and-control instruments offer legislators. The most interesting of these is the notion that command-and-control instruments offer significant degrees of flexibility in their relative impacts on different interest groups. This flexibility simplifies

10. See, e.g., Barton H. Thompson, Jr., *The Search for Regulatory Alternatives*, 15 STAN. ENVTL. L.J. 8, 17-18 (1996).

11. For a good discussion of public choice theory and its application to environmental regulation, see Jonathan B. Wiener, *On the Political Economy of Global Environmental Regulation*, 87 GEO. L.J. 749 (1999).

12. See, e.g., BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR 116-28 (1981); Robert Crandall, *Economic Rents as a Barrier to Deregulation*, 6 CATO J. 173, 192-93 (1986).

13. See Gordon Brady et al., *Political Limits of the Market for BAT Medallions*, 14 REG. 61, 63-64 (1990).

14. See Crandall *supra* note 12, at 173.

15. See Brady et al., *supra* note 13, at 63-64.

16. See Nathaniel Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313 (1998).

17. Recall that limiting entry lessens competition. With less competition, existing firms can generate rents through higher profits.

the formation of majority coalitions necessary to enact these instruments. Nevertheless, while incentive-based instruments may not be as flexible, the substantial efficiency gains offered by these instruments should also be sufficient to establish the necessary majority coalitions. Because the obstacles noted by these and other authors can be overcome, other factors must be preventing the implementation of these markets.

This article takes a more thorough approach to examining the barriers to the implementation of an emissions market. It suggests that political obstacles presented by affected producers and consumers are the primary impediments to the widespread use of emissions markets. This is true even when these markets distribute permits on a grandfathered basis, and the affected facilities are not charged for these permits. This article develops these conclusions through examining the political economy of the RECLAIM emissions market for Southern California, which was undertaken by the South Coast Air Quality Management District (SCAQMD or the District). RECLAIM presents an interesting opportunity for examining impediments to the implementation of emissions markets. One portion of RECLAIM, for nitrogen oxides (NO_x) and sulfur oxides (SO_x), was implemented while another, for volatile organic compounds (VOC), was not. By comparing these two case studies arising from RECLAIM, this article draws analytical conclusions on the political obstacles to emissions markets.

The conclusions drawn from RECLAIM suggest that the public choice explanation of maintaining the status quo, as discussed above, is not a sufficient explanation for the small number of implemented emissions markets. In RECLAIM, we find that regulators will support the creation of an emissions market, and regulated industries, under certain circumstances, will also support the creation of an emissions market. In RECLAIM, we also see that the opposition of environmental groups to emissions markets is an insufficient explanation. Closer inspection of our experience with RECLAIM suggests a more complicated explanation of political obstacles to emissions markets.

One obstacle arises because of the inadequacy of the grandfathering mechanism. Some groups will receive allocations of grandfathered permits, and those groups may then support the implementation of the market. However, frequently there will be other groups in the chain of production and consumption of the affected product that do not receive these permits. These groups then may suffer substantial welfare losses from the implementation of an emissions market. This result is in contrast to the neoclassical economic notion that we can make all parties better off by redistributing some of the efficiency gains from adopting an emissions market.

This effect appeared during RECLAIM. Difficulties in enforcement would mean that local drivers and local consumers of products emitting

VOCs would not receive allocations of grandfathered permits. At the same time, inclusion of mobile sources and consumer products within the scope of RECLAIM would result in higher prices for drivers and consumers because the price would reflect the marginal opportunity cost of these permits.¹⁸ Consequently, although inclusion would have been advantageous for organized industrial sources, the District Board apparently feared the possibility that a political entrepreneur might trigger a response by local constituent drivers and consumers, as they instead decided to exclude mobile sources and consumer products from the scope of RECLAIM.¹⁹ This decision would later have a significant impact on the failure to implement VOC RECLAIM, because VOC RECLAIM would have been more attractive to businesses if these other sources were included. This experience suggests that difficulties in compensating all affected parties may present a political obstacle to the further implementation of emissions markets.

Another obstacle arose because of uncertain technological change. Prior authors have examined the effects of uncertainty on the efficiency of emissions markets.²⁰ Uncertainty plays a new role in this case, a political role. For RECLAIM, the method of determining allocations of future permits depended upon estimation of future technologies and their corresponding emissions rates.²¹ This estimate was fairly easy for the NO_x/SO_x market, because the District had already adopted technological rules for NO_x and SO_x sources with future implementation dates.²² No such rules existed for VOC sources. This led to a significant conflict in the determination of future allocations for VOC RECLAIM.

While there will always be disagreements between industry and regulators concerning future technologies to reduce emissions, there are significant differences in the consequences of these disagreements under an emissions market versus under CAC. Under CAC, an escape valve exists for over-optimistic projections: if the expected technology does not develop, the rule itself can be reevaluated. However, under an emissions market, the emissions cap is much tighter: if the technology implied in the

18. As will be discussed later, these permits have opportunity costs because they can be sold to firms emitting these pollutants.

19. See S. COAST AIR QUALITY MANAGEMENT DIST., RECLAIM, FEASIBILITY STUDY SUMMARY: SUMMARY RECOMMENDATIONS 2-1 to 2-2 (1992) [hereinafter FEASIBILITY SUMMARY RECOMMENDATIONS]; S. Coast Air Quality Management Dist., I RECLAIM EX-7 (1994) [hereinafter RECLAIM VOL. I].

20. See generally Martin Weitzman, *Prices vs. Quantities*, 41 REV. ECON. STUD. 477 (1974); Marc J. Roberts & Michael Spence, *Effluent Charges and Licenses under Uncertainty*, 5 J. PUB. ECON. 193 (1976); Richard V. Butler & Michael D. Maher, *The Control of Externalities in a Growing Urban Economy*, 20 ECON. INQUIRY 155 (1982).

21. See RECLAIM VOL. I, *supra* note 19, at EX-8.

22. See, e.g., *id.* at 5-15 to 5-16 tbl.5-2 (listing District Rules A-C-05, P-B-01, P-B-02, P-B-6, P-C-02, P-C-04 to P-C-08, P-F-01, P-F-02).

allocations does not develop, the sources from the affected industry will be expected to purchase excess permits from other sources. No reallocation based on the failed development of the technology will occur. This concern was a significant factor in the political opposition of industrial sources to the ultimate VOC RECLAIM proposal, and this opposition then doomed the implementation of VOC RECLAIM.²³ Thus, we see that uncertain technological change can also create significant political obstacles to the implementation of an emissions market.

These lessons suggest that before we attempt to implement an emissions market, we should be concerned with more than debates posed by environmental groups and design problems concerning transaction costs and the definition of property rights. Also, the prospective economic benefits offered by emissions markets will not be the sole determinant of whether these reforms will be politically feasible. Instead, we must search for effects that may lead to the political opposition of producers and consumers of products affected by the implementation of an emissions market. These effects include the possibility that some groups may suffer substantial welfare losses from the implementation of a market or the uncertainty of technological change. These concerns must be addressed, or the political acceptability of an emissions market will remain in doubt.

This article looks at the political obstacles that affected the implementation of emissions markets in the Los Angeles Basin and uses the lessons from that experience to suggest future political strategies in emissions market implementation. Part II provides some background on the regulation of air quality in Los Angeles, and then part III offers an overview of the history of the RECLAIM program. Part IV offers a political economy model to understand the decisions of the political regulators responsible for RECLAIM. It then analyzes the decisions affecting the implementation of NO_x/SO_x RECLAIM, and the failure to implement VOC RECLAIM. Part V examines the political obstacles faced by RECLAIM, and finally, part VI offers some conclusions and suggestions to improve the political feasibility of an emissions market proposal.

II. PRIOR AIR QUALITY REGULATIONS IN LOS ANGELES

Air quality in the Los Angeles Basin²⁴ is significantly affected by emissions of nitrogen oxides (NO_x), sulfur oxides (SO_x), and volatile organic compounds (VOC). NO_x and SO_x emissions are generated by

23. See REGULATORY FLEXIBILITY GROUP, *THE OPEN MARKET ALTERNATIVE TO VOC RECLAIM* 11-16 (1996).

24. The Los Angeles Basin includes the counties of Los Angeles, San Bernardino, Orange, and Riverside.

small facilities operating boilers and engines, large permitted facilities, and mobile sources. Regulation of small facilities is accomplished by regulating the fuel used by the boilers. Large facilities (those emitting more than four tons per year) have been tightly regulated through the use of source-specific rules passed by the SCAQMD.²⁵

There are approximately 400 large NO_x facilities and 40 large SO_x facilities in the district.²⁶ Electric utilities and oil refineries generate much of the emissions from these large facilities.²⁷ The entire group of large facilities was responsible for 93 tons per day of emissions of NO_x and 20 tons per day of SO_x during 1990, out of a total of 217 NO_x tons per day and 38 SO_x tons per day for all stationary sources in the Basin.²⁸

VOCs are emitted by larger permitted facilities, smaller permitted facilities, mobile sources, and very small, non-permitted stationary area sources.²⁹ There are some source-specific regulations for permitted facilities, including Rule 1102: Petroleum Solvent Dry Cleaners; Rule 1115: Motor Vehicle Assembly Line Coating Operations; Rule 1124: Aerospace Assembly and Component Manufacturing Operations; Rule 1125: Metal Container, Closure, and Coil Coating Operations; Rule 1141: Control of VOC Emissions from Resin Manufacturing; Rule 1164: Semiconductor Manufacturing; Rule 1168: Control of VOC Emissions from Adhesive Application; and Rule 1171: Solvent Cleaning Operations.³⁰

Within these particular rules, stricter regulations, involving more advanced technologies and more extensive monitoring, were generally applied to larger scale facilities.

Stationary area sources of VOCs included individual consumers using products that emitted VOCs, such as aerosols or hairspray. These sources were essentially unregulated under the prior CAC regime. In 1990, stationary area sources were responsible for approximately 409 tons per day of VOC emissions and large permitted sources were responsible for approximately 53 tons per day.³¹

25. For instance, electric utilities were tightly regulated under Rule 1135, "Emissions of Oxides of Nitrogen from Electric Power Generating Systems," and refineries under Rule 1109, "Emissions of Oxides of Nitrogen from Boilers and Process Heaters in Petroleum Refineries."

26. See RECLAIM VOL. I, *supra* note 19, at EX-3.

27. See *id.* at apps.I-B-1, I-B-2.

28. See S. COAST AIR QUALITY MANAGEMENT DIST., 1994 AIR QUALITY MANAGEMENT PLAN 3-6 tbl.3-2A (1994) [hereinafter 1994 AQMP].

29. See *id.*

30. See generally S. COAST AIR QUALITY MANAGEMENT DIST., 2 RULES AND REGULATIONS (1994) [hereinafter RULES AND REGULATIONS].

31. See 1994 AQMP, *supra* note 28, at 3-6 tbl.3-2A.

In the late 1980s and early 1990s, two pieces of legislation were passed that required the SCAQMD to significantly improve air quality for the Los Angeles Basin. One piece of legislation was the California Clean Air Act (California CAA).³² This act required five percent per year reductions in nonattainment pollutants, including NO_x, SO_x, and VOCs for the Los Angeles Basin.³³ Soon thereafter, the amendments to the federal Clean Air Act (federal CAA) were passed.³⁴ These amendments identified the Los Angeles Basin as an "extreme" nonattainment zone,³⁵ and consequently required the District to develop a plan to substantially improve air quality.³⁶ In particular, it required that every three years, beginning in 1991, the District would have to submit a plan that contains inventories of actual emissions of nonattainment pollutants during the previous year, and describe the rules it would adopt to reduce those emissions.³⁷ These inventories would include both stationary and mobile sources.³⁸ Under Section 182(c)(2), future inventories would have to show reductions in VOC emissions of three percent per year.³⁹ Also, under Section 182(b)(1)(A), the District must actually achieve national ambient air quality standards for ozone by the year 2010.⁴⁰ In order to do this, as determined by the District, emissions of VOCs would have to be reduced by approximately seven percent per year.⁴¹

While the federal CAA required these significant reductions, in Section 182(g)(4) it also enabled affected regions to use economic incentive programs in order to achieve these reductions.⁴² One economic incentive program would be a cap-and-trade emissions market. In a cap-and-trade emissions market, a total emissions level is specified, and then permits adding up to this level are distributed to sources. The sources can emit only as much emissions as the quantity of their permits allow. If they have more,

32. California Clean Air Act of 1988, 1988 Cal. Adv. Legis. Serv. 1568 (Deering) (codified in scattered sections of California Health & Safety Code).

33. See CAL. HEALTH & SAFETY CODE § 40914 (West 1996); see also RECLAIM VOL. I, *supra* note 19, at EX-20.

34. See Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399, 2399-2712 (codified at 42 U.S.C. §§ 7401-7671q (1994)).

35. See *id.* at § 178 (defining nonattainment).

36. See *id.* at § 172 (describing nonattainment plans in general).

37. See generally *id.* at § 182 (describing nonattainment plans in greater detail for Marginal, Moderate, Serious, Severe and Extreme Areas).

38. See *id.*

39. See *id.* at § 182(c)(2).

40. See generally *id.* at § 182.

41. See 1994 AQMP, *supra* note 28, at 5-10 tbl.5-2.

42. See Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399, 2399-2712 § 182(g)(4) (codified at 42 U.S.C. § 7511a (1994)).

they can sell excess permits. If they wish to emit more than allowed by their permits, they must purchase unused permits from other sources.

This environmental policy instrument is very different from the instrument typically used: command-and-control regulation. In CAC regulation, sources are issued permits that are based on the use of certain emissions-reduction technologies. One source is not allowed to trade permits with other sources. Under the federal CAA, an economic-incentive-based instrument such as an emissions market would be allowed as long as it achieved equivalent air quality measures as a command-and-control regime.⁴³

III. AN OVERVIEW OF THE HISTORY OF THE RECLAIM PROGRAM

Faced with these air quality problems, the regulatory body responsible for air quality in the Los Angeles Basin, the South Coast Air Quality Management District (SCAQMD), needed to create a management plan that would state how they would achieve their particular air quality objectives. The traditional approach to achieve these objectives was through command-and-control regulations. However, the severe nature of the problem facing the District forced them to consider a more radical approach. It looked into implementing a market-based program to improve air quality: a tradable emissions permit market called the REgional CLean Air Market or RECLAIM. If this program did not succeed, the District would be forced to instead implement traditional command-and-control rulemaking, involving substantially tighter controls.

The RECLAIM program was an ambitious undertaking. Prior emissions markets (lead in gasoline, chlorofluorocarbons, the Acid Rain program addressing electric utilities) were all addressed to highly regulated pollutants and sources. For RECLAIM, while sources of NO_x and SO_x were closely regulated, regulation of permitted sources of VOC was much less extensive. And regulation of stationary area sources like consumer products⁴⁴ was virtually non-existent. RECLAIM was thus an ambitious attempt to extend air quality control to sources and products beyond what had been attempted under command-and-control regulation.

When it began developing this program, District staff envisioned two principal advantages to adopting an emissions market.⁴⁵ One would be the substantial reduction in costs for the affected industries. The other

43. See RECLAIM VOL. I, *supra* note 19, at EX-20 to EX-21.

44. Consumer products include paints, solvents, deodorants, hairspray, and many other items.

45. See RECLAIM VOL. I, *supra* note 19, at EX-2 to EX-5.

was a significant reduction in the costs of operating the regulatory regime for the District. The process of writing new regulations for all of the appropriate sources and products is lengthy and complicated. The process of creating a market for emissions permits, while not simple, would enable significant savings in staff time, which the District could then reallocate to other pollutants and to enforcement. Because of these advantages, the District staff was very supportive of the development of an emissions market to achieve the reductions in emissions required under the clean air acts.⁴⁶ This support is contrary to the public choice theory that regulators themselves might wish to maintain the status quo of CAC regulation.

The process of developing RECLAIM began with a series of workshops in 1990 and 1991 that explored the use of markets to improve air quality.⁴⁷ In these initial workshops, consultants to the district presented the broad outline for a plan to develop an emissions market to address these air quality concerns.⁴⁸ These consultants recommended that the scope of this emissions market be as broad as possible, including stationary point sources, consumer products, solvent activities, and mobile sources.⁴⁹

In February 1991, after these workshops, the District Board asked District staff to conduct a Feasibility Study to examine different designs for the RECLAIM program.⁵⁰ At the same time, a Steering Committee and an Advisory Committee were created, with representatives from industry, environmental, public health, and ethnic groups, along with representatives from public agencies.⁵¹ In conjunction with these committees, District staff generated five working papers, along with a Feasibility Study Summary: Summary Recommendations document in March 1992.⁵² In this document, it was recommended that the scope of the RECLAIM market include neither consumer products nor mobile sources at that time.⁵³ After a public hearing, the District Board approved this Recommendations Document, and decided to proceed with the development of rules for RECLAIM.⁵⁴

After the decision to proceed, the two committees met with District staff to develop rules for establishing an emissions trading program for

46. See *id.* at EX-1 to EX-2.

47. See *id.* at EX-6.

48. See, e.g., DAVID HARRISON & ALBERT NICHOLS, MARKET-BASED APPROACHES TO REDUCE THE COST OF CLEAN AIR IN CALIFORNIA'S SOUTH COAST BASIN 50 (1990).

49. See *id.*

50. See RECLAIM VOL. I, *supra* note 19, at EX-6 to EX-7.

51. See *id.*

52. See *id.* at EX-6.

53. See FEASIBILITY SUMMARY RECOMMENDATIONS, *supra* note 19, at 2-1 to 2-2; RECLAIM VOL. I, *supra* note 19 at EX-7.

54. See RECLAIM VOL. I, *supra* note 19 at EX-7.

three pollutants: nitrogen oxides (NO_x), sulfur oxides (SO_x), and volatile organic compounds (VOCs).⁵⁵ They recognized the difficulty of establishing trading programs for all three pollutants at the same time.⁵⁶ The VOC program required significant further study to determine appropriate allocations and rules for monitoring and enforcement. Consequently, in February 1993, the District officially bifurcated the emissions market into a NO_x/SO_x program and a VOC program and decided to address the VOC program later.⁵⁷ Because of this delay in the VOC program, the District began developing new command-and-control rules for VOCs.⁵⁸

The NO_x/SO_x program was, thus, addressed first. The District proposed a specific emissions trading program for NO_x and SO_x, and released the first draft of rules in November 1992.⁵⁹ The development of these proposals was aided significantly by the existence of previously adopted rules for NO_x and SO_x, with future implementation dates. After submitting this draft and subsequent revisions to public workshops, the final draft was presented in July 1993.⁶⁰ The business community liked this proposal because it used activity levels from non-recessionary years (pre-1990) to determine starting allocations.⁶¹ They also substantially agreed with the emissions reduction factors used to calculate future allocations.⁶² Environmental and public health groups did not like this proposal because initial allocations were much higher than recent actual emissions.⁶³ Nevertheless, because the program met the objectives of the Air Quality Management Plan (AQMP) and the affected businesses supported it, the board of the District approved this proposal in October 1993.⁶⁴

The emissions program for NO_x and SO_x then began operating in January 1994.⁶⁵ Throughout 1994 and in early 1995 little trading occurred.

55. See *id.* at EX-6 to EX-7.

56. See *id.* at EX-6.

57. See *id.*

58. See *id.*

59. See *id.* at 1-4.

60. See *id.*

61. See Telephone Interview with Robert Wyman, Partner, Latham & Watkins (Mar. 18, 1996).

62. See *id.*

63. See Comment Letter #4 from Gail Ruderman Feuer, Senior Staff Attorney Natural Resources Defense Council, et. al. to James M. Lents, Executive Officer, South Coast Air Quality Management District (Sept. 7, 1993), reprinted in S. COAST AIR QUALITY MANAGEMENT DIST., III RECLAIM app.III-I (1994) [hereinafter RECLAIM VOL. III].

64. See RECLAIM VOL. I, *supra* note 19, at 1-4.

65. See *id.*

However, beginning in late 1995, a significant number of emissions credits were traded.⁶⁶ This emissions market is now fairly active.⁶⁷

Throughout the implementation of the NO_x/SO_x program, discussions on the VOC program continued. A variety of technical and political difficulties arose when the committees attempted to determine how to properly include consumer products in an emissions market for VOCs.

Another development that occurred was the release of data on actual emissions of VOCs during the recessionary years. This data was collected as part of the 1994 AQMP, and was for the year 1993. This data showed a dramatic decrease in VOC emissions.⁶⁸ Under Section 182(c), future AQMPs would have to show improvements in future reported actual emissions as compared to these 1993 emission levels.⁶⁹

In May 1995, District staff released the first draft of proposed rules for VOC RECLAIM and again held public workshops.⁷⁰ In contrast to the case of NO_x and SO_x, there were no previously adopted VOC rules with future implementation dates to guide them. Consequently, the initial proposal included rough guesses to calculate emissions factors.⁷¹ Industry groups disagreed strongly with these estimates and protested that they had no support.⁷² The District officers then conducted a Technology Assessment study.⁷³ This was done to determine more precisely what reductions in VOC emissions credits would achieve equivalency with implementation of Best Available Retrofit Control Technology required under the California CAA.⁷⁴ This study then served as the basis for emission factors in the next proposal, which was released in November 1995.⁷⁵ Further revisions to allocations were proposed in January 1996, after District staff released a revised Technology Assessment.⁷⁶

66. See South Coast Air Quality Management District, *Annual RECLAIM Audit Report for the 1996 Compliance Year* (visited June 4, 2000) <<http://www.aqmd.gov/hb/980342a.html>>.

67. See *id.*

68. See S. Coast Air Quality Management Dist., Steering Committee Meeting (Dec. 5, 1995) (Slide: VOC RECLAIM Allocations vs. Reported Emissions on file with author).

69. See Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399, 2399-2712 § 182(c) (codified at 42 U.S.C. § 7511a (1994)).

70. See XUAN VU ET AL., S. COAST AIR QUALITY MANAGEMENT DIST., 1 RECLAIM FOR VOLATILE ORGANIC COMPOUNDS EX-6 (1995).

71. See *id.*

72. See Telephone Interview with Robert Wyman, *supra* note 61.

73. See VU ET AL., *supra* note 70, at EX-6.

74. See RECLAIM VOL. I, *supra* note 19, at EX-21.

75. See VU ET AL., *supra* note 70, at EX-6.

76. See SURESH CHAURUSHIYA ET AL., S. COAST AIR QUALITY MANAGEMENT DIST., TECHNOLOGY REVIEW FOR ADHESIVES, COATINGS, INKS, AND SOLVENTS 1-1 to 1-2 (1996).

Business groups did not like this proposal because it used recessionary activity levels to determine individual businesses' allocations.⁷⁷ These groups also disagreed with the implied predictions of future technologies that would enable sharp decreases in future emissions.⁷⁸ Environmental and public health interest groups also did not like this proposal because they felt that it allowed emissions of too much VOCs because of the way allocations were calculated.⁷⁹

At a public hearing in January 1996, following the latest revisions to allocations, both large and small business groups declared their opposition to VOC RECLAIM.⁸⁰ The District Board then voted to kill the VOC RECLAIM program the following week.⁸¹

IV. EXAMINATION OF THE DECISIONS CONCERNING RECLAIM

This history suggests that there were three critical points where decisions were made that affected the ultimate success of implementing NO_x/SO_x RECLAIM and the ultimate failure of implementing VOC RECLAIM. This article will now examine each of these decisions more carefully.

A. A Political Economy Model of Decision Making by the District Board

In examining these decisions, the article will explain the decision of the SCAQMD Board through a political economy model. In this model, members of the District Board are politicians, whose principal purpose is to be reelected. In fact, the District Board was primarily composed of local politicians: some were members of the local counties' boards of commissioners, others were members of local city councils, and the remaining member was an appointee by the governor of California. The District Board can thus be understood to be a group of political regulators.

A variety of interest groups influences decisions about the scope of regulation and choice of instrument.⁸² These groups influence political regulators through the provision or withholding of votes, contributions, or

77. See REGULATORY FLEXIBILITY GROUP, *THE OPEN MARKET ALTERNATIVE TO VOC RECLAIM 6* (1996).

78. See *id.* at 8.

79. See generally Gail Ruderman Feuer et. al., *Comments on the May 9, 1995 Proposed VOC RECLAIM Rules and Proposed Amended Rules 2011, 2012* (July 6, 1995) (unpublished manuscript, on file with author).

80. See Telephone Interview with Robert Wyman, *supra* note 61.

81. See *id.*

82. Possible instruments include taxes, permits, regulation, no action, and others.

both. There are four sets of interest groups: environmental and public health groups, consumers, drivers, and businesses. Some of these groups may be affected by what is known as "representation bias." Representation bias is the notion that politicians may disfavor the interest groups outside their jurisdiction.⁸³

Consumers and drivers may also be "rationally ignorant."⁸⁴ A single vote in most elections has very little importance to the final outcome. Consequently, a single voter has little ability to penalize a political candidate for advocating policies that are detrimental to that voter. Meanwhile, there are large costs for acquiring accurate information in order to determine whether a candidate's policies are beneficial or harmful to a voter. As a consequence, for a single voter the possible benefit from learning more about a candidate's policies will typically be outweighed by the costs of gathering and processing information about those policies. Therefore, individual voters will typically not be well informed about a candidate's policies and will be "rationally ignorant."

A "political entrepreneur"⁸⁵ may sometimes help unorganized groups overcome this rational ignorance and other organizational problems. A political entrepreneur recognizes that a large group of voters, who might be otherwise ignored by the political process, may have substantial political power if they can be effectively mobilized. The entrepreneur then tries to mobilize this group by offering it organization and information.⁸⁶ With the group mobilized, the entrepreneur can then direct its political power to further the entrepreneur's own purposes.⁸⁷

Nonetheless, the political entrepreneur has a tenuous hold over this group of voters. This tenuous hold can result in an overreaction by this entrepreneur in an attempt to maintain his influence. For instance, Elliott, Ackerman, and Millian describe the effect of political entrepreneurship during the passage of the federal Clean Air Act Amendments of 1970.⁸⁸ At the time, environmental interest groups were unorganized. Senator Edmund Muskie attempted to play the role of a political entrepreneur

83. See generally *COMPARATIVE DISADVANTAGES?: SOCIAL REGULATIONS AND THE GLOBAL ECONOMY* (Pietro Nivola ed., 1997) for examples of how differences in representation affect choices made in trade policies.

84. See ANTHONY DOWNS, *AN ECONOMIC THEORY OF DEMOCRACY* 3-11 (photo. reprint 1977) (1957) (discussing rationality in general).

85. See James Q. Wilson, *The Politics of Regulation*, in *THE POLITICS OF REGULATION* 357, 370-72 (James Q. Wilson, ed. 1980).

86. See *id.*

87. See William W. Buzbee, *Brownfields, Environmental Federalism, and Institutional Determinism*, 21 *WM. & MARY ENVTL. L. & POL'Y REV.* 1 (1997) for additional discussion of political entrepreneurship.

88. See E. Donald Elliott et al., *Toward a Theory of Statutory Evolution: The Federalization of Environmental Law*, 1 *J.L. ECON. & ORG.* 313, 335 (1985).

representing environmental interests. However, because of a rival proposal by President Richard Nixon, Muskie was forced to support another proposal that included "more stringent" technological requirements on industry than he "would have preferred."⁸⁹ Thus, the existence of a political entrepreneur can sometimes lead to more extreme policies than would occur when all interest groups are well organized.

To help understand how a political entrepreneur might mobilize a currently unorganized large group of voters, we turn to triggering mechanisms. These mechanisms were introduced in two of Paul Joskow's works on the regulation of utility rates.⁹⁰ Joskow discusses the circumstances that might "trigger" revisions in utility rates. He notes that consumers, being rationally uninformed, will generally not request rate revision hearings when utility rates are constant or declining (on a nominal basis), even when technological advances have led to significant reductions in cost. However, rising nominal utility rates are more likely to trigger requests for rate revisions. Joskow's analysis implicitly assumes that groups of consumers, when triggered into action, can be a significant political force. In this case, consumers will not respond to a political entrepreneur unless a certain threshold is reached.⁹¹ When this threshold is reached, the consumers will be triggered into action. Using these concepts in a political economy model, we will now examine the decisions of the SCAQMD Board affecting the implementation of RECLAIM.

B. The Inclusion or Exclusion of Small Sources, Mobile Sources, and Consumer Products from RECLAIM

During the initial consultations on RECLAIM, consultants recommended that the scope of the markets for the three pollutants be as broad as possible.⁹² For NO_x and SO_x, the District considered including mobile sources and permitted stationary point sources within the scope of the market.⁹³ Meanwhile, the possible scope for the VOC market included large stationary sources (emissions greater than ten tons per year), smaller

89. *See id.* at 337.

90. *See generally* Paul L. Joskow, *Pricing Decisions of Regulated Firms: A Behavioral Approach*, 4 *BELL J. ECON.* 118 (1973); Paul L. Joskow, *Inflation and Environmental Concern: Structural Change in the Process of Public Utility Price Regulation*, 17 *J.L. & ECON.* 291 (1974).

91. Consumers will not respond as long as their expected loss from a political decision is less than the costs of their response. The costs of their response stay constant, but with greater effort by the political entrepreneur, the consumers' perception of expected loss from the political decision may rise to the point where they are triggered into action.

92. *See* HARRISON & NICHOLS, *supra* note 48, at 50.

93. *See id.*

sources (emissions between four and ten tons),⁹⁴ mobile sources, and consumer products.

Because large stationary sources within the district have been extensively regulated under CAC, their possible inclusion within the scope of RECLAIM would seem to be automatic. Therefore, this article will concentrate on the decisions on whether to include smaller sources, mobile sources, and consumer products. It will look at what information was available under the status quo to groups affected by these decisions, to determine what they might expect from inclusion versus exclusion, and will then analyze whether this information might trigger a negative response to inclusion. Environmental and public health interest groups were not directly involved in the process at this stage. However, large businesses were directly affected by these decisions. Therefore, the article will also examine the counterbalancing influences of these businesses concerning these decisions and then compare the effects of these responses on the reelection chances of the District Board to explain the Board's decisions on scope.

1. Inclusion of Smaller Sources in Future VOC RECLAIM Proposals

Smaller stationary sources of VOCs were relatively less regulated—compared to large VOC sources—under the prior system. Consequently, they were less well organized and less informed as to the cost of complying with regulations. Small sources had the impression that command-and-control regulations are costly to comply with.⁹⁵ Also, some of these sources were familiar with the RECLAIM proposal, while many others were not.⁹⁶ Those who were somewhat familiar believed that a market proposal could be less costly to comply with.⁹⁷ However, while there were some administrative costs associated with compliance with CAC regulations, those familiar with RECLAIM did expect administrative costs under RECLAIM to be much higher.⁹⁸ Many sources also expected tighter controls than in the past.⁹⁹ While the small sources had some doubts as to the benefits of RECLAIM, there were no specific threats to the viability of these firms at this early stage because there was no specific market proposal. Because they were not organized significantly to begin with, and without any specific threat to mobilize better organization, the

94. Such as auto body shops.

95. See *ELECTICA, A SURVEY OF ATTITUDES AND OPINIONS OF PROSPECTIVE REGIONAL CLEAN AIR INCENTIVES MARKET PARTICIPANTS 15* (1993).

96. See *id.* at 21.

97. See *id.* at 22-24.

98. See *SMALL BUSINESS COALITION, RECLAIM: THE SMALL BUSINESS PERSPECTIVE 19* fig.8 (1992).

99. See *id.* at 15.

reaction of small sources to a decision to include them within the scope of a proposal at that time was mild.¹⁰⁰

On the other hand, their exclusion would have significantly reduced the opportunities for cost savings for larger sources. This is because, being less intensely regulated, these sources have lower marginal abatement costs than larger sources, which had been more intensely regulated. Because large businesses are well informed and well organized, the early exclusion of small businesses from a proposal for VOC RECLAIM would therefore cause a reaction by large businesses. Thus, the District Board realized that exclusion of small sources at this stage would damage their likelihood of reelection more than inclusion, and consequently decided to include smaller sources in the next iteration of VOC market proposals.

2. Exclusion of Mobile Sources and Consumer Products

Mobile sources and consumer products were even less regulated than small sources under CAC. This lack of regulation had several effects. One was that the marginal abatement costs¹⁰¹ for mobile sources and consumer products were significantly lower than those for large, heavily-regulated sources. Large sources had already implemented low-cost methods of abatement, but unregulated sources had not adopted even very low-cost methods of abatement. Marginal abatement costs for large sources, therefore, depend on higher-cost methods. Unregulated sources could adopt very low-cost methods of abatement, and, thus, had very low marginal abatement costs.

The gains from trades between these groups consist of this differential in marginal abatement costs. Inclusion of mobile sources and consumer products would offer opportunities for substantial abatement cost savings, as large sources would be able to purchase permits from them at a lower price than the large sources' own abatement costs. These savings would lead to higher profits for large sources and to reduced prices for their customers. Large sources would, therefore, want mobile sources and consumer products included within the scope of the market.

The lack of regulation also meant that mobile sources and consumers of consumer products were not organized. Their large numbers and diversity also contributed to their disorganization. These two groups

100. None of the seventeen letters sent as comments to the NO_x/SO_x RECLAIM proposal was written by these sources, or their representatives. See RECLAIM VOL. III, *supra* note 63 at app. III-H (1993).

101. Abatement costs are the costs of reducing pollution. They can include the costs of equipment to clean emissions, the costs of adopting alternative, lower-polluting processes or products, and other costs associated with attempts to reduce emissions by a source.

were also rationally ignorant about many environmental regulations. Their information about CAC would be based on their current experiences. Because they would rationally not search for additional information, their expectation of the impacts of CAC in the future would be a continuance of the impacts of CAC in the present, which were few. Consumers and mobile sources would then compare this expectation of few impacts under CAC to the expected impacts under RECLAIM. However, they would have virtually no expectation about what participation in RECLAIM would imply. Nevertheless, these groups could be susceptible to information about RECLAIM provided by a political entrepreneur. To determine what information might be provided by a political entrepreneur, we need to carefully consider the ramifications of the operation of an emissions market for prices of products generating NO_x, SO_x, and VOC emissions, and the corresponding consequences on consumers' and drivers' welfare.

There will be two significant effects on production costs of these products from the use of an emissions market. First, marginal abatement costs for some products may be lowered. Second, the permits themselves will represent a marginal cost of production. Even if permits are given to manufacturers of these products, so that the underlying profitability of these businesses is not affected, these permits will still represent an opportunity cost of production to these firms. This is because, under the market mechanism, these permits could be sold and used elsewhere.

The total effect on the production costs, then, is a combination of possibly lower abatement costs and the positive opportunity costs of permits. For some products, there could be some net savings of these production costs. For others, the opportunity costs of permits could dominate, leading to higher marginal costs of production. The incidence of these cost changes will be shared between producers and consumers, depending upon the relative elasticities of supply and demand. If demand is more elastic than supply, producers will bear a greater proportion of the incidence, and if supply is more elastic, consumers will bear more of the incidence.

We now need to examine more closely the particular effects of including consumer products within the scope of the market, and the effects of including mobile sources. Consumer products were extremely unregulated, so their marginal abatement costs were very low. Participation in the market therefore would not lead to any reductions in these costs. Meanwhile, the opportunity costs of the permits would lead to higher production costs for these products.

A large portion of the incidence of these higher production costs would fall on consumers within the district. There would be some substitute products with lower emission rates (and hence involving lower opportunity costs for permits) for consumers, so elasticity of demand would not be very small. However, it is likely that the elasticity of supply

would be even higher, as manufacturers of these products could sell them in another region that did not require the use of permits.

The consequences of this incidence could be significant. In early reports prepared for the District, consultants made very rough estimates of price changes that might result from inclusion of consumer products in an emissions market. For instance, the prices of high emitting aerosol air fresheners were expected to double because of inclusion of these products in a VOC market.¹⁰² Also, the price of high emitting hairspray was expected to triple, from \$2.40 to more than \$7.00.¹⁰³

Meanwhile, consumers in the district would not be compensated through grandfathered permits. Because of the difficulty in monitoring emissions generated by individual users of consumer products, the locus of regulation of these products would be the original manufacturers, distributors, or retailers of these products. While it would be possible to allocate permits to one of these groups based on an inventory of prior sales, it would be impossible to allocate permits to individual consumers because of inadequate documentation of prior usage.

Groups of consumers would therefore face higher prices without a compensatory endowment of grandfathered permits. Consequently, local consumers would be significantly harmed by the inclusion of consumer products within the scope of the VOC market. Nevertheless, these detrimental consequences might not trigger an adverse political response by consumers. Consumers are rationally ignorant and thus would not necessarily be informed of these detrimental consequences. Groups of consumers also lack the organization to exert a significant political statement. On the other hand, groups of consumers are susceptible to a political entrepreneur. This entrepreneur could be a politician opposed to RECLAIM, or an industrial interest group adversely affected by this decision. Here, the District Board would need to determine whether some industrial group might be adversely affected by inclusion of consumer products, and, thus, might present itself as a political entrepreneur.

Unfortunately, at the time the board made its decision concerning the scope of the RECLAIM market, no direct evidence could be found of the existence of a political entrepreneur at this stage. Some articles did suggest that the politicians on the District Board were cognizant of the danger of supporting environmental policies that would adversely affect the economy of the Los Angeles Basin, which was in a severe recession at

102. See HARRISON & NICHOLS, *supra* note 48, at 99-100.

103. See *id.* at 100.

the time.¹⁰⁴ However, no articles directly identified a political entrepreneur at this point. Nevertheless, closer inspection suggests some possibilities.

For example, manufacturers, distributors, or retailers could become the political entrepreneur that would trigger a consumer response. As pointed out above, grandfathered permits for consumer products could be allocated to the manufacturers, distributors, or retailers of these products. However, these permits could only go to one of these groups, not all of them.¹⁰⁵ As a consequence, there would be some group that would not receive these grandfathered permits. Because inclusion of these products would lead to higher prices, demand for these products would be reduced. Consequently, those groups not receiving permits would be harmed by the inclusion of these products within the scope of the market. For the moment, we shall assume that local distributors would be the recipients of these permits. The manufacturers of these products, many of which are located outside of the District, would not receive any allocation of permits, nor would retailers.

In this case, the manufacturers of consumer products would be harmed by the inclusion of these products within the scope of the market because the higher price for these products resulting from the opportunity cost of permits will lead to lower demand. Because many of these manufacturers are located outside of the District, representation bias would imply that they would not be able to directly affect the decision of the Board. However, they could serve as a political entrepreneur, and attempt to organize their customers to express their displeasure with the increased prices for their products.

These manufacturers would have several advantages in acting as a political entrepreneur in this case. Individual consumers would be more likely to find them credible, because these consumers have had experience in using their products. Moreover, these manufacturers would be able to offer credible information to consumers that they would be directly harmed by inclusion of these products within the emissions market. The

104. See Larry B. Stammer, *AQMD Rejects Key Smog Proposals in Blow to Businesses*, LOS ANGELES TIMES, Aug. 8, 1992, at A1 ("Immediately after the vote to reject the nine key proposals, one businessman vowed to mount a grass-roots campaign to oust AQMD board members who had voted against the pro-business proposals."); Jeffrey A. Perlman, *Smog Rules Driving Firms Out of Area*, LOS ANGELES TIMES, Mar. 17, 1992, at B1; Judy Pasternak, *Complaints by Industry Spur AQMD Shift*, LOS ANGELES TIMES, Nov. 7, 1991, at A3 ("Prompted by complaints that clean-air rules are driving industries away or out of business, the S. Coast Air Quality Management Dist. on Wednesday announced a series of reforms of its complex bureaucratic processes."); Judy Pasternak, *AQMD Approves Changes to Region's Clean Air Plan*, LOS ANGELES TIMES, July 13, 1991, at A1 ("About a dozen pickets outside the hotel's entrance [at a public hearing of the District Board] held signs reading 'SCAQMD Unfair to Business.'").

105. If all three groups received permits, a product that generated one ton of emissions would lead to the issuance of 3 tons of permits, and consequently 3 tons of emissions.

manufacturers could point to the District's study that estimated the effects of inclusion on the price of aerosol air fresheners and hairspray.¹⁰⁶ In contrast to a study commissioned by the manufacturers themselves, where there would be a strong incentive to overestimate the effect, these results would have strong credibility with individual consumers. These manufacturers could, therefore, present this information to consumers, and it would seem credible to them.

Manufacturers of consumer products could then offer their organizational skills to help mobilize their customers who were constituents of the District Board. With this information and organization, individual consumers could be triggered into expressing their dissatisfaction with a decision to include consumer products within the scope of the market.

On the other hand, inclusion of consumer products in the scope of a VOC market would lead to lower VOC abatement costs for small and large businesses within the district.¹⁰⁷ All of these cost savings would not accrue as profits for these businesses, however. Because of elasticities of supply and demand, consumers of the products of these businesses would also benefit from these cost savings. However, while these businesses themselves are not affected by representation bias, a large portion of their consumers would be. Some of the products produced by the larger companies included semiconductors, automobiles, and commercial and military aircraft. A great portion of these products is consumed outside of the District. While these consumers would benefit, the District Board would not give their interests much credit. Being unorganized, these consumers would not make significant contributions to the District Board. Furthermore, with these consumers located outside of the District, political entrepreneurs would be unable to tap into their voting power, for it would not exist.

Thus, inclusion of consumer products within the scope of VOC RECLAIM would have benefited many in-district businesses, including many well-organized ones. These businesses should have been willing to make significant contributions to improve the District Board's chances for reelection. Inclusion would have also helped consumers located outside of the district, but these consumers would have no influence over the District Board. Meanwhile, households within the district would expect to be significantly harmed by significant increases in prices for consumer products that generated VOCs. These households also would not be compensated by endowments of grandfathered permits. While these

106. See HARRISON & NICHOLS, *supra* note 48, at 99-100.

107. Recall that marginal abatement costs of consumer products are extremely low, while businesses' MACs are higher.

households are typically unorganized, political entrepreneurs would arise to tap into their discontent with this decision. When this happened, the District Board could expect to feel the power of the large number of votes that could be affected by this issue. With much of the influence of groups that supported inclusion of consumer products minimized by representation bias, the District Board decided that the potential influence of local households distraught by increased prices outweighed the influence of local business groups, and they consequently chose to exclude consumer products from the scope of VOC RECLAIM.¹⁰⁸

For mobile sources, a similar but slightly different process occurred. Drivers have more information about the consequences of tighter CAC regulations for mobile sources. They are familiar with increases in gasoline prices caused by these regulations, the costs from "smog check" maintenance programs, and the costs of additional emissions control equipment on new cars. They would realize that tighter CAC regulations would increase the costs associated with all of these. However, they would also realize that they might have the opportunity to delay some of these regulations, or lessen the impact of individual regulations.¹⁰⁹

Meanwhile, if mobile sources were to be included in the scope of the NO_x/SO_x and VOC markets, distributors of gasoline and automobiles would be required to redeem the necessary quantity of permits for each gallon or auto sold. For the VOC market, the story is roughly the same as the one above for consumer products. Local drivers would bear a substantial proportion of the incidence of the increased production costs represented by the opportunity costs of the permits. The beneficiaries of this would include gasoline refineries, automobile manufacturers, large local businesses with VOC emissions, and a variety of customers of these large local businesses, with many of these customers located outside the district.

For the NO_x/SO_x market, local drivers would again bear a substantial proportion of the incidence of increased costs. Beneficiaries again include gasoline refineries, auto manufacturers, large local businesses with NO_x/SO_x emissions, and many customers of these businesses located outside of the district. There is a slight difference in this case because local consumers of electrical power would also benefit from inclusion of mobile sources in the NO_x/SO_x market. In other words, many

108. See FEASIBILITY SUMMARY RECOMMENDATIONS, *supra* note 19, at 2-1 to 2-2; VU ET AL., *supra* note 70 at EX-7 to EX-8.

109. Because of the complexity of command-and-control regulatory implementation, it takes a long time to fully implement CAC regulations. Also, the participatory process of CAC regulation enables negotiation that might favor sources that are directly involved in the negotiations at the expense of sources not directly involved.

of the same people within the district who would be harmed by inclusion as drivers would be benefited as customers of electrical power.

While the counterbalancing arguments are stronger in this case, nevertheless many of these benefits from inclusion of mobile sources would flow to consumers and businesses outside of the District. Meanwhile, the possible burden on the large numbers of drivers within the District could be very large. For example, the same consulting study discussed above estimated that inclusion of new automobiles in a VOC emissions market could result in an increase in the price of a car by \$1100.¹¹⁰

The District Board could expect political entrepreneurs to arise and present this damaging information if the Board decided to include mobile sources within the scope of RECLAIM. It would be difficult to explain to these drivers that these detrimental consequences would be ameliorated somewhat by slightly lower electrical rates. Consequently, drivers would compare the expected higher costs of tighter CAC regulations with their expectations of costs under RECLAIM.

In this comparison, the effects under RECLAIM would appear significantly higher than the effects of tighter CAC regulation. While drivers would expect RECLAIM to raise new car prices by \$1100, they would expect the increases under CAC to be much less expensive. The current cost of extra California emissions equipment is approximately \$200,¹¹¹ and drivers would probably expect the additional cost of tighter CAC to be something close to that. Thus, the additional costs under RECLAIM would be almost an order of magnitude higher than under CAC, and CAC would have the additional advantage for drivers of the delay in implementing new regulations, as opposed to more immediate implementation of an emissions market. As a result, the District Board could expect that drivers, informed and organized by political entrepreneurs, would be triggered into a response by the Board's decision to include mobile sources within the scope of RECLAIM.

On the other hand, local businesses would support this inclusion, as would external consumers and businesses. However, these local businesses would represent a much smaller number of voters, and external businesses and consumers would not represent any. These groups would only be able to provide campaign contributions to reward the District Board for including mobile sources within the scope of RECLAIM.

110. See HARRISON & NICHOLS, *supra* note 48, at 122. Their estimate assumed that the car would emit 100 pounds of NO_x and 50 pounds of VOCs. See *id.*

111. The retail price of California emissions equipment on a 1998 Ford Taurus is \$170. See Edmunds.com, *The 1998 Ford Taurus LX Sedan*, (visited June 4, 2000) <<http://www.edmunds.com/newcars/1998/ford/taurus/lxsedan.html>>.

Nonetheless, weighing the expected response from drivers within the District that would be triggered by inclusion of mobile sources versus the expected contributions from businesses, the District Board decided to exclude mobile sources from the scope of RECLAIM.¹¹²

After the decisions to exclude both consumer products and mobile sources, the scope for future proposals would include only large businesses for NO_x/SO_x RECLAIM, and small and large businesses for VOC RECLAIM.

C. NO_x/SO_x RECLAIM

The next decision for the District Board was whether to implement NO_x/SO_x RECLAIM. The Board first needed to develop a plan for this emissions market. In developing this plan, it considered the constraints imposed by the legal rights of environmental and public health groups.

In deciding whether to implement this plan, the Board then considered the reactions of different interest groups. One large company, the Southern California Gas Company, was strongly opposed to this plan, while other companies were strongly supportive. Consumers of the products produced by these businesses were also affected by this plan, and many of these consumers resided within the District. However, it was very unlikely that these consumers would be triggered into a negative response. Environmental and public health groups also responded to this proposal. The District Board made its decision based on these responses.

1. Background to the NO_x/SO_x RECLAIM Proposal

The plan that the District developed for NO_x/SO_x RECLAIM had to meet certain requirements set by the federal and state clean air acts. To comply with these acts, the District had submitted its 1991 Air Quality Management Plan (AQMP), which specified how it would achieve the emission targets set by this legislation.¹¹³ In the AQMP, the District set up two tiers for reduction of NO_x and SO_x emissions.¹¹⁴ The first tier was to be complete by year 2000, and the second by 2003.¹¹⁵ If the proposal for NO_x/SO_x RECLAIM did not meet these restrictions, the District Board could expect that environmental and public health groups would then sue, claiming that the RECLAIM program was in violation of the clean air acts.

112. See RECLAIM VOL. I, *supra* note 19, at EX-8.

113. This plan was submitted to the federal EPA in order to comply with the California Clean Air Act of 1988, 1988 Cal. Adv. Legis. Serv. 1568 (Deering) §172 (codified in scattered sections of California Health & Safety Code).

114. See RECLAIM VOL. I, *supra* note 19, at 5-13.

115. See *id.* at EX-10.

If the District was found to be in violation of the acts, a number of penalties could be imposed, including elimination of new source permitting.¹¹⁶ These suits could be very damaging to the Basin's economy, and, hence, damaging to the Board's chances at reelection.

Before explaining the proposal, the article will first describe some of the information available to interest groups under the existing status quo. One of the important pieces of information provided by the status quo was the existence of fairly clear endpoints. Hahn noted that the clarity of the environmental quality goals of an economic incentive program was important to that program's success,¹¹⁷ and the targets set under the District's two tiers of reductions provided very clear goals. Also, NO_x/SO_x emissions of large sources were well monitored, so monitoring concerns would not be expected to pose significant obstacles. Furthermore, both the industries and regulators had experience in dealing with NO_x/SO_x abatement technologies and compliance issues. Indeed, the District had already adopted many rules with future implementation dates (after 1994 but before 2000).¹¹⁸ After going through the regulatory hearing process, these rules consequently represented a consensus on what type of emissions-reducing technologies would be available in 2000.

2. *The NO_x/SO_x RECLAIM Proposal Made by District Staff*

Given this information base, District staff drafted a detailed proposal for NO_x/SO_x RECLAIM, and presented it in February 1993.¹¹⁹ The facilities involved in this program included 390 NO_x facilities and 41 SO_x facilities.¹²⁰ An important characteristic of these was that all were owned by large businesses. Small businesses were specifically exempted from this RECLAIM program.¹²¹ Mobile sources were not included in the allocations, although a legacy program whereby facilities within RECLAIM could generate trading credits by retiring automobiles was maintained.¹²²

One of the most important features of this proposal was the time sequence of permits allocated to individual facilities. This sequence was based on three reference points: starting, intermediate, and final

116. Without new source permits, no construction of new facilities emitting these pollutants could take place.

117. See Hahn & Hester, *supra* note 3, at 111.

118. See RECLAIM VOL. I, *supra* note 19 at 5-15 to 5-16 tbl.5-2.

119. See *id.* at 1-4.

120. See *id.* at EX-3.

121. See *id.* at EX-8.

122. This feature was not expected to be widely used and, hence, would have little effect on equilibrium prices of these cars. Indeed, there was a limit of 30,000 vehicles per year. See RULES AND REGULATIONS, *supra* note 30, at 2008-1.

allocations.¹²³ Allocations for these reference points were calculated by multiplying the pre-determined "activity level" of an individual facility by the relevant starting/intermediate/final "emissions factors." For example, [Number of Allocated Permits for Starting Year for Facility A] = [Activity Level of Facility A] * [Starting Year Emission Factors]. Allocations for all other years were based on a straight-line reduction between the two surrounding reference allocations.

"Activity levels" refer to the total amount of throughput hours certain equipment was in use at a facility.¹²⁴ It corresponds with the level of production of a facility. The activity levels used by the district to calculate allocations were the maximum reported activity levels from 1989 to 1992 inclusive.¹²⁵ The method of basing future allocations on past activity implied that individual allocations were grandfathered.

It is important to note that the non-recessionary year of 1989 was included in calculating these levels. The District wanted to include a non-recessionary year because they felt that this would be critical in gaining the support of the business community.¹²⁶ Furthermore, inclusion of 1989 was possible because even with the resultant increases in allocated permits, the RECLAIM plan still met the targets set in the 1991 AQMP.¹²⁷

"Emission factors" tell how much of a pollutant is produced from operating particular emissions-reducing technologies for a certain amount of time. Starting emission factors were based on District Rules 1109 and 1146, both of which were implemented before 1994.¹²⁸ These factors were used for calculating individual allocations for 1994, the first year of RECLAIM. Thus, during the first year, businesses did not feel a reduction in their emissions.

Intermediate emission factors were used to calculate individual allocations for year 2000.¹²⁹ The 1991 AQMP had specified some technologies as "Tier I control measures," and these technologies would be the first phase of a strategy to reduce future emissions.¹³⁰ These control measures had already been adopted as District Rules A-C-05, P-B-01,02, and 6; P-C-02, and 04-08; and P-F-01 and 02.¹³¹ These rules had effective dates after

123. See RECLAIM VOL. I, *supra* note 19, at EX-8 to EX-9.

124. See *id.* at EX-8.

125. See *id.* at EX-9.

126. See Telephone Interview with Jack Broadbent, NOx/SOx Program Manager, S. Coast Air Quality Management Dist., (July 12, 1996).

127. See *id.*

128. See RULES AND REGULATIONS, *supra* note 30, at 1109-1 and 1146-1.

129. See RECLAIM VOL. I, *supra* note 19, at 2002-8 to 2002-9 app.I-A (reprinting Rule 2002).

130. See RECLAIM VOL. I, *supra* note 19, at 5-13.

131. See *id.* at 5-15 to 5-16.

1994 but before 2000. The technologies specified by these rules, therefore, were used to calculate intermediate emission factors.

Final emission factors were used to calculate allocations for 2003.¹³² To calculate these factors, the District adjusted the emission factors for 2000 to achieve equivalency with the 1991 AQMP emission projections—essentially, air quality targets—for NO_x and SO_x for 2003.¹³³ For NO_x, the 2003 emission factors represented a 27 percent reduction from the 2000 factors. For SO_x, the 2003 factors were 25 percent lower than the 2000 factors.

Under RECLAIM, the District would drop its evaluation of air quality based on implementation of particular technologies. Because of this, the District officers were not constrained by particular control measures or control targets described in the 1991 AQMP. They were, however, constrained by their previously adopted rules, and by air quality targets set in the AQMP. These targets were set in order to comply with the federal and California clean air acts. Because the starting and intermediate emission factors for RECLAIM were based on already adopted rules, emissions under RECLAIM satisfied the previously adopted rules. Meanwhile, RECLAIM also met its air quality targets for 2003, because the final emissions factors were specifically calculated to achieve those targets.

3. Responses by Businesses Affected by This Proposal

The primary local businesses¹³⁴ affected by this decision would be electric utilities, oil refineries, and the natural gas company. Whether electric utilities and oil refineries would prefer NO_x/SO_x RECLAIM would depend on how it would affect their profits compared to CAC. One factor that would affect their profits would be the difference between the amount of permits allocated under RECLAIM versus total emissions allowed under CAC. These differences could arise because of differences in expected activity levels allowed under the two programs, or differences in the expected emission factors implied by the programs.

Activity levels under NO_x/SO_x RECLAIM included non-recessionary levels. It is unlikely that utilities and refineries would expect activity levels under CAC to be substantially higher than these non-recessionary levels. Therefore, we would not expect significant differences because of this factor.

132. See *id.* at 2002-8 to 2002-9 app.I-A (reprinting Rule 2002).

133. See S. COAST AIR QUALITY MANAGEMENT DIST., II RECLAIM app.II-C-5 (1993) [hereinafter RECLAIM VOL. II].

134. Recall that because of representation bias, we will only consider contributions from local businesses.

Also, there would be little differences in expected emission factors. CAC rules were used to determine intermediate factors, so there would be no difference for those factors. Meanwhile, because the District would be forced to comply with its 1991 AQMP targets, it would also be reasonable for businesses to expect that the emission factors implied by future CAC rules would be very similar to those used in calculating RECLAIM allocations. Thus, utilities and refineries would not expect significant differences between the amount of permits allocated under RECLAIM versus total emissions allowed under CAC.

Utilities and refineries were among the most tightly regulated sources of NO_x and SO_x emissions, and they, therefore, had some of the highest marginal abatement costs. Consequently, because the scope of the market included sources with lower marginal abatement costs, RECLAIM would also offer utilities and refineries opportunities to purchase additional permits at prices that would be much lower than their own marginal abatement costs.¹³⁵ This would enable these utilities and refineries to lower their costs of production. Additional cost savings from RECLAIM would be expected in the future, because economic-incentive-based instruments give stronger incentives for the development of new emissions-reducing technologies.

Thus, in comparing NO_x/SO_x RECLAIM with CAC, local electric utilities and oil refineries would expect substantial cost savings through the use of RECLAIM. Depending on elasticities of supply and demand, some of these cost savings would yield increased profits for the utilities and refineries. In turn, the utilities and refineries would definitely support NO_x/SO_x RECLAIM, and be willing to contribute some of these profits to help reelect the District Board. Indeed, the large businesses affected by RECLAIM did announce their support for NO_x/SO_x RECLAIM.¹³⁶

On the other hand, while this proposal would help electric utilities, a competitor of these utilities, the Southern California Gas Company, would be indirectly harmed by RECLAIM. The lower costs of the utilities would lead to lower prices of electricity, which is a substitute for natural gas. The Gas Company could, therefore, expect a reduction in demand, and, thus, a reduction in profits due to this indirect effect of RECLAIM. As a result, the Gas Company indeed was a vocal opponent and "highly critical" of RECLAIM.¹³⁷

135. Recall that they could purchase permits from facilities with lower MAC, and the price paid would be slightly higher than these lower MAC.

136. See Telephone Interview with Robert Wyman, *supra* note 61.

137. See Maria Cone, *Smog Market Set to Open in Southland*, LOS ANGELES TIMES, Dec. 28, 1993, at B1.

4. *Would Local Consumers Be Triggered into Action because of NO_x/SO_x RECLAIM?*

The District Board would also consider the reaction of unorganized consumers of electricity and gasoline to the NO_x/SO_x RECLAIM proposal. Because these consumers include the entire electorate, they could potentially have an overwhelming influence on the District Board if they could be triggered.

It would be necessary for some political entrepreneur to present himself in order to trigger these consumers. We normally think of political entrepreneurs as rival politicians, but in this case the most likely candidate would be the Gas Company. The Gas Company would expect to be harmed by RECLAIM, but they might expect that their opposition alone would be insufficient in the face of approval by directly benefited businesses such as electric utilities and oil refineries. They would, therefore, look for political allies to help defeat NO_x/SO_x RECLAIM.

In order for the Gas Company to trigger consumers of electricity and gasoline to oppose NO_x/SO_x RECLAIM, they would need some credible information that NO_x/SO_x RECLAIM would harm these consumers. In particular, the Gas Company would need to credibly explain that electricity and gasoline prices would rise because of RECLAIM. However, as discussed above, all indications suggested that NO_x/SO_x RECLAIM would lower the costs of electric utilities and oil refineries. Consumers would reasonably expect that these lower costs should lead to lower prices, not higher prices.

Additionally, consumers of electricity might not trust the credibility of the Gas Company if it attempted to convince consumers that RECLAIM would raise electricity prices. These consumers would realize that the Gas Company, as a competitor to electric utilities, would benefit by increased electricity prices, and would only complain if electricity prices were expected to be lower. These consumers would, therefore, place very low credibility to any statement made by the Gas Company that consumers should act to prevent increases in electricity prices.

The Gas Company apparently recognized its difficulty in providing credible information to trigger electricity and gasoline consumers to oppose NO_x/SO_x RECLAIM. The Gas Company actually did act as a political entrepreneur. However, rather than attempting to ally themselves with electricity and gasoline consumers, the Gas Company instead courted small businesses.¹³⁸ This effort was not very significant because NO_x/SO_x

138. See Richard D. Farman, *Perspective on Pollution. RECLAIM: Can the Regional Clean Air Incentive Program Work?*, LOS ANGELES TIMES, Oct. 13, 1993, at B7. The chief message of this editorial by Farman, Chief Executive Officer of the Gas Company, was that RECLAIM was

RECLAIM directly affected very few small businesses. Meanwhile, there seemed to be no indication that consumers of electricity and gasoline would be triggered into action by the implementation of NO_x/SO_x RECLAIM.

5. Responses of Environmental and Public Health Interest Groups

Environmental and public health groups did not like the NO_x/SO_x RECLAIM proposal because, during its initial years, the total amount of emissions allowed by allocated permits was higher than the total amount of actual emissions during recent years.¹³⁹ They, in particular, did not like the fact that the allocation method used peak activity levels rather than average activity levels.¹⁴⁰ However, because this proposal satisfied the environmental quality requirements of the 1991 AQMP, these groups did not have the ability to sue based on a violation of the clean air acts. The groups were able to ensure that the program would have significant monitoring and program evaluation requirements.¹⁴¹ However, their ultimate influence on whether the program would be adopted was limited.¹⁴²

6. The Decision by the District Board on NO_x/SO_x RECLAIM

The District Board then weighed these expected reactions by the local parties affected by NO_x/SO_x RECLAIM. They would expect to get additional campaign contributions from utilities and refineries because RECLAIM would directly increase their profits by lowering their costs. They would also expect to get lower contributions from the Gas Company, because RECLAIM would indirectly lower the Gas Company's profits by lowering the price of competitive products. They also did not expect a political entrepreneur to trigger consumers of gasoline and electricity, because the entrepreneur would not offer credible information that these consumers would be harmed by RECLAIM. Environmental and public health interest groups disapproved of this proposal, but their ability to withhold votes and contributions was limited.¹⁴³ These groups also were unable to file a lawsuit on the basis of a violation of the clean air acts, because the program complied with the 1991 AQMP. Weighing these

"unfair to smaller facilities." *See id.*

139. *See generally* Feuer et al., *supra* note 79.

140. *See id.*

141. *See* Telephone Interview with Jack Broadbent, *supra* note 126.

142. Despite the strong opposition, the program was adopted anyway.

143. The number of constituents represented by these groups was much lower than the number of constituents who had jobs with or were consumers of the large businesses supporting the program.

expected reactions, the District Board voted to approve the implementation of NO_x/SO_x RECLAIM.

D. VOC RECLAIM

While the District was able to develop a politically acceptable plan for NO_x/SO_x RECLAIM within the constraints imposed under the state and federal clean air acts, these acts placed even more constraints on the District's VOC RECLAIM proposal. This article will now examine these constraints and their effects on the response to this proposal by business groups.

1. Constraints Placed on the District

Once again, the primary constraints on the District came from the federal and California clean air acts. The California CAA required firms within the District to adopt the Best Available Retrofit Control Technology (BARCT).¹⁴⁴ The implications of BARCT for NO_x and SO_x had been determined before the RECLAIM proposal was developed, but the implications for VOC were not known. Consequently, to comply with the law, the District would first need to determine what abatement technologies for VOCs should be classified as BARCT. To do this, the District would need to conduct a technology assessment. Environmental and public health groups could constrain the District's decisions during this assessment. If the District was too lenient, these groups might request a reevaluation of the conclusions on BARCT from the assessment.

The high degree of uncertainty between reported emissions and actual emissions of VOCs also restrained the flexibility of the District when developing the VOC RECLAIM proposal. Reporting of VOC emissions is frequently done by multiplying reported activity levels by given emission factors, rather than actual monitoring of emissions. Without program rules forbidding their use, businesses may substitute paints and solvents with higher actual emissions rates than those used to calculate the given emission factors. These alternatives are frequently cheaper, and, therefore, will probably be used in large quantities.¹⁴⁵ Consequently, actual VOC emissions may be much higher than what is reported. This underestimation of actual emissions would limit the amount of permits the District could allocate.

144. See RECLAIM VOL. I, *supra* note 19, at EX-28.

145. See Interview with Anupom Ganguli, VOC Program Manager, S. Coast Air Quality Management Dist., in Diamond Bar, Cal. (July 24, 1996).

Another constraint was the explicit requirement for continual actual reductions of VOCs from the federal Clean Air Act.¹⁴⁶ While NO_x/SO_x RECLAIM did have to achieve substantial, specific reductions when it ended, District staff had the flexibility to grant initial year allocations representing a higher level of pollution than recent actual emissions,¹⁴⁷ because they did not have to comply with an explicit requirement for continuing reductions.

The constraint of continuing reductions became even more binding because of the timing of the VOC RECLAIM proposal. When NO_x/SO_x RECLAIM was proposed and eventually adopted, the most recent AQMP was from 1991, and the most recent emissions inventories were from 1990. These inventories from 1990 were one of the benchmarks upon which NO_x/SO_x RECLAIM would be judged. Because the recession of the early 1990s hit the Basin in mid-1990, these inventories were only partially affected by the recession. Additionally, the facilities involved in NO_x/SO_x RECLAIM were relatively less affected by the recession.¹⁴⁸ Consequently, 1990 inventories acted as a relatively loose benchmark for NO_x/SO_x RECLAIM.

On the other hand, when the District proposed VOC RECLAIM in May 1995, the most recent AQMP was from 1994, and the most recent emissions inventories were from 1993. The data from 1993 showed significant decreases in actual VOC emissions.¹⁴⁹ For stationary sources, the planning inventory of VOC emissions dropped from 814 tons per day in 1987, to 745 tons per day in 1990, to 491 tons per day in 1993.¹⁵⁰ These extremely significant reductions in VOC emissions for 1993 showed the substantial impact the recession had on businesses that generated VOC emissions.

Meanwhile, the federal Clean Air Act, in Section 182(c)(2), required that each "ozone nonattainment area achieve actual VOC emission reductions of at least three percent per year" beginning in 1997.¹⁵¹ The next emissions inventory after 1993 would be taken in 1996, so it would not be subject to this specific provision.¹⁵² However, the emissions inventory in 1999 would be subject to this continuing reduction requirement, and would have to be nine percent lower than the 1996 emissions inventory. This

146. Clean Air Act Amendments of 1990, 42 U.S.C. § 7511b (1994).

147. Something that was protested vigorously by environmental groups.

148. This is because the demand for gasoline and electricity is relatively inelastic to changes in income.

149. See S. COAST AIR QUALITY MANAGEMENT DIST., 1997 AIR QUALITY MANAGEMENT PLAN, 3-8 tbls. 3-1A and 3-1B, 3-9 tbls. 3-2A and 3-2B, 3-10 tbls. 3-3A and 3-3B (1997).

150. See *id.*

151. See 1994 AQMP, *supra* note 28, at 6-2.

152. Recall that inventories are required every three years.

would be a significant constraint on the amount of permits it could allocate for VOC RECLAIM. If the District Board failed to consider these constraints, environmental and public health interest groups could sue based on a violation of the clean air acts.

2. Informational Context

Compared with NO_x/SO_x RECLAIM, much less information was available under the status quo for VOC RECLAIM. Without a consensual technology assessment, the endpoints of the VOC program were unclear. Indeed, little about future VOC emissions-reducing technologies was known.

While the District did not know much about the specific technologies, they did have some experience with industry objections to the development of these technologies. In prior debates over claims of "technology forcing," District staff found that industry would almost always say a technology would not be available in the future.¹⁵³ Nonetheless, most of the time these technologies did develop and become available to the industries.¹⁵⁴

Another important component of the informational context was the means that different groups had for processing the available information. Environmental compliance staffs have a better understanding of the implications of particular technological requirements on production. They also are more familiar with the progression of the development of abatement technologies. When VOC RECLAIM was proposed, large facilities employed an environmental compliance staff, because they were needed to assist in ensuring compliance with existing CAC regulations. On the other hand, subject to far fewer CAC regulations, small facilities frequently did not employ any environmental compliance experts, and, thus, did not have as much information about technological requirements and the development of abatement technologies as large businesses did.

3. Proposal by District

The market proposal for VOC RECLAIM included all facilities that emitted more than four tons of VOC per year.¹⁵⁵ These facilities could be broken into two groups: those belonging to larger businesses and those belonging to small businesses. The market would cover 1178 individual facilities. It did not include consumer products or mobile sources, although, once again, a legacy vehicle-scrapping program was included.¹⁵⁶ Businesses

153. See Interview with Anupom Ganguli, *supra* note 145.

154. See *id.*

155. See VU ET AL., *supra* note 70, at EX-7.

156. See *id.* at 5-13.

of all sizes were represented, from small paint shops to large motor vehicle and aerospace facilities.

This article will again look primarily at the allocations of VOC permits for individual facilities. Calculation of allocated permits followed the same principle as under the NO_x/SO_x program. There were two reference points for allocations for this market: starting and ending allocations. Other years' allocations were again based on a straight-line reduction between these two reference points. Again, all allocations were calculated by multiplying an activity level of an individual facility by emission factors. The main difference between the NO_x/SO_x and VOC markets arose in the details of the activity levels and emission factors.

The activity levels used to calculate a facility's allocation of VOC credits was equal to peak reported activity levels from 1990 to 1995, inclusive.¹⁵⁷ All of these years were affected somewhat by the recession that hit the Los Angeles Basin in 1990. Activity levels from 1989 were included in calculating allocations for NO_x/SO_x credits, but they were explicitly not used here.¹⁵⁸ District staff did not use the 1989 level because the staff felt VOC RECLAIM could not comply with the clean air acts if 1989 activity levels were included. Under the allocations proposed by District staff for VOC RECLAIM, 1999 allocations were essentially equal to actual emissions by the VOC RECLAIM facilities in 1993.¹⁵⁹ However, if 1989 activity levels were included in determining allocations, the total quantity of allocations would not reach the 1993 level of actual emissions until the year 2001, and allocations for 1999 would have exceeded 1993 levels by approximately 25 percent.¹⁶⁰ District staff felt that these excesses, and in particular having 1999 allocations significantly higher than 1993 emissions, would have substantially violated the reasonable further progress clause in the federal CAA.¹⁶¹

Under this clause, in 2000 the District would need to show that total actual emissions in 1999—including non-RECLAIM sources—had declined by three percent per year.¹⁶² District staff expected that if allocations for RECLAIM sources in 1999 exceeded 1993 levels, this excess

157. See *id.* at 5-15.

158. Recall that 1989 was less affected by the severe recession suffered by the Los Angeles Basin.

159. See S. Coast Air Quality Management Dist., Steering Committee Meeting (Dec. 5, 1995) (Slide: VOC RECLAIM Allocations vs. Reported Emissions on file with author).

160. See *id.*

161. See Interview with Anupom Ganguli, *supra* note 145.

162. See Clean Air Act Amendments of 1990, 42 U.S.C. § 7511a (1994) (describing 3 percent rule).

would trigger environmental and public health groups to sue under the clean air acts.¹⁶³

Additionally, District staff was concerned with problems of monitoring VOC sources. Because of poor monitoring, District staff felt that actual emissions from these sources could be higher than the amount represented by allocated permits.¹⁶⁴ For District staff, this concern increased the likelihood that environmental groups would be triggered to sue if 1989 activity levels were included.¹⁶⁵ Consequently, the District decided to not use 1989 levels to calculate peak activity levels.¹⁶⁶

Meanwhile, emission factors for VOCs were also calculated in a slightly different way than for NO_x/SO_x. Starting emission factors for VOCs were calculated similarly to starting NO_x/SO_x factors. The starting emission factors (called "control factors" in VOC RECLAIM documentation) were used to calculate allocations for 1997.¹⁶⁷ These factors represented implementation of existing rules with compliance dates by the end of 1996.¹⁶⁸

However, ending emission factors for VOC, used to calculate 2005 allocations, were not based on previously adopted rules, because there were no existing rules with future implementation dates for VOCs. Instead, these factors were developed based on "implementation of existing technologies and short term control measures of the 1994 AQMP."¹⁶⁹ These "measures" were general descriptions of expected technological improvements. Because these measures were not specific, the District could not use these to directly calculate emission factors. A further investigation of available technologies was needed.

Toward this end, the District conducted a Technology Assessment and released its results in October 1995.¹⁷⁰ The District constructed this assessment by discussing prospects for future emission reduction technologies with vendors of the technologies—i.e. companies whose purpose is to develop and market new abatement technologies—and a few companies that might use these technologies.¹⁷¹ This procedure did not require the same level of evidentiary support as a CAC hearing. It also did

163. See Interview with Anupom Ganguli, *supra* note 145.

164. See *id.*

165. See *id.*

166. See *id.*

167. See VU ET AL., *supra* note 70, at EX-8.

168. See *id.*

169. See *id.* at EX-9. The measures this refers to are the twelve "Potential Substitute Measures" (CTS-A through CTS-L) in chapter four of the 1994 AQMP. See 1994 AQMP, *supra* note 28, at 4-6 tbl. 4-1.

170. See VU ET AL., *supra* note 70, at EX-6.

171. See CHAURUSHIYA ET AL., *supra* note 76, at 3-12 (listing "key contacts").

not provide industry opponents the opportunity, also available during CAC hearings, to present contrary evidence. Nevertheless, it was essential for this assessment to be constructed quickly and inexpensively, so these procedures were unavailable.

While conducting this assessment, staff found that the opinions of vendors on whether a particular technology would be available were frequently in conflict with the opinions of companies that might use those technologies.¹⁷² Because of their prior experience with claims of technology forcing, District staff discounted the objections of industry users, when they claimed that a technology would not be available.¹⁷³ When faced with discrepancies on whether a technology would be available, District staff felt constrained to follow the claims of the vendors.¹⁷⁴ After making these decisions on the availability of future technologies, District staff then determined final emission factors on the basis of the conclusions reached in this assessment.

4. Large and Small Business Groups' Response to This Proposal

Business groups' preference between RECLAIM and CAC depended upon which had lower expected costs, and hence would lead to higher profits. These costs depended on the expected total amount of pollution, self-enforcement costs, uncertainty, and the compliance cost advantages of one instrument vis-a-vis another.

The article will first examine whether large businesses felt that their emissions would be more restricted under RECLAIM than under CAC. This comparison depends on whether there were differences in activity levels and emission factors between what was used to calculate allocations for VOC RECLAIM and what businesses might expect under future CAC. Large businesses felt that the activity levels used by the District were too low.¹⁷⁵ They expected to eventually recover from the recession, and that activity levels would return to their non-recessionary levels.¹⁷⁶ These higher activity levels would be allowed under CAC, because CAC regulations are set in terms of an average emissions rate, not an emissions cap. As the region's economic activity picked up, a facility could triple its activity levels, and still be in compliance, as long as that facility's emissions rates complied with the regulation. On the other hand, peak activity levels used by the District to calculate RECLAIM allocations were lower than non-

172. See *id.* at 3-1 to 3-12, 11-3 to 11-7; see also Interview with Anupom Ganguli, *supra* note 145.

173. See CHAURUSHIYA ET AL., *supra* note 76, at 3-1 to 3-12, 11-3 to 11-7; see also Interview with Anupom Ganguli, *supra* note 145.

174. See Interview with Anupom Ganguli, *supra* note 145.

175. See REGULATORY FLEXIBILITY GROUP, *supra* note 23, at 11 (1996).

176. See *id.*

recessionary levels. Large businesses, therefore, expected higher activity levels under CAC than were used in calculating RECLAIM allocations.

Large business groups also disagreed strongly with the District's assessment of the development of future BARCT technologies.¹⁷⁷ They expected that technologies would develop more slowly than the district predicted.¹⁷⁸ The groups, therefore, expected that the future emissions factors used by District staff to calculate future RECLAIM allocations would be lower than the corresponding emission factors they would face under CAC. Combining these, we see that large businesses expected that RECLAIM would involve a significantly lower quantity of permits than under CAC.¹⁷⁹

In addition to these concerns of large businesses, small businesses also felt that the amount of pollution that they would be allowed to emit under RECLAIM was substantially lower than under future CAC.¹⁸⁰ In their prior experiences with CAC, they were able to comply by simply adopting the recommended technologies. These regulations sometimes increased their costs so much that they were forced to reduce their production levels.¹⁸¹ On the other hand, when these businesses discovered that they would have significantly fewer permits in 2005, many were certain they would have to either shut down or move elsewhere.¹⁸² This concern was exaggerated by the lack of environmental compliance staff. This staff would have been more familiar with the expected development of abatement technologies. If they were available, compliance staff could have explained to small business operators that technological advances should account for a great percentage of this reduction in permits.

In addition to higher costs from lower quantities of permitted emissions, these small businesses also expected to have higher enforcement costs under RECLAIM. Environmental groups had urged the District to include certain record-keeping features in the rules for RECLAIM, in order to demonstrate that the program complied with the federal and California clean air acts.¹⁸³ One such feature was that each user would have to "attach a unique identifying number to each can of paint or solvent, and to obtain

177. See *id.* at 15-16.

178. See *id.*

179. See Letter from Robert Wyman, Partner, Latham & Watkins, to Dale B. Thompson, Visiting Assistant Professor, Virginia Tech (Aug. 20, 1997) (on file with author).

180. See SMALL BUSINESS COALITION, RECLAIM: THE SMALL BUSINESS PERSPECTIVE 15 (1992); see generally ECLECTICA, A SURVEY OF ATTITUDES AND OPINIONS OF PROSPECTIVE REGIONAL CLEAN AIR INCENTIVES MARKET PARTICIPANTS (1993).

181. See ECLECTICA, *supra* note 95 at 29.

182. See *id.*

183. See Telephone Interview with Robert Wyman, *supra* note 61; Letter from Robert Wyman to Dale B. Thompson, *supra* note 179.

complete VOC data from the manufacturer."¹⁸⁴ Businesses did not expect to be forced to comply with this very costly requirement under CAC.

Another problem with VOC RECLAIM for these businesses was that they would bear the burdens of substantially higher risks compared to CAC.¹⁸⁵ Perhaps the most significant risk faced by small and large businesses related to uncertainties in technological development. There were significant probabilities that the VOC abatement technologies, which were used to calculate future emission factors, might not develop. Some of the more troubling technologies involved paint coatings and adhesives.¹⁸⁶ Reducing emissions with these products is not accomplished by cleaning emissions at the end of production as is the case with scrubbers for NO_x/SO_x. Instead, a chemical reformulation of the product itself must be used.¹⁸⁷ New formulations may not meet the performance standards required for the products: coatings and adhesives may not adhere correctly if reformulated to comply with emissions regulations. This problem is exacerbated by the high performance requirements of military contracts with companies in the Los Angeles Basin.

Businesses face much lower risks from uncertainties in technological development under CAC. Except for "technology forcing" regulations, before a particular technology is adopted under CAC, the District staff must demonstrate that it is technologically and economically feasible. In addition, there are mechanisms that reduce the burdens of uncertainty even for technology-forcing regulations. After a technology-forcing regulation has been in operation, if new evidence shows that the technology does not work appropriately, the requirement of that technology can be reevaluated. Thus, while businesses do not bear these risks under CAC, they would under RECLAIM. Particularly because of the large risks associated with future VOC abatement technologies, these businesses, therefore, faced higher costs of capital.

On the other hand, large businesses also recognized the potential static and dynamic compliance cost advantages of RECLAIM as an economic-incentive-based policy.¹⁸⁸ However, they felt that the restriction in the scope of VOC RECLAIM significantly reduced the opportunities for cost savings.¹⁸⁹

184. Letter from Robert Wyman to Dale B. Thompson, *supra* note 179.

185. Recall that risks affect capital costs.

186. See REGULATORY FLEXIBILITY GROUP, *supra* note 23, at 15.

187. See *id.*

188. For further discussion of static and dynamic advantages of incentive based policies, see Dale B. Thompson, *An Examination of the Consequences of Political, Administrative, and Legal Institutions on the Implementation and Performance of Environmental Policies* 37, 39-40 (1998) (unpublished Ph.D. dissertation, Stanford University) (on file with author).

189. See Telephone Interview with Robert Wyman, *supra* note 61.

Thus, business groups expected to face higher costs under RECLAIM compared to CAC, because of lower total discounted amounts of permits, higher self-enforcement costs, and higher capital costs because of the burdens of risky technological development. Small businesses expected even higher costs because they expected that the substantial reductions in future permits could frequently force them to either shut down or move elsewhere. These groups did expect some cost savings from RECLAIM as an economic incentive instrument. However, these businesses expected the higher costs from lower quantities of permits and increased monitoring requirements would dominate the potential cost savings from VOC RECLAIM as an economic-incentives-based instrument.¹⁹⁰ As a result, they both voiced their strong opposition to the program.¹⁹¹

5. Environmental and Public Health Interest Groups' Reaction

Once again, environmental and public health groups opposed the VOC RECLAIM proposal.¹⁹² They again believed that the District was allocating too many credits because of the use of peak rather than average activity levels to calculate these allocations. VOC RECLAIM presented an additional problem because some VOCs are toxic. These groups were concerned that VOC RECLAIM would lead to "toxic hot spots" because of trading of VOC credits.¹⁹³ These groups then stressed that elimination of trading of toxics and reductions in allocated credits were necessary to gain their support for VOC RECLAIM.

6. Rejection of VOC RECLAIM by the District Board

Thus, business groups, environmental groups, and public health interest groups opposed VOC RECLAIM. While small businesses were relatively unorganized and could, therefore, impose only limited political costs on the District Board, large businesses were well organized. Meanwhile, between the time of the NO_x/SO_x proposal and the VOC proposal, the composition of the District Board underwent some changes.¹⁹⁴ Due to these changes, the Board became more receptive to the concerns of

190. See Letter from Robert Wyman to Dale B. Thompson, *supra* note 179.

191. See Interview with Anupom Ganguli, *supra* note 145.

192. See generally Feuer et al., *supra* note 79.

193. Under CAC, each facility has a limit as to how much emissions it can produce. Under an emissions market, a single facility is allowed to purchase a large quantity of permits and produce a significantly higher level of emissions. This concentration of emissions can then lead to a hot spot.

194. To see these changes, compare the board composition between the 1994 and 1997 AQMPs, found in each year's AQMP.

industry.¹⁹⁵ In other words, these changes in the composition of the board increased the magnitude of the political costs business groups could impose on the board. In addition to the opposition of business groups, environmental and public health groups again opposed VOC RECLAIM. Within a week of the meeting where business groups announced their opposition, the District Board voted to end the VOC RECLAIM program.¹⁹⁶

V. OBSTACLES AFFECTING THE IMPLEMENTATION OF RECLAIM

The above explanations of the Board's decisions to implement some, but not all, of RECLAIM suggest the following lessons on the political feasibility of emissions markets. One lesson is simply that there will be significant political obstacles to the implementation of emissions markets, contrary to neoclassical economic theory. The theory suggests that there should be efficiency gains from trade by moving toward a more efficient policy instrument and expanding the scope of incentive-based instruments. Because of these gains, Pareto-improving outcomes should be possible in adopting an incentive-based instrument such as RECLAIM, or by expanding its scope. As a result, it should be politically feasible to implement incentive-based instruments like emissions markets. However, our experiences with RECLAIM demonstrate that political barriers remain.

A. Environmental and Public Health Interest Group Opposition Is Not a Sufficient Political Barrier to Emissions Markets

Another lesson is that these political barriers are not directly dependent upon the political opposition of environmental and public health interest groups. Environmental and public health interest groups did play significant roles in the formation of the RECLAIM proposals. Their ability to sue if these plans failed to meet the requirements of the clean air acts acted as a significant constraint on the determination of allocations for RECLAIM. They also played an important role in determining monitoring requirements for RECLAIM. However, beyond these constraints and monitoring concerns, the influence of these groups was limited. These groups voiced strong opposition to both NO_x/SO_x RECLAIM and to VOC RECLAIM. Their concerns were very similar in both cases. In contrast, business groups, for the most part, supported NO_x/SO_x RECLAIM and opposed VOC RECLAIM. In the end, NO_x/SO_x RECLAIM was approved, while VOC RECLAIM was terminated. The rational conclusions drawn

195. See Telephone Interview with Jack Broadbent, *supra* note 126; Telephone Interview with Robert Wyman, *supra* note 61.

196. See Interview with Anupom Ganguli, *supra* note 145.

from these two case studies are that the opposition of environmental and public health groups to RECLAIM was not sufficient to stop the implementation of NO_x/SO_x RECLAIM, and that this opposition played only a small part in the demise of VOC RECLAIM. The political opposition of environmental and public health interest groups is, therefore, an insufficient explanation for the failure to implement an emissions market like RECLAIM.

B. Political Barriers Presented by Consumer Groups

Another lesson concerns the barrier presented by consumer groups. Prior to our experiences with RECLAIM, we would not have expected consumer groups to present significant barriers to the implementation of emissions markets. However, the combination of difficulties in enforcement, the possibility of political entrepreneurs, and representation bias led to the conclusion that it was not politically feasible to include consumer products within the scope of RECLAIM.

The opportunity cost of producing consumer products would rise under RECLAIM because RECLAIM permit allocations would represent a marginal cost of production. The relative inelasticity of demand for consumer products implied that consumers would bear a large portion of the incidence of these increased production costs. The standard means of appeasing groups adversely affected by an emissions market is through grandfathered permits. However, as discussed above, because of difficulties in enforcement, this option was not applicable for consumers of products emitting VOCs. As a result, the consequence of inclusion in RECLAIM for consumers would be higher prices without any compensatory mechanism.

Prior theories might suggest that even though consumers would be harmed by inclusion, they would not have enough political power to prevent their inclusion in RECLAIM. The beneficiaries of the inclusion of consumers in RECLAIM would have been well-organized industries. On the other hand, consumer groups are poorly organized, and are generally rationally ignorant about the consequences of air emission regulations. Nonetheless, through a political entrepreneur, these organization and information problems could be overcome. Once consumers learned of the expected significant increases in prices, they would likely be triggered into a response. Through the organization of the political entrepreneur, this response could be substantial. The significance of this response would be further enhanced by representation bias, because some of the beneficiaries of the inclusion of consumer products resided outside of the District. Meanwhile, the affected consumers would represent a significant proportion of the constituents of the District Board.

It seems that the District Board was significantly influenced by this possibility. Well-organized large businesses strongly supported the expansion of the scope of the market to include consumer products. However, the potential political costs imposed by consumers seem to have led the District Board to conclude that inclusion of consumer products was not politically feasible. Thus, it seems that in this case, groups of consumers using VOC products did have more political clout than closely regulated industrial sources of VOCs.

C. Political Barriers Arising Because of Uncertainty

A final set of lessons concerns increased conflicts caused by uncertainty. Political problems also prevented the use of the more efficient instrument of an emissions market for controlling VOC emissions of business sources. In this case, these problems derived from underlying uncertainty.

Uncertainty is normally thought of as troublesome because of social costs associated with the variance of an uncertain variable. In Martin Weitzman's article,¹⁹⁷ the reason for the advantage of quantity instruments over price instruments was that quantity instruments led to a lower variance with respect to environmental quality.

Uncertainty causes another problem when distributive politics are considered. When trying to estimate an uncertain variable, different groups will have different opinions on that variable's mean. When regulators must choose some estimate of the disputed mean, their choice will necessarily generate distributional consequences.¹⁹⁸ As a result, uncertain variables present potential policy problems not just because of the variances associated with those variables, but also because of potential conflicts over the estimation of their means. In the context of VOC RECLAIM, the primary sources of uncertainty were two variables: activity levels and the future development of abatement technologies.

1. Uncertain Activity Levels

The problem of uncertain activity levels has not been addressed much before. When it was, in Butler and Maher,¹⁹⁹ they found that a quantity-based instrument like RECLAIM achieved an efficient solution.

197. See generally Weitzman, *supra* note 20.

198. The ultimate choice of the estimate will represent a division in allocation. For instance, in estimating technological advances of abatement technology, the estimate of this advance will divide our endowment of environmental quality between sources that pollute and groups that value an unpolluted environment.

199. See generally Butler & Maher, *supra* note 20.

However, their focus was on the social consequences of the variance of activity levels, not their mean.

Experiences with RECLAIM suggest that when the magnitude of the uncertainty pertaining to activity levels is great, determining the expected mean can create significant political conflicts. Under NO_x/SO_x RECLAIM, there was relatively less underlying uncertainty because these businesses were relatively less affected by recessions. Also, the District was not significantly constrained on its choice of the expected mean of activity levels because it did not need to continually reduce emissions, only reach a specified end point. As a result, the estimated activity levels posed a small political barrier, in the form of opposition of environmental groups.

On the other hand, for VOC RECLAIM, there was a significantly greater amount of underlying uncertainty, and much tighter constraints on the District's decision. The estimated means of activity levels chosen by the District for VOC RECLAIM were significantly lower than business groups' estimated means.²⁰⁰ Businesses therefore felt that their burden from uncertain activity levels would be substantial.²⁰¹ This difference of opinion on expected means had significant political consequences because business groups do not bear any burden from uncertain activity levels under CAC. Because of this large discrepancy in burdens, business groups were willing to impose significant political costs on the District if VOC RECLAIM were adopted.

Moreover, in addition to these political problems associated with estimating the mean of uncertain activity levels, we also cannot apply Butler and Maher's²⁰² conclusion that permit systems would be the efficient means for managing the consequences of the variance of uncertain activity levels. Their result depended upon their focus on growth as the source of changes in activity levels. Because growth causes new entrants, the Marginal Abatement Cost (MAC) curve is pivoted out.²⁰³

Recall Weitzman's²⁰⁴ conclusion that whether a quantity or price instrument is more efficient depends on the relative steepness of the MAC curve versus the Marginal Damage (MD) curve.²⁰⁵ Because the pivot makes the MAC curve less steep, quantity-based instruments such as permit

200. See REGULATORY FLEXIBILITY GROUP, *supra* note 23, at 11-14.

201. See *id.*

202. See generally Butler & Maher, *supra* note 20.

203. See *infra* fig.A.

204. See generally Weitzman, *supra* note 20.

205. If the marginal benefit to society of pollution reduction is steeper than the marginal cost of abating that pollution, then a quantity-setting policy instrument will be more beneficial than a price-setting one. Similarly, a price-setting policy instrument will be preferred if the marginal cost curve is steeper than the marginal benefit curve. For further discussion, see Dale B. Thompson, *supra* note 188, at 118.

systems become more attractive than price-based instruments such as taxes. Eventually, as expansion continues, the quantity-based instrument must become the preferred instrument, and this explains Butler and Maher's conclusion.

Our experience with RECLAIM suggests another source: business cycles. While VOC producers were greatly affected by business cycle fluctuations, NO_x/SO_x producers were not, and this difference played a major role in the differential successes of the programs. The importance of business cycles for permit systems was not noted before, because they played no role in our earlier experiences with lead trading and emissions trading. These expansions will have significant implications on the efficiency of pure permit systems. With the business cycle, expansion occurs from greater use of existing capacity. This increased use of existing capacity will not affect the underlying marginal production / reduction of pollution properties of the equipment. What happens instead is that business expansion brings more profitable opportunities, i.e. the price for the primary product rises.

To understand these effects, we can think of the marginal abatement cost curve through its dual production role: pollution as a factor of production, rather than as a by-product. The MAC curve then is actually the marginal revenue product (MRP) curve of pollution. As a business cycle expansion occurs, the marginal physical product (MPP) of pollution does not change, because the underlying equipment and technologies do not change. Recall that the MRP curve is simply the MPP curve multiplied by price. An increase in price, therefore, will simply shift the MRP curve up. Consequently, during a business cycle expansion, as the price of the primary good rises, the whole MRP curve, i.e. the MAC curve, of pollution shifts up.²⁰⁶

This results in different welfare conclusions compared to a pivot. The resulting MAC curve has the same slope as the previous one. Because the relative slopes have not changed, we no longer can say that the permit system has become more attractive, as is the case under the Butler and Maher expansion. Instead, if a tax system was preferable prior to the expansion because the prior MAC curve was steeper than the MD curve, a tax system will remain preferable after the expansion. This is because the new MAC curve must remain steeper than the MD curve, because the slopes of both curves have not changed. We, thus, may reach the opposite conclusion on the efficiency of quantity-based instruments under a business cycle expansion than Butler and Maher's conclusion.

Thus, our experiences with RECLAIM demonstrate that quantity-based instruments may not be the most efficient way to manage losses

206. See *infra* fig.B.

related to the variance of uncertain activity levels. More importantly, these experiences stress the significant political obstacles that arise due to differences of opinion of the expected mean of activity levels. Although earlier analyses focused on the effects of the variances of uncertain variables, RECLAIM points out that distributional political consequences of estimating activity levels have a much more significant impact on the political feasibility of marketable permit systems.

2. *Uncertain Technological Change*

Uncertainties related to technological change have been discussed before. In these earlier analyses, authors noted that permit systems put the risks associated with technological change on polluters.²⁰⁷ Our experiences with RECLAIM suggest that, in addition to these risk factors, differences of opinion over the expected mean of technological advances also result in political obstacles to marketable permit systems.

For NO_x/SO_x RECLAIM, already-adopted rules with future-implementation dates represented a consensus on how quickly future technologies would develop. This consensus implied that there was a small degree of uncertainty associated with the development of abatement technologies for these heavily regulated pollutants. Another consequence of this consensus was that businesses would face the same burden related to uncertain technological change under RECLAIM as under CAC because the CAC rules were the basis for RECLAIM. With no differences in burden, businesses did not have any reason to object to RECLAIM. Thus, when there is a consensus on the future development of abatement technologies, marketable permit systems will not encounter political barriers arising due to uncertain technological change.

However, for VOC RECLAIM, there were no already-adopted rules with future-implementation dates. Instead, there was a large degree of uncertainty concerning the development of VOC abatement technologies. Businesses predicted a very slow development. Technology vendors expected development to proceed much more rapidly, and the District eventually accepted the vendor's views.

Businesses believed that their views would more likely be upheld under the stricter evidentiary requirements of CAC rulemaking hearings. They therefore believed that the District's choice on the expected mean of technological advancements meant that they would face a much higher burden arising from uncertain technological change under RECLAIM.²⁰⁸

207. See generally Roger G. Noll, *Instrument Choice in Environmental Policy* (unpublished manuscript, on file with author).

208. Uncertainty in technological change means that some party will have to bear the burden of this risk.

Because these burdens were significantly different, businesses were willing to impose significant political costs on the District if VOC RECLAIM were adopted.

Again, in addition to the variances of technological change, business groups were very concerned with the estimated means of technological change represented by VOC RECLAIM. Just as with activity levels, our experiences with RECLAIM demonstrate that the distributional political consequences of estimating these means can have a significant impact on the political feasibility of marketable permit systems.

VI. CONCLUSIONS AND IMPLICATIONS FOR FUTURE EMISSIONS MARKETS

Thus, the SCAQMD Board was able to promote considerable efficiencies in the control of NO_x and SO_x emissions by the adoption of NO_x/SO_x RECLAIM. The advantages of this program to large businesses located within the District generated the political support necessary for this program to be implemented. Meanwhile, this program did not trigger effective opposing responses by other groups. Local consumers of electrical power and drivers were not triggered into a response by a political entrepreneur because they expected to be helped and not harmed by the implementation of NO_x/SO_x RECLAIM. The impact of opposition by environmental and public health groups was low because the proposal met the requirements of the federal and state clean air acts, and thus there was no threat of a lawsuit. Other groups that could have opposed NO_x/SO_x RECLAIM were subject to representation bias and, hence, raised no effective response. These conditions enabled this efficient tradable permits program to be implemented for emissions of NO_x and SO_x.

Substantially larger efficiency gains were expected from expanding the scope of RECLAIM to include consumer products and mobile sources. Despite these large efficiency gains, local consumers and drivers could be significantly worse off under the RECLAIM program than under additional CAC regulations. Drivers and consumers would not receive grandfathered permits because it was impractical to distribute grandfathered permits to these groups. Also, the lack of close regulation of these products meant that inclusion in RECLAIM would not offer opportunities for reductions in marginal abatement costs for these products. Instead, the opportunity costs of the RECLAIM permits implied that production costs would rise. The relatively small elasticity of demand meant that local consumers and drivers would bear a significant proportion of the incidence of these higher costs. The expected opposition of these groups stirred up by a political entrepreneur could then present a significant barrier to expanding the scope of RECLAIM. While local businesses would support this expansion and could offer campaign contributions, other groups that supported

expansion were subject to representation bias. As a consequence, it seems that the support of these groups was insufficient to counter the expected opposition of local consumers and drivers. As a result, the District Board decided to not include consumer products or mobile sources within the scope of RECLAIM, despite the large efficiency gains from doing so.

Substantial efficiency gains were also expected from adopting a tradable permits market for the remaining sources of VOC emissions. However, in this case, conflicts arising due to uncertainty prevented the formation of a mutually agreeable compromise for VOC RECLAIM. Future activity levels of VOC sources and the future development of VOC abatement technologies presented significant uncertainties. Feeling constrained by environmental and public health interest groups, the district chose expected means of these variables that differed substantially from the opinions of businesses. Under CAC, businesses would not be subject to the burdens of these decisions. But under VOC RECLAIM, businesses bore all of these burdens. As a result, businesses expected to be worse off under VOC RECLAIM, and they consequently opposed this program. Without any local group supporting it, the District Board decided to forego this efficiency-enhancing policy instrument for additional command-and-control regulations of VOC emissions.

These experiences suggest the following general lessons about the implementability of emissions markets. Prior theories offered an incomplete explanation of the political obstacles faced by emissions markets. The opposition of environmental groups will place certain constraints on the design of emissions markets, but their opposition will not necessarily prevent the implementation of a market that has the support of affected consumers and businesses. Also, as public choice theories suggest, some groups may fight to maintain the status quo of regulation through CAC. However, many affected businesses and regulators themselves may strongly support the implementation of an emissions market, depending on the design of that market. A closer inspection of the determinants of these groups' support is necessary.

As neoclassical economic theories suggest, emissions markets such as RECLAIM offer the potential for substantial efficiency savings. However, adoption of these systems will not necessarily be a Pareto-improving outcome. In particular, end-user consumers of products that were previously less regulated may face large welfare losses compared to the prior regime. These losses derive from increases in production costs that result when the opportunity costs of emission permits are considered. Consumers will bear some of the incidence of these costs, but will not share in the side-payment scheme of grandfathered permits. The magnitude of these losses will rise with relatively low prior marginal abatement costs, low demand elasticities, and high supply elasticities. Nonetheless, even end-user consumers can benefit from emissions markets when

implementation of these markets enables the adoption of lower-cost abatement techniques.

One might think that the support of local consumers might not be necessary to include previously unregulated products within the scope of an emissions market. Consumer groups face the significant problem of organization costs, and many other better-organized groups should be willing to support the market. However, political entrepreneurs may arise to overcome the problem of organization costs, and representation bias may limit the influence of these other groups. Under these circumstances, it is possible that consumer groups could have more political clout than regulated industries. Our experiences with RECLAIM therefore suggest that we must pay careful attention to the possible welfare losses of local consumers from the implementation of an emissions market.

Our experiences also suggest that we must be cognizant of the political implications of estimating means of uncertain variables. This estimation will imply that sources included in a marketable permit system will face burdens that they do not face under CAC. In particular, conflicts over the expected pace of technological improvements will generate considerable political barriers when these technologies have been less regulated previously. These barriers can also prevent the achievement of considerable efficiency savings through emissions markets.

These lessons in turn suggest that two steps are necessary before an emissions market is implemented for VOC emissions in the Los Angeles Basin. The first is that the District must complete a reasonably accurate emissions inventory.²⁰⁹ This inventory will be necessary to identify the source categories that must be targeted in order to achieve the emission reductions required by the federal and state clean air acts. The next step would be the adoption of a comprehensive list of source-specific and product-specific regulations for emissions of VOCs. These regulations would then serve as the baseline for determining allocations of permits under a grandfathered permit system. In other words, before emissions trading could be implemented, the District would first need to implement command-and-control regulations.

With these two steps, the District would significantly reduce the uncertainty faced by businesses under the VOC RECLAIM program. The process of determining these regulations would provide a means for determining a mutually agreeable estimate of the rate of technological progress. With this uncertainty reduced, the VOC RECLAIM program should be more acceptable to businesses. Meanwhile, the adoption of

209. The lack of inventories and the consequential barrier to emissions markets is mentioned in Michael P. Vandenberg, *An Alternative to Ready, Fire, Aim: A New Framework to Link Environmental Targets in Environmental Law*, 85 KY. L.J. 803, 858 (1996/1997).

product specific regulations for consumer products and mobile sources should significantly raise the marginal abatement costs of these sources. Consequently, RECLAIM could then offer opportunities for reducing these costs through alternative techniques. These opportunities would then counterbalance the increased production costs from the opportunity cost of permits. This would significantly reduce the possibility that adoption of an emissions market would trigger a negative response by local consumers, and they might even support implementation of RECLAIM. Thus, while the District Board was unable to achieve these significant efficiency gains with its proposal for VOC RECLAIM, these steps should enable it to overcome the political objections of local businesses and consumers and, thereby, lead to the recapture of these efficiencies.

Similarly, our experiences with RECLAIM suggest certain implications for the future implementation of other emissions markets. It will be extremely difficult to extend these markets to sources and products that were previously unregulated under a CAC regime. The CAC regulatory process frequently leads to a general consensus between regulators and parties affected by regulations on feasible levels of regulation. When a regulatory body attempts to extend an emissions market to cover previously unregulated sources and products, this consensus will not exist, and significant political conflict will result. Additionally, previously unregulated consumers and sources may lack information or the means to process this information concerning the effects of implementing an emissions market. Without an understanding of the effects of an emissions market, these groups may present a serious obstacle to the implementation of an emissions market.

Also, political conflict arising because of uncertainty will be more contentious under emissions markets than under CAC. CAC processes frequently include "escape valves" where prior decisions reflecting the expectation of future developments may be reevaluated when it can be shown that these developments did not occur. The design of emissions markets typically has not included such escape valves. Without these escape valves, affected businesses face significant risks under emissions markets. Additionally, the magnitude of these risks will be extremely high when an emissions market is extended into previously less-regulated sources or products. In these cases, much less is known about the development of future technologies, and the risks from this larger uncertainty are, therefore, much greater.

These lessons suggest that command-and-control regulation may be a necessary prerequisite for the implementation of an emissions market. CAC regulation can thereby provide information and a general consensus that are necessary to achieve a political compromise in the implementation of an emissions market. Additionally, the design of emissions markets needs to include more flexibility, including the opportunity for escape

valves. This flexibility may be needed to address the significant risks arising because of uncertain technological change. With better information, more consensus on future developments, and more flexible design, the political obstacles to emissions markets will be significantly reduced, and these markets will then enable significant improvements in environmental quality at a reasonable cost.

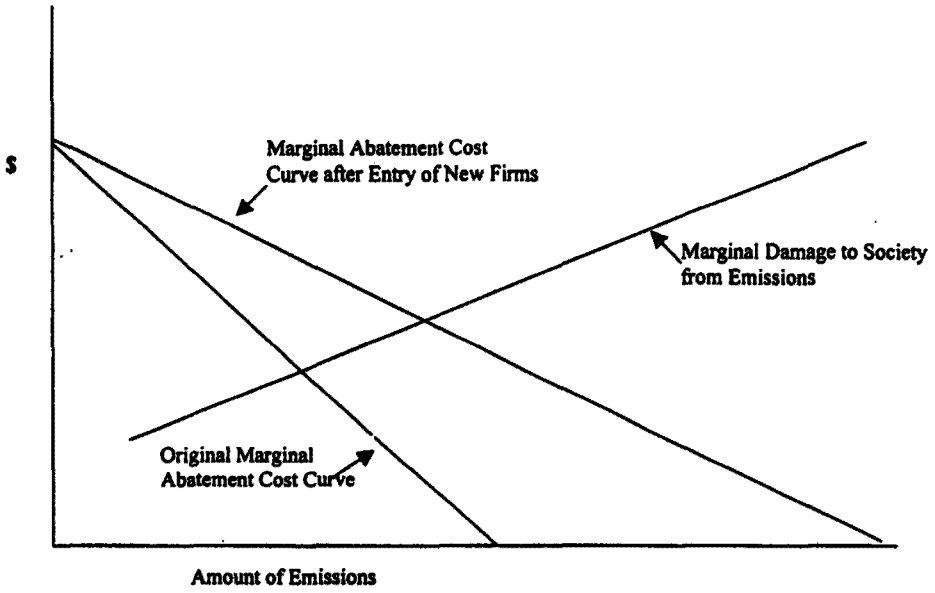


Figure A: Marginal Damage and Marginal Abatement Cost Curves under Growth Caused by New Entrants

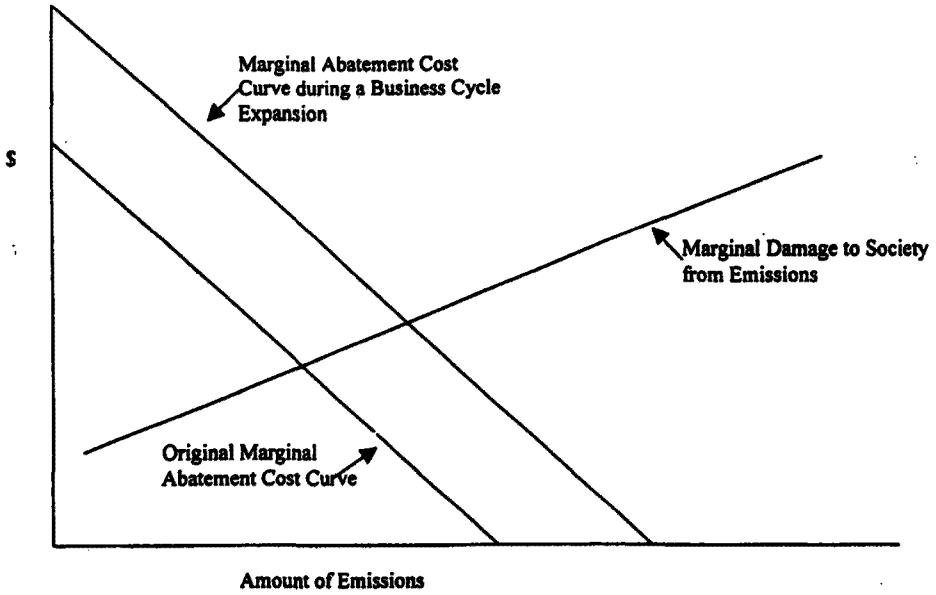


Figure B: Marginal Damage and Marginal Abatement Cost Curves during a Business Cycle Expansion