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Will a Market in Air Pollution Clean the Nation's Dirtiest Air - A Study of the South Coast Air Quality Management District's Regional Clean Air Incentives Market

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Will a Market in Air Pollution Clean the Nation’s Dirtiest Air? A Study of the South Coast Air Quality Management District’s Regional Clean Air Incentives Market

Matthew Polesetsky*

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**INTRODUCTION**

On October 15, 1993, the Governing Board (Board) of the South Coast Air Quality Management District (SCAQMD, or the District)—the California state agency that implements federal and state clean air legislation affecting stationary sources in the Los Angeles...
Air Basin—voted to adopt a radical new approach to achieve clean air in the Nation’s most polluted region. The Regional Clean Air Incentives Market (RECLAIM) is an ambitious marketable permits program aimed at reducing stationary source emissions of oxides of nitrogen (NOx) and oxides of sulfur (SOx) at an average annual rate of 8.3% and 6.8%, respectively, from 1994 through 2003.

The RECLAIM program, which went into effect January 1, 1994, requires the stationary sources that fall under its jurisdiction to reduce their emissions of regulated pollutants each year. Sources may comply with the required mass emission limits by reducing operations, shutting down equipment, or applying facility-selected control technology. The RECLAIM program also allows facilities to reduce their emissions below their allocations and sell the resulting pollution credits to other facilities. The purchasing facility may then exceed its allocations up to the amount of the purchased credits. Several other regulatory programs have incorporated marketable permits to varying degrees in their design.

The purpose of this comment is to provide a descriptive and evaluative overview of RECLAIM. Part I outlines the history of the pro-

1. The District has jurisdiction over the South Coast Air Basin (Basin) and the Los Angeles and Riverside County portions of the Southeast Desert Air Basin (SEDAB). SOUTH COAST AIR QUALITY MANAGEMENT DIST. (SCAQMD) RECLAIM VOLUME III, SOCIOECONOMIC AND ENVIRONMENTAL ASSESSMENTS VII-3 (1983) [hereinafter SCAQMD, RECLAIM SOCIOECONOMIC AND ENVIRONMENTAL ASSESSMENTS]. The RECLAIM rules apply only to the Basin. Id.


3. NOx is a precursor to ozone, for which the Basin is in extreme nonattainment under the scheme established by the Clean Air Act (CAA). SOUTH COAST AIR QUALITY MANAGEMENT DIST. (SCAQMD), RECLAIM DEVELOPMENT REPORT AND PROPOSED RULES 1-5 (1993) [hereinafter SCAQMD, RECLAIM REPORT]. SOx is a precursor for fine particulate matter for which the Basin is also in nonattainment. Id.

4. Id. at EX-3. RECLAIM seeks to achieve an overall reduction of 83% in NOx and 65% in SOx by 2003. Id. at EX-5, II-13; Marla Cone, Activists Urge Rejection of Pollution Credit Plan, L.A. TIMES, Sept. 9, 1993, at A23 [hereinafter Cone, Activists Urge Rejection of Pollution Credit Plan].


6. See Dennis, supra note 5, at 1138.


8. See Robert W. Hahn & Gordon L. Hester, Marketable Permits: Lessons for Theory and Practice, 16 ECOLOGY L.Q. 361, 371-76 (1989) (discussing the use of offsets, netting, and bubbles under the Clean Air Act); the lead trading program; and the trading of water pollution rights under the Clean Water Act); Dennis, supra note 5, at 1101 (discussing the market approach to regulating acid rain pollution found in Title IV of the Clean Air Act Amendments of 1990).
gram, identifying its political origins and explaining why RECLAIM developed when it did. Part II compares command and control regulation to marketable permit trading, as well as discusses the theoretical arguments in favor of and against marketable permits. Part III discusses the design and implementation of a marketable permit program. Part IV presents the arguments for RECLAIM in the South Coast Air Basin (Basin). Part V discusses the details of the RECLAIM program, as well as the possible objections to the design of the program from other perspectives. This comment concludes that RECLAIM offers the greatest hope of successfully reducing stationary source emissions in the Los Angeles Basin.

I

THE HISTORY BEHIND RECLAIM

Los Angeles has the most polluted air in the United States.9 It has been unable to achieve the health-based air quality standards set by the federal government (National Ambient Air Quality Standards, or NAAQS)10 for ozone, fine particulates, carbon monoxide, and nitrogen oxides.11 In 1991, the air quality in the South Coast Air Basin violated one or more federal health standards half of the days of the year.12 These statistics, however, do not tell the full story. Since the 1970's, the air pollution problem in the Los Angeles Air Basin has actually improved in some respects. While the population of the region grew from 9.5 million in 1970 to 13.6 million in 1990, the peak ozone level shrank from .58 to .33 parts per million.13 During the late 1970's, ozone levels exceeded .20 parts per million about 115 days per year.14 The corresponding figure for 1990, 1991, and 1992 was fewer than 50 days per year.15

Recognizing the regional nature of the air pollution problem, the California Legislature established regional air quality control districts to ensure continuing progress in air quality. In 1977, the legislature created the SCAQMD.16 The legislature gave the District jurisdiction

9. Approval and Promulgation of Implementation Plans; California (South Coast Air Basin); Plans for Ozone and Carbon Monoxide, 55 Fed. Reg. 36,458, 36,464 (1990). The South Coast Air Basin has the worst ozone and NO2 levels in the country and also has very high levels of carbon monoxide and particulate (PM-10) pollution. Id.
10. The national primary ambient air quality standards are set at a level sufficient to protect the public health. 42 U.S.C. § 7409 (1994).
12. Id.
13. Id. at 36.
14. Id.
15. Id.
over initiatives to reduce air pollution from industrial sources in Los Angeles, Orange, Riverside, and San Bernadino Counties.  

Environmental groups and some business leaders criticized this arrangement. They accused the District and its Air Quality Management Plans (AQMP's) of being too soft on polluters. In 1987 the legislature restructured the District in response to the criticism. It increased the District's regulatory authority and independence. Currently, the SCAQMD implements federal, state, and local air quality requirements.  

In March 1989, the reinvigorated SCAQMD issued a comprehensive and stringent air quality management plan designed to achieve healthy air in the Basin over a twenty-year period. Among its numerous features, the plan called for increasingly expensive air pollution control measures on stationary sources. Predictably, many business and political leaders opposed the plan. Two factors account for the hostile reaction to the District's plan. First, business leaders feared the growing costs of pollution control. Second, the shrinking of California's industrial base rendered state legislators sympathetic to business leaders' claims of overregulation.  

Faced with such substantial business opposition to its plan, the SCAQMD began to seriously consider other means of pollution control. The marketable permits program soon gained favor. Between the 1989 AQMP and the 1991 AQMP, the District took the first serious steps toward employing market mechanisms to enforce its air 

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17. Id.  
18. Lents & Kelly, supra note 11, at 34-35.  
19. Id.  
20. Id.  
21. SOUTH COAST AIR QUALITY MANAGEMENT DIST. (SCAQMD) & S. CAL. ASS'N OF GOV'TS (SCAG), DRAFT AIR QUALITY MANAGEMENT PLAN: SOUTH COAST AIR BASIN I-5 (1990) [hereinafter SCAQMD & SCAG, DRAFT AIR QUALITY MANAGEMENT PLAN].  
22. Id. at ii, I-5, I-6.  
23. Some business leaders even supported a state senate bill that would have allowed the use of initiative and referendum processes to invalidate District regulations. MIKE DAVIS, CITY OF QUARTZ 202-03 (1992).  
24. See Cone, Activists Urge Rejection of Pollution Credit Plan, supra note 4, at A1.  
25. See Armstrong, supra note 5, at 2, 6. California lost approximately 400,000 manufacturing jobs in the five years leading up to the South Coast Air Quality Management District (SCAQMD) Board of Governors' approval of RECLAIM. Right To Pollute, THE ECONOMIST, Oct. 30, 1993, at 77, 78.  
26. See Armstrong, supra note 5, at 6.  
27. See Marla Cone, AQMD Plan for Blue Skies Turns Hazy, L.A. TIMES, Aug. 21, 1993, at B1 [hereinafter Cone, AQMD Plan Turns Hazy].
control programs. Economists had long praised market mechanisms as a more efficient and cheaper means of achieving clean air.

In 1990, some of the largest polluters in the Basin formed a coalition to explore the opportunities for reducing the costs of complying with the Clean Air Act (CAA), which was then being revised by Congress. The coalition, which came to be known as the Regulatory Flexibility Group (RFG), then launched a campaign for a market-based pollution control program.

In September 1990, the SCAQMD established a task force to consider the desirability of a market-based scheme to reduce air pollution. The RFG enthusiastically supported this move. In November, the Environmental Protection Agency (EPA) established an internal task force to assist the District in developing a marketable permits program. By December, the SCAQMD task force unanimously agreed to recommend to the District’s Governing Board that it conduct a detailed feasibility study of a permit trading program.

28. Wang, supra note 7, at 1151.
29. Marc J. Roberts, Some Problems of Implementing Marketable Pollution Rights Schemes: The Case of the Clean Air Act, in Reform of Environmental Regulation 93, 95 (Wesley A. Magat ed., 1982).
31. Howard Latin, Regulatory Failure, Administrative Incentives, and the New Clean Air Act, 21 Env’t. L. 1648, 1684 (1991). Despite pervasive nonattainment, the 1990 amendments retain the National Ambient Air Quality Standards (NAAQS) approach and reiterate the congressional directive that all nonattainment areas must upgrade air quality to NAAQS levels. As in earlier versions of the CAA, the 1990 amendments mandate revisions of State Implementation Plans (SIP’s) as the central mechanism to promote attainment. Id.
33. The Regulatory Flexibility Group, however, launched its campaign from the rather narrow platform presented by the proposed Federal Implementation Plan (FIP) of the Environmental Protection Agency (EPA) for the region. 55 Fed. Reg. 36,458, 36,462 (1994). The proposed FIP was issued in July 1990. The FIP included a declining mass emissions cap and trading scheme similar to what ultimately developed with RECLAIM. Id. The RFG, however, was not satisfied with the FIP’s trading scheme. The coalition saw the scheme’s market provisions as mere backstop measures that would come into play only when technology-based measures failed to meet federal goals. Id.
34. Interview with Robert A. Wyman, supra note 30.
35. Id.
36. Id. In January 1991, an SCAQMD workshop solicited public comment on a draft proposal of the program. SCAQMD, RECLAIM REPORT, supra note 3, at I-2. In February 1991, the Board accepted the SCAQMD’s recommendation to conduct a feasibility study of the draft proposal. Id.
Committees representing public agencies, and business, labor, environmental, public health, and other groups were established to assist the Board in the development of the marketable permits program. In March 1992, the Board initiated the rule formation process, which eventually took a year and a half to complete.

The District had to contend with two factors that complicated this process. First, the District had to create a program that would comply with federal and state requirements. Second, the District had to formulate a program that would not be so unpopular with any constituency as to threaten its political viability. Not surprisingly, RECLAIM engendered much controversy. Less than two months before the program’s approval, the future of RECLAIM appeared in doubt. The chief opponents of RECLAIM were small businesses who worried that their costs of monitoring emissions would soar. Environmental groups, on the other hand, were concerned that the reductions were not enforceable and that the initial emissions allocations were set too high. RECLAIM did receive support from the

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37. With the assistance of the advisory committees, District staff hammered out five working papers before the Board met on March 5, 1992. At this meeting, the Board held a day-long public hearing to decide whether to begin rule development. SCAQMD, RECLAIM REPORT, supra note 3, at I-3 to I-4.

38. Id.

39. See id. at I-4.

40. To satisfy these objectives, the District repeatedly conferred with representatives from the California Air Resources Board and U.S. EPA. Id. The District also met with the public, including representatives from environmental groups and employees of facilities that RECLAIM would eventually regulate. Id. The first set of draft rules was publicly released in November 1992, but the rules went through many hearings, revisions, and amendments before the final Board vote and approval. Id.

41. Cone, AQMD Plan Turns Hazy, supra note 27, at B1. One SCAQMD Board member was quoted in mid-August as saying: “If the vote were held today, I don’t think it could muster the votes necessary.” Id. To build support for the program, the District held meetings almost daily during this period.

42. Id.

43. Id.

44. Marla Cone, Anti-Smog Plan Praised, Jeered As Hearings Begin, L.A. TIMES, Sept. 10, 1993, at A3 [hereinafter Cone, Anti-Smog Plan Praised, Jeered]. On September 8, the Natural Resources Defense Council, the Coalition for Clean Air, and the American Lung Association—three organizations that had worked closely with the AQMD in developing RECLAIM—announced their opposition to the program. COALITION FOR CLEAN AIR (CCA), COMMENTS REGARDING THE SCAQMD RECLAIM POLLUTION TRADING PROGRAM 1 (1992) [hereinafter CCA, COMMENTS REGARDING RECLAIM]; Clean Air Act in California; The RECLAIM Program: Hearings Before the Subcomm. on Health & the Env’t of the House Comm. on Energy & Commerce, 103d Cong., 1st Sess. 44 (1993) (testimony of Veronica Kun, Staff Scientist, Natural Resources Defense Council) [hereinafter NRDC testimony]; see also Cone, Activists Urge Rejection of Pollution Credit Plan, supra note 4, at A23.
region's largest polluters, as well as from California Governor Pete Wilson and EPA.

In the end, many of the groups that had criticized the program during its development remained unhappy with its final form. Before discussing the details of RECLAIM and the controversies surrounding it, this comment presents the theory behind marketable permits.

II
COMPARISON OF COMMAND AND CONTROL REGULATION TO MARKETABLE PERMITS

A. The Critique of Traditional Command and Control Regulation

Many commentators have seriously questioned whether command and control regulations could have achieved the region's air quality goals. These commentators have identified a number of serious failings of the command and control regime.

First, they claim that command and control is inefficient and unnecessarily expensive because it relies on centralized decisionmaking to achieve pollution control across a myriad of facilities and industries. By imposing uniform requirements, command and control largely ignores the substantial differences among facilities' pollution abatement costs. If pollution reduction targeted only those sources that could reduce most cheaply, billions of dollars could be saved.

Second, the centralized decisionmaking characteristic of command and control may fail to allow detection of viable pollution control techniques. Under command and control regulatory regimes, the bureaucrats choosing the technical solutions may not be the parties that have the best information on the feasibility of pollution con-

45. At an AQMD hearing on September 9, 1993, many of the largest and most influential polluters in the region endorsed RECLAIM. See Cone, Anti-Smog Plan Praised, Jeered, supra note 44, at A3.
46. Id.
47. Cone, Activists Urge Rejection of Pollution Credit Plan, supra note 4, at A1.
49. See, e.g., Richard B. Stewart, Economics, Environment, and the Limits of Legal Control, 9 HARV. ENVTL. L. REV. 1, 7 (1985) [hereinafter Stewart, Limits of Legal Control]; Ackerman & Stewart, supra note 48, at 1335.
50. Stewart, Limits of Legal Control, supra note 49, at 7.
51. Ackerman & Stewart, supra note 48, at 1335.
52. PETER S. MENELL & RICHARD B. STEWART, ENVIRONMENTAL LAW AND POLICY 415-17 (1994).
control technologies and the cost of potential solutions.\(^{53}\) Plant managers and engineers, on the other hand, are generally the most familiar with the operations of their facilities and are in the best position to discover viable new pollution control technologies.\(^{54}\) Under command and control regimes, however, these individuals have no incentive to develop or implement new abatement technologies\(^{55}\) since any new abatement technology a firm develops may become the basis for more stringent command and control requirements, thus driving up the firm's operating costs.\(^{56}\)

Third, the process of determining pollution control requirements under command and control is long and tortuous.\(^{57}\) This process serves to seriously delay the attainment of statutory objectives because regulators must collect and analyze information about control technologies for each class of polluter. Not only must regulators determine which control technologies actually function properly, they must also ensure that those technologies are economically feasible.\(^{58}\)

High costs make pollution reduction under command and control very unpalatable. The regulated community responds by using litigation and political pressure to resist the regulations to the best of its ability.\(^{59}\) Pollution control then becomes even more problematic, because sympathetic regulators do not vigorously implement legislation that causes significant social or economic dislocation or that encounters substantial political opposition.\(^{60}\) Regulated industries often challenge the regulators' decisions as to a measure's technological and economic feasibility.\(^{61}\) Usually, these disagreements are genuine. But because pollution control can be so expensive, businesses may find it worthwhile to oppose regulations for purely strategic reasons.\(^{62}\) This

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53. Ackerman & Stewart, supra note 48, at 1343.
54. Id.
56. Stewart, Limits of Legal Control, supra note 49, at 9; see also Dwyer, supra note 55, at 65.
57. See MESELL & STEWART, supra note 52, at 238.
58. Ackerman & Stewart, supra note 48, at 1335-36; Stewart, Limits of Legal Control, supra note 49, at 4-5.
59. See infra notes 65-66 and accompanying text.
60. Latin, supra note 31, at 1657-59. For instance, California has not produced a State Implementation Plan satisfying the requirements of the Clean Air Act since the statute was passed in 1970. Wang, supra note 7, at 1139. The federal government has likewise resisted writing a Federal Implementation Plan for the Basin. See Coalition for Clean Air v. Environmental Protection Agency, 971 F.2d 219, 228-29 (9th Cir. 1992) (requiring EPA to promulgate a FIP over the Agency's objections).
61. See MESELL & STEWART, supra note 52, at 235.
62. Ackerman & Stewart, supra note 48, at 1336.
likelihood of legal challenge forces air control agencies to develop paper trails to justify their regulations.63

In addition to challenging the feasibility of control standards at the development stage,64 polluters have successfully evaded implementation of environmental requirements. To enforce environmental standards, regulators may be forced to resort to court actions.65 Given the difficulty of forcing regulations on businesses that are willing and able to resist, an air control agency might decide that the wisest course of action is compromise, even when the compromise position is far from ideal.66

The history of command and control regulation largely bears out the validity of these criticisms. Since Congress passed the Clean Air Act in 1970, revised deadlines for achieving NAAQS have come and gone in 1975, 1982, and 1987.67 One court branded the history of the CAA as a "potpourri of postponements, revisions, extensions and suspensions."68 If command and control continues to be the chief pollution control strategy for the Los Angeles Air Basin, there is little reason to expect any break in this pattern of repetitive disappointment. While command and control would undoubtedly continue to effect some improvements in pollution control, the same pattern of litigation and delay would surely resurface and prevent the District from attaining the best possible level of clean air.

B. The Arguments for Marketable Permits

The goal of pollution control policy is to clean the air; the difficult questions are how this end should be achieved, how much should be spent on control, and how the goal of clean air should be weighed against other social goods. The answers involve difficult balancing of important values such as the economic impact on, and equity among, the parties involved. These parties include both the polluters and the residents of polluted areas. The monetary and nonmonetary costs that governmental agencies are willing and able to impose on society

63. Stewart, Limits of Legal Control, supra note 49, at 6; Latin, supra note 31, at 1667-68.
67. MELNICK, POLLUTION DEADLINES, supra note 64, at 91-94.
to achieve clean air further limit the goals of an air pollution control program.

The theoretical underpinning of marketable permits is that the polluters, rather than the government, are in the best position to determine the most cost-effective pollution controls.\(^{69}\) Marketable permits thus also stimulate firms to make technological advances in pollution abatement.\(^{70}\) If firms are able to market and realize profit from emission reductions achieved beyond their emissions allocations, they have an incentive to make available such extra units of credits through technological innovation.\(^{71}\)

Institutional barriers, on the other hand, prevent the typical command and control scheme from attaining the successes possible under a well-designed marketable permits program. Under a command and control scheme, a government agency requires all sources within a given category to institute certain pollution control technology.\(^{72}\) Differing technologies may be required for differing source categories. As a result, the cost necessary to reduce the same level of pollution may vary widely from one source to another. For instance, eliminating three tons of annual \(NO_x\) emissions for one type of facility may require installing and maintaining scrubbers at a cost of $10,000 per year. Another facility that utilizes a different production process may be able to achieve the same emission reductions for just $5000 per year. If the regional air authority mandates that both sources eliminate annually three tons of \(NO_x\) each, each of these sources must implement these differing control technologies. Complying with this mandate costs the businesses a total of $15,000.

Compare this result with that which would be possible under a permit trading program. Hypothetically, a trading scheme allows the facilities to cooperate to achieve the least-cost solution. For example, the second source, which is more efficient at cutting emissions, reduces its \(NO_x\) emissions by six tons—three tons of reduction to comply with its own emissions limitations, and three additional tons of reduction for commodification and sale on the market. The first source then purchases credits representing three tons of \(NO_x\) reduc-

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69. Because operators of stationary sources have the most comprehensive understanding of their own facilities, they are best positioned to uncover the most rational methods of pollution reduction. See Robert W. Hahn & Roger G. Noll, *Environmental Markets in the Year 2000*, 4 J. RISK & UNCERTAINTY 351, 352 (1990) [hereinafter Hahn & Noll, *Environmental Markets*].

70. See Dwyer, supra note 55, at 65.


72. Robert W. Hahn, *Innovative Approaches for Revising the Clean Air Act*, NAT. RESOURCES J., Winter 1988, at 172 (stating that by limiting the total number of emission permits, a given level of environmental protection can be achieved).
tion from the second source. The total cost of this reduction is $10,000. Like the command and control scheme, the marketable permits program eliminates six tons of pollution. However, the marketable permits program obtains this result at one-third less cost.

A tradeable permit system encourages efficiency by using a market in pollution allowances to equalize the marginal costs of control among diverse sources.73 As shown above, a tradeable permit system commodifies and creates a market price for units of pollution reduction.74 Such units, or trading credits, are usually measured in terms of pounds of pollutants emitted.75 Supply and demand determine the market price for trading credits in the same fashion these forces would for other factors of production.76 Sources generate supply when they sell their trading credits after scaling back production, installing control equipment, or otherwise reducing emissions below their allocation.77 Sources generate demand when they purchase trading credits.78

The interaction of supply and demand ensures that the cost of pollution reduction would not exceed the market price of a trading credit. Every source has an incentive to reduce emissions up to the market price of a trading credit, because it can then turn around and sell the credit on the market at a profit.79 For some sources, installing control technology to achieve their allocation limits may be more expensive than the market price of a trading credit. These sources would rationally respond to this phenomenon by entering the market and purchasing pollution credits.80 Thus, the marginal cost of pollution reduction will be equalized among different sources.81 Moreover, prices are equalized across industry lines because the market for trading credits serves all types of industry.82

C. The Arguments Against Marketable Permits

The preceding discussion of marketable permits theory assumes that the underlying concept of pollution "rights" is morally acceptable. Nonetheless, a number of views raise moral objections to pollu-

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73. See Dennis, supra note 5, at 1109, 1112.
74. Roberts, supra note 29, at 94-98.
75. For example, a Reclaim Trading Credit is denominated in pounds of NOₓ or SOₓ.
77. See MENELL & STEWART, supra note 52, at 49.
78. BRIAN J. COOK, BUREAUCRATIC POLITICS AND REGULATORY REFORM: THE EPA AND EMISSIONS TRADING 62-64 (1988); MENELL & STEWART, supra note 52, at 50-51.
79. MENELL & STEWART, supra note 52, at 50-51.
80. See Dennis, supra note 5, at 1115.
81. Id.
82. Id.
tion trading. Some object to permit trading because they feel that pollution is a social evil akin to robbery or assault. Others object because they view pollution as a dangerous health hazard. Under such views, it is difficult to accept the notion that anyone should ever gain a "right" to pollute. Rather, adherents of these perspectives believe that polluters should be stigmatized, and that society should tolerate pollution only to the extent that a doctor would tolerate cancer.

Moral arguments against the concept of pollution rights, however, have become less popular. In the debate over RECLAIM, only Citizens for a Better Environment (CBE) raised moral objections to the program. Other major environmental groups endorsed the concept of marketable permits, although they questioned many of RECLAIM's specific features.

Another criticism of efforts to reform environmental law has been that reformers are overly concerned with devising theoretical solutions to environmental problems, rather than with developing programs that are truly workable. For instance, any system of marketable permits relies heavily on the assumption that pollution discharges can be accurately monitored. Yet critics of marketable permits systems have been dissatisfied with the purported ability of current technologies and systems of governmental administration to deal with the monitoring problem. In fact, the original version of RECLAIM regulated reactive organic compounds in addition to NOx.

83. Errol Meidinger, On Explaining the Development of "Emissions Trading" in U.S. Air Pollution Control Regulation, 7 LAW & POL'Y 447, 460-61 (1985). Environmentalists have been generally divided about the use of market mechanisms. The division splits environmentalists into two camps: moralists and pragmatists. Id. Moralists view pollution as a moral wrong and, therefore, feel that it is inappropriate to grant anyone the right to pollute. Id. Pragmatists see pollution as a problem of social organization that should be solved in the most practicable manner possible. Pragmatists support the use of market mechanisms to the extent that they effect a practical reduction in pollution levels. Id.


85. Id.


87. See Meidinger, supra note 83, at 460-61; Hahn & Stavins, supra note 48, at 23-24.

88. Meidinger, supra note 83, at 461.

89. CBE found it an "unacceptable proposition that anyone, anywhere, ever has a right to poison the air of their neighbors." JENAL, supra note 84, at 6.

90. CCA, COMMENTS REGARDING RECLAIM, supra note 44, at 1-2; NRDC testimony, supra note 44, at 44-45.

91. Latin, supra note 31, at 1649-55; Ackerman & Stewart, supra note 48, at 1361-63.

92. For a discussion of an effective enforcement regime in a marketable permits program, see infra part III.C.

93. JENAL, supra note 84, at 9-10.
The regulation of reactive organic compounds under RECLAIM was eliminated largely because of concern about monitoring.

III
DESIGN AND IMPLEMENTATION OF A SUCCESSFUL MARKETABLE PERMIT PROGRAM

Proponents of marketable permits have identified a number of requirements for a successful marketable permit program. First, a sufficient number of buyers and sellers of emissions credits must exist. Second, transaction costs for the transfer of emissions credits must be minimized. Third, there must be an adequate system of monitoring and enforcing the permits system. Finally, market participants must have confidence in the stability of the regulatory system.

A. Market Density

Without enough participants, a competitive market will not develop. Unless sufficient buyers and sellers participate in the market, price information may be difficult to establish and prices at which credits trade may not accurately reflect supply and demand. Individual sellers may not be able to locate individual buyers and vice versa. When the prospects of selling the extra credits are uncertain, firms lose their incentive to reduce emissions beyond their required levels. In addition, large polluters may be able to exert unfair market power in a small market.

B. Transaction Costs

Transaction costs may substantially increase the cost of transferring credits and discourage otherwise mutually beneficial trades. According to one observer, transaction costs in the SCAQMD’s limited pre-RECLAIM emission trading program ran as high as 30% of the market value of the credits. Robert Hahn and Gordon Hester

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94. RECLAIM Rule 2013 (proposed Mar. 8, 1993).
95. Cone, AQMD Plan Turns Hazy, supra note 27, at B1.
96. Menell & Stewart, supra note 52, at 70-74; Robert W. Hahn & Roger G. Noll, Designing a Market for Tradable Emissions Permits, in Reform of Environmental Regulation, supra note 29, at 119, 121 [hereinafter Hahn & Noll, Designing a Market].
97. Menell & Stewart, supra note 52, at 57-63.
98. Roberts, supra note 29, at 102.
99. Id. at 103-06; Hahn & Noll, Designing a Market, supra note 96, at 121.
100. Dwyer, supra note 55, at 76; Tripp & Dudek, supra note 86, at 376.
102. Dennis, supra note 5, at 1136.
103. Hahn & Noll, Designing a Market, supra note 96, at 119, 121.
104. Tripp & Dudek, supra note 86, at 377; Dwyer, supra note 55, at 66.
105. Dwyer, supra note 55, at 66.
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identified high transaction costs as the single most important obstacle to the success of pollution markets.106

High transaction costs can have a number of causes. Administrative burdens are one cause.107 Some programs that have incorporated the use of marketable permits, for example, require facilities to obtain approval from the regulatory agency before transferring any emission right.108 The time and effort needed to secure regulatory approval only add to the cost of the emission credit. Firms may absorb this additional cost by reducing their profits on a sale or they may pass the additional cost on to the pollution-right purchaser by increasing the price of the credits.

Establishing the number of emissions credits that the seller holds is another source of transaction costs.109 This problem frequently arises when emissions trading is superimposed on a larger system of command and control regulation. Hahn and Hester describe this problem as follows:

Firms commonly achieve compliance by installing the technology on which their permitted emission level is based. Although this approach may be adequate for regulation of sources that do not trade, it is not well-suited to those firms that do trade, because it does not provide accurate information on actual emission levels for the purposes of establishing the quantities of property rights being traded. To create emission credits, a source must calculate its reductions in emissions, a process that often requires the source to develop costly new information.110

Under a full-scale marketable permits program, the problem of divergent information costs between trading and nontrading firms vanishes. Since all sources are required to install emissions monitoring devices and to quantify emissions, they face similar information constraints and costs regardless of whether they trade.111

C. Effective Enforcement

To maintain the advantages of a market-driven program, effective enforcement is necessary. Effective enforcement has two components: monitoring and sanctions.112 Without effective enforcement of the rights created by the pollution market, the market will become

106. Hahn & Hester, supra note 8, at 376.
107. Id. at 378.
109. Hahn & Hester, supra note 8, at 377.
110. Id.
111. SCAQMD, RECLAIM REPORT, supra note 3, at III-3 to III-7.
112. William Drayton, Economic Law Enforcement, 4 HARV. ENVTL. L. REV. 1, 12-16 (1980). For a discussion of RECLAIM's enforcement tools, see infra part V.H.
distorted and inefficient. The emission credits must be well defined and limited. If facilities can cheat on these credits, demand for the credits will atrophy, their value will crash, and incentives for innovation will disappear. Worst of all, air quality will improve very little or even deteriorate as sources pollute in excess of the permitted amount.

Unlike most consumer markets, the pollution market is created by governmental regulations. While most consumer markets have internal enforcement mechanisms, enforcement of the pollution market must be external to be effective. In markets for computers, apples, or cars, buyers naturally have strong incentives to ensure that sellers actually give them the product for which they have contracted. A pollution market is fundamentally different, however, because the buyer has no real interest in whether the seller has made the claimed emissions reductions. The emissions market is not self-policing; regulators must strictly enforce the emissions limits.

D. Regulatory Stability

A tension exists in a marketable permit scheme between the participants' need for stability and the regulator's need to modify the rules to accommodate changed conditions and new information. While uncertainty is common in most markets, it takes a unique form with pollution markets. In the pollution market, the government commodifies pollution credits by fiat. The credits retain their value only if the government maintains the market.

Regulatory stability, therefore, is needed for the market to function properly. As discussed earlier, pollution credit markets operate on the assumption that polluters will develop rational responses to the incentives that the market creates. Sources that find it extremely costly to reduce their emissions have an interest in negotiating with sources that can reduce emissions relatively inexpensively. This process of pollution credit transfer requires planning. Planning, in turn, requires the ability to predict the future with some degree of certainty. If market participants believe that regulators will whimsically change the rules of the market, firms lose the ability to plan for the future. In the worst case scenario, market participants may fear that regulators

113. See Drayton, supra note 112, at 5-12.
115. Dwyer, supra note 55, at 73; Tietenberg, supra note 71, at 401.
116. Enforcement is effective only when the potential cheater calculates that the cost of abiding by the law is less than the probability of getting caught multiplied by the subsequent penalty. See generally Hahn & Noll, Environmental Markets, supra note 69, at 353.
117. Roberts, supra note 29, at 94.
118. Dwyer, supra note 55, at 71.
119. See supra notes 69-80 and accompanying text.
will confiscate the credits that the participants generate. This may cause participants to lose much of their incentive to reduce emissions beyond the legal requirement.

For a pollution market to realize its goal of cleaning the air, however, regulators must retain the ability to modify the rules of the market when changing information or conditions necessitate such action. Because the pollution market is simply a means to achieve overall pollution reduction, the market should be molded by regulatory choice to accomplish this desired outcome. Ideally, the regulators will set the rules at the beginning of the program, and only minimal modifications will be made during the course of the program. However, some adjustments are both likely and necessary.

As long as such modification is based on substantial justifications that are publicly discussed, the pollution market should be able to adjust as any other market would. The tension between the necessity for secure pollution rights and the need for regulatory flexibility may well be the central dilemma of emissions trading. These two program features must be balanced.

IV
ARGUMENTS FOR RECLAIM IN THE SOUTH COAST AIR BASIN

Several policy factors support the adoption of RECLAIM. These factors include the increasing cost of abatement measures, consensus about the required level of pollution control, confidence in the feasibility of a marketable permit program, and a conducive legal environment.

A. Increasing Costs of Pollution Abatement Measures

First, the growing costs of pollution control and the inefficiency of command and control regulations stimulate interest in alternate methods of addressing environmental concerns. Politicians and regulators are sensitive to business peoples' claims that environmental controls are slowing economic growth. The symbiotic relationship between concern over economic growth and the use of market mecha-

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120. See Dennis, supra note 5, at 1124-25.
121. See Dwyer, supra note 55, at 71, 73.
122. Id. The SCAQMD's record in achieving that balance in its non-RECLAIM emissions trading program, however, has not been promising. Id. at 71. The Agency has frequently and unpredictably changed its offset rules, including confiscating credits that firms had accumulated by reducing emissions. Id.
123. Hahn, supra note 72, at 170-73.
124. See generally Armstrong, supra note 5, at 6. AQMD officials are concerned that more expensive pollution abatement measures under the command and control regulations would jeopardize the financial viability of smaller regulated entities within the Basin. Id.
isms is not new. In 1976, EPA instituted one of the earliest emission trading programs in response to claims that compliance with the Clean Air Act stifled economic growth. Under EPA's offset policy, new sources may locate in a nonattainment area if they have acquired offsetting emission reductions from polluters within that area. Absent this policy, the CAA would prohibit new sources from locating in nonattainment areas.

By the mid-1970's, state agencies and EPA were under considerable pressure to achieve environmental protection without sacrificing economic efficiency. Robert Hahn and Roger Noll point out the following:

The demand for innovative, cost-effective responses increases as the cost of controlling pollution increases. It also increases as the cost of the command-and-control approach increases relative to a market-based approach. There is widespread agreement that, at least in the United States, most of the relatively low cost fixes for controlling pollution have already been implemented. Thus, markets present an attractive alternative for enterprising politicians who wish to identify alternative paths that could lead to greater environmental quality at lower cost.

In other words, as pollution control becomes more expensive, cost-effective market-based solutions become increasingly attractive. In the South Coast Air Basin, where the need for pollution abatement is at its highest, cost concerns are pressing. The District forecast that the implementation of the 1991 AQMP would cost an average of $138.7 million annually over the five-year period between 1994 and 1999. The estimated annual cost of implementing RECLAIM for the same period and at the same target level of pollution control is $80.8 million. This figure represents a savings of approximately 42% over the command and control approach.

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125. Hahn & Hester, supra note 8, at 372.
126. Id.
128. Meidinger, supra note 83, at 462.
130. SCAQMD, RECLAIM REPORT, supra note 3, at V-10. Business leaders have argued that compliance with the Clean Air Act would reduce productive capacity in southern California by $2 billion per year. Interview with Robert A. Wyman, supra note 30.
131. SCAQMD, RECLAIM REPORT, supra note 3, at EX-19.
132. Id. at V-10. Nonetheless, the cost savings of a permit trading program must be fairly well distributed among industries so that companies of different sizes and types stand to profit. RECLAIM was strongly attacked on this front. Cone, AQMD Plan Turns Hazy, supra note 27, at B1. Small business had mixed feelings about the program. Cone, First U.S. Smog Market, supra note 2, at A1. The Southern California Gas Company assumed a leadership role in arguing that big business would capture most of the program's benefits. Cone, AQMD Plan Turns Hazy, supra note 27, at B1. Ultimately, the Governing Board rejected the inequity argument of small business. The Board declined to adopt a provision
B. Consensus About Required Level of Pollution Control

A second important factor that facilitated RECLAIM's development was widespread recognition of the need to attain a certain level of pollution control. The state and federal clean air statutes, backed by strong public support, require that the District attain healthful air quality. The 1989 and 1991 Air Quality Management Plans demonstrated that the District was serious about attaining this goal. The federal judiciary also appears willing to enforce the federal mandate for clean air. In a 1987 court order, the Ninth Circuit required EPA to disapprove California's State Implementation Plan (SIP) because EPA failed to demonstrate that California would attain NAAQS for carbon monoxide and ozone by the statutory deadline. The result was the 1989 AQMP, which established specific targets for stationary source pollution reduction. Absent this consensus about the need for pollution control, the possibility of agreeing on the details of a market incentive program would have been slight.

C. Confidence in Feasibility of a Marketable Permit Program

A third factor that contributed to RECLAIM's development was confidence in the feasibility of a marketable permit program. This factor in turn depends on several variables: the experience of environmental regulators with marketable permits, the competence of the regulatory agency responsible for enforcing the program, and technical feasibility. All of these conditions were satisfied prior to RECLAIM's development. As discussed above, the District has experience administering the emission offset program under the CAA. While RECLAIM goes far beyond the emission offset program in its use of a market system, the District has gained valuable experience from its administration of the offset program. In addition, the District is one of the largest, most expert, and well-staffed air

that would have modified RECLAIM to give smaller sources the option of joining RECLAIM or staying with command and control. Id.

134. See, e.g., SCAQMD & SCAG, DRAFT AIR QUALITY MANAGEMENT PLAN, supra note 21, at ii.
135. Abramowitz v. Environmental Protection Agency, 832 F.2d 1071 (9th Cir. 1987).
136. Id.
138. Id.
139. See Dwyer, supra note 55, at 59-66.
140. See supra notes 125-27 and accompanying text.
141. As discussed above, the District's record in administering the offset program has been checkered. See supra note 122 and accompanying text. This does not mean, of course, that the District has not learned from its earlier mistakes.
control agencies in the country. Finally, the development a number of years earlier of monitoring devices necessary for an emissions trading program ensured technical feasibility. Thus, the District's experience with an emissions trading program, its ability to administer a sophisticated and large-scale program, and the availability of monitoring devices all created confidence in RECLAIM's feasibility.

D. A Supportive Environmental Protection Agency

EPA's support of RECLAIM was the fourth factor that facilitated the development of the program. The trend toward market incentives partially explains EPA's supportive position. According to one commentator, the spread of a novel regulatory culture helps to explain regulators' support for marketable permits. A central value of this culture is that regulatory decisions should be based "insofar as possible on the interests and compromises of private parties." Whatever the reasons for EPA's position, the Agency's endorsement of RECLAIM surely helped create momentum for the program's development. EPA's endorsement and its assistance in designing the program may also prove useful if RECLAIM faces a likely legal challenge.

THE RECLAIM PROGRAM

One main purpose of RECLAIM is to reduce the overall costs of pollution control without sacrificing the primary goal of cleaning the air. RECLAIM is designed to achieve the same air quality goals set out in the 1991 command and control AQMP, but at lower costs. The method of determining allocations under RECLAIM, in particu-
lar, illustrates how RECLAIM incorporates the objective of achieving equivalent results with the 1991 AQMP.150

The history of RECLAIM indicates that cost-effectiveness was a central motivation behind the program’s development. The SCAQMD sets out clearly the purpose of RECLAIM:

The goal of RECLAIM is to achieve the emission reduction objectives for the Basin by providing facility operators with the flexibility to choose how to make emission reductions, thereby lowering compliance costs and providing incentives for the development of air pollution control technologies. Implementation of RECLAIM will reduce emissions from sources in the program to the same extent that they would be required to reduce emissions through implementation of existing regulations and the Air Quality Management Program (AQMP). RECLAIM is designed to ensure that the program achieves equivalent emissions reductions, an equal or greater level of enforcement, lower implementation costs, fewer job impacts, and no adverse public health impacts, compared to the existing program.151

As this passage indicates, proponents of RECLAIM believe that creating a market for pollution will achieve pollution reduction goals in a more efficient, and hence cheaper, fashion. Indeed, the theory underlying RECLAIM argues that the market mechanism can achieve results that might otherwise have been impossible under command and control.152 The program accomplishes these results by giving polluters greater flexibility in reducing emissions.153

The program features are set out in twelve rules. These rules include the scope of the program; the methodology for determining credit allocations; requirements for participation; regulations for new and modified sources; permit requirements; the nature of the RECLAIM Trading Credit (RTC); mobile source credits; administrative, civil, and criminal penalties; monitoring, reporting, and recordkeeping (MRR) requirements; and backstop provisions.

A. The Scope of RECLAIM: The Number of Participants

RECLAIM Rule 2001 establishes the scope of the RECLAIM program. Certain facilities enter RECLAIM on a mandatory basis and others on a voluntary basis.154 Generally, the Executive Officer

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150. Id. at EX-5.
151. Id. at I-1.
152. Dwyer, supra note 55, at 60-61; Menell & Stewart, supra note 52, at 376. Growing recognition of the failure of command and control strategies and the costs of regulation has refocused attention on economic incentives approaches. See Menell & Stewart, supra note 52, at 376.
153. SCAQMD, RECLAIM REPORT, supra note 3, at EX-2 to EX-4.
154. RECLAIM Rule 2001(b)-(c) (1993); SCAQMD, RECLAIM REPORT, supra note 3, at II-7.
of the SCAQMD (Executive Officer) includes all facilities\textsuperscript{155} that emitted four or more tons per year of either NO\textsubscript{x} or SO\textsubscript{x} in 1990 or any year thereafter.\textsuperscript{156} While there is a provision for facilities that do not emit four or more tons per year of NO\textsubscript{x} or SO\textsubscript{x} to enter RECLAIM voluntarily,\textsuperscript{157} facilities may not leave RECLAIM once they become part of the program.\textsuperscript{158}

The NO\textsubscript{x} program of RECLAIM will regulate approximately 390 facilities, representing about 65\% of total emissions from permitted stationary sources.\textsuperscript{159} The SO\textsubscript{x} program of RECLAIM will regulate approximately 41 facilities, representing about 85\% of total emissions from permitted stationary sources.\textsuperscript{160} While only a small percentage of facilities participate in RECLAIM,\textsuperscript{161} the facilities account for the vast majority of NO\textsubscript{x} and SO\textsubscript{x} stationary source emissions in the Basin.\textsuperscript{162} Limiting participation to the larger facilities helps keep the program size manageable while allowing the program to regulate most of the region’s stationary source emissions.\textsuperscript{163} Also, effective partici-

\textsuperscript{155} A “facility” is defined as “any source or grouping of sources or other air contaminant-emitting activities which are located on one or more contiguous properties within the Basin in actual physical contact, or separated solely by a public right-of-way, and are owned or operated by the same person.” RECLAIM Rule 2000(c)(32) (1993).

\textsuperscript{156} RECLAIM Rule 2001(b) (1993). For the purpose of establishing whether the facility has emitted four or more tons of NO\textsubscript{x} or SO\textsubscript{x}, emissions from certain sources are excluded from the count. These sources include: sources exempted from a permit; rented process units with a valid District permit issued to a party other than the facility; onsite, off-road mobile sources; and SO\textsubscript{x} sources that burn natural gas exclusively. RECLAIM Rule 2001(b)(1)(A), (b)(2)(A), (b)(1)(B), (b)(2)(B), (b)(1)(C), (b)(2)(C), (b)(2)(D) (1993).

\textsuperscript{157} RECLAIM Rule 2001(f) (1993).

\textsuperscript{158} RECLAIM Rule 2001(g) (1993). A number of sources, however, are prohibited from entering RECLAIM. RECLAIM Rule 2001(i)(1) (1993). These facilities include drycleaners, fire fighting facilities, facilities that have converted all sources to operate on electric power prior to October 15, 1993, and police facilities. Id.

\textsuperscript{159} SCAQMD, RECLAIM REPORT, supra note 3, at II-4 (fig. 2-1).

\textsuperscript{160} Id. at II-5 (fig. 2-2).

\textsuperscript{161} The NO\textsubscript{x} program of RECLAIM sources accounts for only about 6\% of all NO\textsubscript{x} stationary source facilities in the Basin, while the SO\textsubscript{x} program of RECLAIM regulates only about 4\% of the SO\textsubscript{x} facilities in the Basin. Id. at II-4 to II-5.

\textsuperscript{162} Id. at EX-3, EX-5, II-2.

\textsuperscript{163} Id. at II-3; see also DAVID HARRISON, JR. & ALBERT L. NICHOLS, NATIONAL ECONOMIC RESEARCH ASSOC., INC., MARKET-BASED APPROACHES TO REDUCE THE COST OF CLEAN AIR IN CALIFORNIA’S SOUTH COAST BASIN E-3 to E-5 (1990). Larger facilities have more sources and thus greater flexibility to stay within their allocations. If one source is very expensive to control, the facility may locate another source that is relatively inexpensive to control. The larger facility may then be able to cover emissions from one of its sources with reductions from another. The facility, therefore, may at times avoid resorting to the market with its attendant transaction costs. Small facilities, on the other
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pation in RECLAIM requires a degree of regulatory sophistication that may be lacking in smaller facilities.164

On the other hand, the RECLAIM program is more inclusive than other proposals, such as the proposal by the Southern California Gas Company (SoCal Gas). SoCal Gas, one of the most prominent opponents of RECLAIM, objected to the size of the facilities included in the program.165 It argued that RECLAIM should be mandatory only for very large sources of pollution166 and optional for smaller facilities.167 This approach, SoCal Gas argued, would shrink the universe of NOx emissions regulated by RECLAIM by only 10% to 15%.168 The District, therefore, would still be able to achieve major emission reductions under the program, which presumably would be easier to administer with fewer facilities included. The SCAQMD Board, however, rejected SoCal Gas' suggestion to limit the scope of RECLAIM.169

The SoCal Gas alternative was appropriately rejected because there was insufficient reason to reduce the number of market participants and thereby thin the program's market density.170 Not only would RECLAIM reach approximately 10% to 15% less emissions under the SoCal Gas alternative, at least 10% to 15% fewer polluters would participate under this alternative.171 A thinner market, resulting from fewer participants and fewer pollution rights being traded, would jeopardize the overall health of the market172 and lead to limited inter-firm trading.173

hand, likely have only one source. If that source is an expensive one to control, the facility will have to enter the RECLAIM Trading Credit (RTC) market or install the necessary control technology. The options that small sources have are thus more limited than the alternatives available to large sources. HARRISON & NICHOLS, supra, at E-14 to E-26.

164. See MENELL & STEWART, supra note 52, at 415. The large sources can provide the necessary capital to enter the market, while the smaller firms often lack the necessary finances to fund their reductions and obtain in return emission credits. Id.


166. SoCal Gas defined very large sources of pollution as those emitting at least 50 tons of NOx per year. Id. at 1-2.

167. SoCal Gas claims that RECLAIM should be mandatory for facilities producing 50 to 100 or more tons of NOx per year. Facilities below 50 to 100 tons of NOx per year, SoCal Gas argues, could remain under the AQMP controls or choose to participate in emissions trading under RECLAIM. Id. at 1.

168. Id. at 2.

169. RECLAIM Rule 2001(b), (c) (1993). The SCAQMD's rejection of SoCal Gas' proposal is evident in their adoption of Rule 2001, which includes all sources emitting four or more tons per year of NOx or SOx.

170. Telephone Interview with Jill Whynot, Program Supervisor for RECLAIM (Nov. 4, 1994).

171. Id.

172. See Dwyer, supra note 55, at 64-65.

173. Id.
Although it is difficult to determine the precise point at which the declining number of participants would lead to market failure, the market should function more effectively the thicker it is. Absent compelling evidence that certain facilities should be exempted, the protection of market density is a sound rationale for maintaining a wide scope for RECLAIM.

**B. Determining Credit Allocations**

1. **Theoretical Approaches**

One of the most important and controversial parts of a marketable permit scheme is the allocation of pollution credits. The creation and distribution of pollution rights tend to stir conflict among different interests both inside and outside the regulated community. The pollution rights allocated determine the rate and level of pollution reduction a facility must achieve to comply with emission standards. From the viewpoint of a regulated facility, the allocation may well dictate the level of production at which it may operate. The allocation also represents a substantial addition or reduction of wealth. The total annualized value of the permits is equal to the number of permits issued multiplied by the annual price people are willing to pay to hold a permit for one year. The initial allocation of permits is therefore an implicit allocation of a considerable amount of wealth.

Three main methods can be used for the initial distribution of permits: allocation based on existing or historical emissions, allocation through an auction, and allocation based on simulation of a competitive market result. Hahn and Noll have evaluated allocation methodologies based on the methodologies' ability to stimulate an active

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174. MENELL & STEWART, supra note 52, at 415-16; see Tietenberg, supra note 71, at 398-99.
175. Hahn & Noll, Designing a Market, supra note 96, at 137-38.
176. See Tietenberg, supra note 71, at 399.
177. Id. at 400. Presumably, the existing system has assigned emission control requirements consistent with achieving ambient standards. If permits in an expanded system are initially allocated to emitters so as to allow each polluter the right to pollute as much as was previously allowed under the ambient standards, then any transfers among emitters that take place after the initial allocation will result in mutual gains for those who are trading and will dictate the level of production for the facility. Id.
179. Id. at 131.
180. Id. at 132.
181. Thomas Tietenberg conceptualized the possibilities along a spectrum: "[O]n one end of the spectrum the entitlement to discharge is reserved for the control authority (and granted to emitters only upon receipt of their payment) while on the other it is reserved for the emitters (and granted to the control authority only upon receipt of adequate compensation)." Tietenberg, supra note 71, at 399.
market and allow a market price to develop quickly. The early location of an equilibrium price, according to Hahn and Noll, will facilitate long-term planning by the regulated facilities. The chief alternatives, in descending order of propensity to satisfy the equilibrium price criteria, are allocation through an auction, allocation based on historical or existing emissions, and allocation based on regulators' prediction of a competitive market result.

Theoretically, an auction might be the preferred method for distributing credits. Businesses, however, will likely oppose having to pay for permits in addition to actual abatement expenses. Hahn and Noll explain this reaction as follows:

[E]missions taxes or public auctions of emission permits have had limited acceptance because they involve payment by polluters for the inframarginal units of emissions—that is, the emissions that are permissible because they do not cause noncompliance with overall environmental quality objectives. To polluters, paying for emissions that do not cause harmful pollution (at least in a legal sense) is inequitable and confiscatory.

A more politically palatable method is to base allocations upon preexisting control requirements, which represent a fair starting point for future emission reductions. The preexisting command and control requirements provide an exogenous, objective benchmark. Allocating pollution rights based on these requirements, moreover, may minimize the discontinuity of switching to the new system. Under this allocation methodology, nobody is made worse off under RECLAIM than under command and control. Facilities that have been prompt in meeting the preexisting control requirements are not penalized for their diligence, while facilities that have been delinquent will enter RECLAIM with insufficient credits to maintain preexisting levels of production.

Rule 2002 sets forth the methodology for calculating allocations for facilities covered by RECLAIM. Under the rule, the facility permit establishes annual allocations for the years 1994 through 2010. In determining facility allocations, Rule 2002 applies a three-
step process. First, the rule calls for the calculation of allocations for the years 1994, 2000, and 2003.\textsuperscript{193} Second, the rule requires that allocations for the years between 1994 and 2000 and between 2000 and 2003 be reduced annually on a straight line basis.\textsuperscript{194} Third, the rule specifies that the facility allocations must plateau from 2003 to the last year of the program.\textsuperscript{195} Accordingly, the allocation levels reached in the year 2003 should reflect the air quality goals of RECLAIM. In addition, Rule 2003 allows the District Governing Board to reduce allocations further if the Board considers a reduction necessary to achieve air quality goals.\textsuperscript{196}

The RECLAIM allocations were designed to achieve emission reductions equivalent to reductions that would have been attained under the command and control requirements of the 1991 AQMP.\textsuperscript{197} Specifically, RECLAIM is designed to be equivalent to the implementation of Tiers I\textsuperscript{198} and II\textsuperscript{199} of the 1991 AQMP.\textsuperscript{200}

2. **Methodology for Initial Allocations**

The basic formula for determining starting allocations applies to both $SO_\text{x}$ and $NO_\text{x}$ emissions.\textsuperscript{201} Allocations are calculated for each different type of equipment within the facility and subsequently aggrega-

\textsuperscript{194} Id.
\textsuperscript{196} Id. The Board must revise the allocations in accordance with the AQMP process and with RECLAIM Rule 2015(b)(1), (b)(3), (b)(4), or (c). The Board's discretion is limited to those reductions that are cost-effective and technologically feasible. RECLAIM Rule 2003(b)(3) (1993).
\textsuperscript{197} SCAQMD, RECLAIM REPORT, \textit{supra} note 3, at II-11.
\textsuperscript{198} Tier I of the 1991 AQMP represents the implementation of existing control technologies. These technologies would have been implemented by the year 2000. \textit{Id.} at V-13.
\textsuperscript{199} Tier II of the AQMP represents the implementation of technologies that have not as yet been developed. These technologies would have been implemented by the year 2003. \textit{Id.}
\textsuperscript{200} \textit{Id.}
\textsuperscript{201} \textit{Id.} at II-12. A controversial deviation from the basic allocation formula applies to refineries. The deviation accommodates the refineries' compliance with state and federal requirements to produce reformulated gasoline. RECLAIM Rule 2002(c)(12) requires the facility permit holder to establish the amount of the emission increase resulting from the production of reformulated gasoline. The amount of the allocation increase will be "equal to the increased emissions resulting from the modifications solely to comply with the state or federal reformulated gasoline requirements." RECLAIM Rule 2002(c)(12) (1993). In most cases, the allocation increase will be limited to 5% of the refiner's total allocation. \textit{Id.}

The refineries receiving the extra allocation need not demonstrate that the increased emissions could not have been met with the initial allocation. \textit{Id.} As a result, a refinery may be able to sell the RTC's that it receives under this provision. See \textit{COALITION FOR CLEAN AIR, RECOMMENDED CHANGES TO "REFINEMENTS AND CLARIFICATIONS" DOCUMENT 3-4 (1993)} [hereinafter CCA, \textit{RECOMMENDED CHANGES}]. The language of the July Proposed Rules would have required a refinery to "establish that such increase can not be met through RTCs held by the Facility Permit holder." RECLAIM Rule 2002(c)(11) (proposed draft July 1993). This requirement does not appear in the final rule.
gated to determine the total facility allocation.\(^{202}\) The amount of pollution rights allocated is the multiplicative product of two variables: throughput—a measure of production activity\(^{203}\)—and an emission factor. The starting emission factor represents the level of pollution control achieved by command and control rule reductions required by December 31, 1993, the day before RECLAIM went into effect.\(^{204}\) For the purpose of determining the initial allocation, the relevant year of throughput is the year in the period between 1989 and 1992 in which the facility experienced the highest throughput (i.e., the highest production activity level).\(^{205}\)

In addition to the pounds of NO\(_x\) and SO\(_x\) included in the initial allocation, facilities receive allocations of emissions representing Emission Reduction Credits (ERC's)\(^{206}\) and external offsets.\(^{207}\) Both ERC's and external offsets are immune from reduction through the year 2000.\(^{208}\)

To allow facilities to start RECLAIM at recent production levels, the rules permit facilities to purchase Nontradeable Emission Credits (NEC's) for use in the first three years of the program.\(^{209}\) NEC's represent the emissions necessary to maintain the production levels achieved in 1987 or 1988, if those years brought higher throughput levels than any year from 1989 through 1992.\(^{210}\) Because the price of

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\(^{202}\) SCAQMD, RECLAIM REPORT, supra note 3, at II-12.

\(^{203}\) RECLAIM Rule 2000(c)(64) (1993).

\(^{204}\) SCAQMD, RECLAIM REPORT, supra note 3, at II-12; RECLAIM Rule 2002(c)(1) (1993). The emission factor used for determining the initial allocation cannot exceed the emission factor previously reported by the facility under the District's emission fee-billing program. RECLAIM Rule 2002(c)(2)(D) (1993).

\(^{205}\) RECLAIM Rule 2002(c)(1) (1993); SCAQMD, RECLAIM REPORT, supra note 3, at II-15.


\(^{207}\) RECLAIM Rule 2002(c)(5) (1993). An external offset is an "emission reduction determined pursuant to Rule 1309(b)(1) and approved by the Executive Officer for use to mitigate an emission increase, where the emission reduction is made at a facility other than the facility creating the emission increase." RECLAIM Rule 2000(c)(28) (1993).

\(^{208}\) RECLAIM Rule 2002(c)(3) (1993) (ERC's); RECLAIM Rule 2002(c)(5) (1993) (external offsets). "Non-RECLAIM facilities may not generate RTCs due to a shutdown or curtailment of operations, which occurs after date of adoption, but may generate RTCs if the emission reductions are in excess of current requirements. Also, ERC's generated by non-RECLAIM facilities after the program is adopted may not be converted to RTCs if the ERCs are based on a curtailment of operations after the date of adoption." SCAQMD, RECLAIM REPORT, supra note 3, at II-8.


\(^{210}\) RECLAIM Rule 2002(h)(1) (1993). The maximum yearly throughput level from 1987 to 1988 is reduced by the maximum yearly throughput level from 1989 through 1992. \textit{Id.} This difference in throughput is then multiplied by the starting emission factor. \textit{Id.} The product represents the maximum potential Nontradeable Emission Credits (NEC's)
NEC’s is set at $5000, which is above the expected market price of RECLAIM Trading Credits in the initial years of the program, the District does not anticipate extensive use of NEC’s.211

New facilities (i.e., those commencing operations after RECLAIM came into effect) do not receive emission credits from the District, but must buy them on the open market.212 These facilities must acquire enough RTC’s to offset the emissions at the facility.213

3. Methodology for Allocations in Future Periods

The methodology for fixing year 2000 allocations, found in Rule 2002(d), is similar to the methodology for establishing the initial allocations.214 The emission factor represents the level of control that would have existed by the year 2000 had the District implemented the command and control rules of the 1991 AQMP, and the relevant throughput (i.e., production activity level) is the highest yearly throughput that the facility experienced in the six-year period between 1987 and 1992.215 After adding up the year 2000 allocations of all the RECLAIM facilities, the total emissions allocated should not exceed the year 2000 emission inventory that the 1991 AQMP projected for RECLAIM sources. If the total does exceed the AQMP figure, all the facilities will have their allocations reduced by an equal percentage.216

To determine the allocations for the year 2003, the rules require that each facility’s unadjusted year 2000 allocation be reduced by an equal percentage.217 The year 2003 RECLAIM emission inventory is designed to equal the year 2000 emission inventory projected under the 1991 AQMP.218 The rules do not permit any facility to have a year available to the facility in the first year of operation under RECLAIM. Id. In years two and three, two-thirds and one-third of this maximum, respectively, become available to the facility. Id.

211. SCAQMD, RECLAIM REPORT, supra note 3, at II-21 to II-22. Also, there are additional limitations on the nontradeable credits. The facility may use the credits for increases in throughput only, not for equipment modifications, and the facility must receive written approval from the Executive Officer before using the credits. RECLAIM Rule 2002(h)(2)(A), (C) (1993).


213. Id.


216. RECLAIM Rule 2002(d)(4) (1993). This percentage reduction will not apply to the portion of allocation that derives from ERC’s or external offsets. Id. The year 2000 percentage reduction, however, will be applied to these emissions in 2001 and each subsequent year. RECLAIM Rule 2002(c)(3), (c)(4), (c)(5)(C) (1993).


218. Id.
2000 allocation greater than its initial allocation, or to have a year 2003 allocation greater than its year 2000 allocation.

4. Problems with Initial Allocations

An analysis of RECLAIM's Rule 2002 demonstrates that the difficult process of allocations does not end at the choice of the allocation method (i.e., to base allocation on preexisting control requirements). Complex problems involved in applying the allocation method may arise.

The questions of whether and how to account for preexisting levels of production, for instance, present a wrinkle in the initial allocations process. The formulas for the initial year and year 2000 allocations are designed to avoid locking businesses in recessionary levels of production. While a design that attempts to enable facilities to maintain non-recessionary production levels may have some appeal, such a design raises theoretical and practical problems. One serious problem arises from the divergence of the performance of individual businesses from the performance of the overall economy. The Coalition for Clean Air (CCA) argued that allowing businesses to choose their highest production year from the years 1989 through 1992 for their initial allocation, and from the years 1987 through 1992 for their year 2000 allocation, results in a serious overallocation.

According to the CCA, the overallocation has two causes. First, the recession hardly affected the largest sources of NOx, specifically, oil refineries and electric utilities. Thus, allowing these sources to choose a production level from this period is not justified. Second, the production levels of individual businesses fluctuate much more widely than the production level of the overall economy. When every business chooses its peak production level from a number of years as the basis for determining allocations, an aggregate production level much higher than the actual total level within any given year results. Thus, while RECLAIM facilities emitted 90 tons of NOx per day in 1991 (the economy's peak year between 1989 and 1992), in the program's first year RECLAIM allows 105 tons of NOx per day to

221. SCAQMD, RECLAIM REPORT, supra note 3, at II-12, II-16.
223. Id.
224. Id.; NRDC testimony, supra note 44, at 43-45.
225. CCA, COALITION OPPOSES RECLAIM, supra note 222, at 2; NRDC testimony, supra note 44, at 44-45.
226. CCA, COALITION OPPOSES RECLAIM, supra note 222, at 2; NRDC testimony, supra note 44, at 44-45.
be emitted. To avoid an overallocation, both the CCA and the Natural Resources Defense Council recommended that the District substitute another allocation methodology in place of the current methodology. The suggested methodology bases allocation on a facility's average production level, rather than the peak production level, in the 1989-1992 period.

Overall, RECLAIM's attempt to avoid locking businesses in a recessionary level of production assumes that an allocation of pollution rights will dictate the production level of a facility. The assumption, however, carries weight only if firms do not invest in control methods and technologies. Firms that do invest in control methods and technologies, on the other hand, should be able to maintain non-recessionary production levels while emitting less pollution.

Based on the above allocations, the amount of emissions projected over time under RECLAIM will not be entirely equivalent to the amount projected in the original 1991 AQMP. While RECLAIM will not reduce emissions as quickly as predicted under the 1991 AQMP, the program should achieve equivalency with the 1991 AQMP by the years 2000 and 2003 for NOx and SOx respectively. RECLAIM, however, should achieve equivalent or better results when compared to the "revised 1991 AQMP," the development of which was delayed due to the formulation of RECLAIM.

The California Clean Air Act requires market-based programs to "result in an equivalent reduction in emissions at equivalent or less cost compared with current command and control regulations and future air quality measures that would have been adopted by the District for inclusion in the District's plan for attainment." The District contends, however, that the legislature did not require that reductions "be achieved at the same rate as the subsumed rules and control measures." Rather, according to the District, the state requires that the District's program "not result in a delay in implementing the California CAA."

It is disappointing that RECLAIM is not designed to achieve emission reduction at the same rate as command and control meas-
ures. This failure implies that RECLAIM will delay attainment of the region's clean air goals. The American Lung Association estimated that "real emission reductions will not begin to occur until 1997—six years after the 1991 AQMP was adopted." 236 Observers have blamed the delay on both the overallocation of emission credits and the time-consuming and resource-intensive process of developing RECLAIM. 237

Of course, the above discussion assumes that the District's emissions projections for the AQMP and RECLAIM are accurate. An advantage of RECLAIM, however, is that emission reductions under the program should be more certain than under the AQMP. As discussed more fully above, under command and control there are recurring debates over the desirability and feasibility of individual rules. Political give-and-take, which is especially likely when pollution control becomes more expensive, can result in the compromise of environmental objectives under command and control.

Greater certainty of reduction under RECLAIM also results from the fact that RECLAIM caps overall emissions regardless of the level of economic activity. 238 The accuracy of command and control's emission projections, on the other hand, depends on the accuracy of the economic forecasts that provide the basis for the emission projections. 239 Under command and control, an air pollution control agency, for instance, might conclude that the installation of a certain pollution device on pollution sources is necessary to achieve air quality goals. Even if every pollution source complies with the agency requirements, there is still no guarantee that the desired level of air quality will be attained. The reason is that while command and control may limit the amount of pollutant that results from a given level of production, it does not limit the level of production. If there is strong economic growth and an increase in production levels, air quality objectives will thus be thwarted. RECLAIM's emission projections, on the other hand, should theoretically be more accurate, because the program caps overall emissions regardless of economic activity in the Basin. Thus, even if there is an unexpected level of

237. Id.
238. SCAQMD, RECLAIM REPORT, supra note 3, at II-11, III-4. Emissions reductions for the emissions covered by RECLAIM are equivalent to the adopted rule reductions and the reductions that would be required by the AQMP from participating sources. Id. at III-4.
239. See MENELL & STEWART, supra note 52, at 285.
economic growth, overall emissions are capped at aggregate pollution levels as defined by the quantity of tradeable emission permits.240

Another potential problem with RECLAIM's allocation methodology arises from the technology-forcing component of RECLAIM. RECLAIM would achieve the same levels of reduction by the year 2003 as the 1991 AQMP would require with the implementation of Tier I and Tier II controls.241 Tier II controls, which call for the development of technologies that do not currently exist, represent a technology-forcing component of the AQMP.242 Certainly, basing allocations on technologies that are not yet developed can be risky.243 The program must set realistic goals in order to maximize regulatory stability. If the goals are unrealistic, and compliance with the scheduled allocation reduction becomes onerous, business may exert pressure on District officials to relax the emission limits. If the District succumbs once to the pressure, businesses may predict that they will again succeed in urging changes on the District at another time. They may, as a result, lose some incentive to stay within their allocation. Thus, if the Tier II control requirements are unrealistic, the District's possible tampering with RECLAIM may thwart the achievement of air quality goals.

C. Requirements for Participation

Rule 2004(b) establishes the requirements for facility emissions reports. The compliance year consists of four quarters.244 Thirty days after each of the first three quarters, facilities must submit a Quarterly Certification of Emissions.245 The RECLAIM rules and protocols specify the monitoring techniques used for determining quarterly emissions.246 Within a sixty-day reconciliation period following the last day of the compliance year, facilities must calculate their emissions for the last quarter, buy and sell RTC's, and submit an Annual Permit Emissions Program report.247

240. SCAQMD, RECLAIM REPORT, supra note 3, at III-4 to III-5.
241. Id. at II-13, V-15.
242. Id. at II-13.
243. SoCal Gas, for instance, objected to the inclusion of Tier II technologies in the formulation of RECLAIM's allocations. SoCal Gas, A Fair and Workable RECLAIM PROPOSAL, supra note 165, at 1.
245. Id.
246. RECLAIM Rule 2004(b)(2) (1993). The submission of an inaccurate Quarterly Certification of Emissions constitutes a violation of Rule 2004 for each day of the quarter, unless the facility has corrected the inaccuracy in accordance with District regulations. RECLAIM Rule 2004(c)(1), (c)(2) (1993).
If a facility has exceeded its annual allocation at the end of any of the compliance quarters, the facility may have to pay a penalty. The rules assess the penalty as if the facility had committed a single, separate violation every day of the compliance year. The facility may reduce the number of violations if it can demonstrate the number of days that its emissions went below its allocation.

In addition, Rule 2004(h) imposes a command and control requirement upon all but the smaller electric utilities and industrial and commercial boilers. Effective November 15, 1998, these sources must burn natural gas or a comparably low-polluting fuel as their primary fuel, or use advanced control technology to reduce NOx emissions. This subdivision should conform with requirements imposed by the federal CAA.

D. New and Modified Facilities

1. Authorization and Approval

Rule 2005 regulates the construction and operation of new and modified facilities under RECLAIM. A two-step process must take place before a new or relocated facility can begin operations. First, an applicant must receive authorization from the Executive Officer to construct a new or relocated facility. To receive authorization, the applicant must demonstrate that it will apply the best available control technology (BACT) to all of the facility's sources, and that emissions from the facility will not significantly increase the air concentration of NOx. Second, the applicant must receive approval from the Executive Officer to begin operations at the facility. The applicant must demonstrate to the Executive Officer that it has purchased sufficient RTC's to cover its emissions for the first year of operations. As to a facility seeking to add a new source or to modify an existing source that will lead to an increase in emissions, such a facility must

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249. Id.
250. RECLAIM Rule 2004(d)(2) (1993). In such a case, the remainder of the days in the compliance year, plus one for each 1000 pounds of pollutant or fraction thereof in excess of the facility's allocation, equals the number of violations. Id.
251. RECLAIM Rule 2004(h) (1993). Sources subject to the requirement must emit more than 25 tons of NOx per year. Id.
252. Id.
253. SCAQMD, RECLAIM REPORT, supra note 3, at III-6.
undergo a similar two-step process before it can begin operation of the new or modified source.259

2. **Offset Requirements and Trading Zone Restrictions**

Because the predominant winds blow pollutants from the west to the east, RECLAIM divides the Basin into a western trading zone and an eastern trading zone.260 To offset emissions, a new or relocated facility or a modified existing facility must use RTC's from a facility that meets the trading zone restrictions.261 A facility located in the western zone may offset emissions only with RTC's generated in the western zone.262 A facility located in the eastern zone may purchase RTC's from either, or both, trading zones.263

3. **Overlay of Command and Control Requirements**

To enable RECLAIM to comply with federal and state laws, Rule 2005 overlays substantial command and control requirements onto RECLAIM's market provisions.264 The trading zone requirements of Rule 2005(e), for example, represent the District's attempt to comply with the "sensitive zone" restrictions of state law.265 These restrictions ensure that the different regions within the Basin share the benefits of cleaning the air. The California Clean Air Act, moreover, requires all new and modified sources in nonattainment areas to install BACT.266 Likewise, Rule 2005 imposes this BACT requirement on new and modified facilities.267

Disagreement, however, exists as to whether Rule 2005 is truly consistent with the federal CAA. The new source review (NSR) re-

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259. First, the Executive Officer will approve an application to add or modify a source only if the applicant demonstrates that it will apply the best available control technology (BACT) to the source and that the operation of the source will not significantly increase the air concentration of NO$_2$. RECLAIM Rule 2005(c)(1)(A)-(B) (1993). Second, the Executive Officer will authorize the operation of a new or modified source only if the facility has sufficient RTC's to cover emissions from the source for one year. RECLAIM Rule 2005(c)(2) (1993).

261. Id.
262. Id.
263. Id.
264. SCAQMD, RECLAIM REPORT, supra note 3, at III-11.
266. Id. § 40440(b)(1) (West Supp. 1995).
requirements of the federal CAA, for instance, specify that new and modified major sources in extreme nonattainment areas must achieve the lowest achievable emission rate (LAER).\textsuperscript{268} The federal CAA also requires these sources to achieve emission offsets at a ratio of 1.5:1 when the offsets come from other facilities, and at a ratio of 1.3:1 when the offsets come from internal operations.\textsuperscript{269} Even though Rule 2005 does not require trading ratios higher than 1:1, the District argues that RECLAIM complies with the federal NSR requirements.\textsuperscript{270} According to the District, the federal NSR requirements ensure that new and modified sources do not hinder achievement of air quality goals in nonattainment areas.\textsuperscript{271} RECLAIM's declining mass emissions cap, the District contends, supplies reductions sufficient to satisfy the federal offset requirements and to meet federal NSR objectives.\textsuperscript{272} On the other hand, Citizens for a Better Environment views Rule 2005, without the same offset ratio requirements as the federal CAA, as clearly inconsistent with the act.\textsuperscript{273}

Ideally, the market for pollution rights should not have to carry the extra weight of the command and control requirements contained in Rule 2005. In fact, regulatory reformers have vigorously attacked the NSR provisions of the federal CAA. These reformers argue that the provisions actually retard the replacement of old, dirtier facilities with new, potentially cleaner ones.\textsuperscript{274} Because the stringent NSR provisions do not apply to old facilities, facility managers find it more economical to operate an old facility than to build a new one.\textsuperscript{275} This argument applies with equal force with respect to RECLAIM's NSR provisions.

In the federal NSR regulations, moreover, critics have identified problems not only with the requirement that new and modified sources
sources achieve LAER, but also with the offset ratios. Hahn and Hester discuss the consequences of the NSR offset ratios as follows: "Trading ratios are adverse for offsets because they are always greater than unity. This provision... clearly restricts trading and reduces the number of potentially advantageous trades." 276 RECLAIM, on the other hand, imposes an offset ratio of 1:1, thereby providing the program with more flexibility. 277

The geographical restrictions of Rule 2005 may also impede the market. Although they serve a valuable purpose, the restrictions will reduce the number of trades, because certain trades that would otherwise occur are prohibited under the rule. 278 The regulations, however, may be necessary to meet NAAQS levels in certain portions of the Basin and are therefore amply justified restraints on the market. 279

Overall, these program wrinkles 280 will unlikely pose a serious obstacle to market success since new and modified sources will make up only a minority of the sources that participate in the emission market. 281 The large number of existing facilities, which do not face the NSR restrictions, should generate enough supply and demand to keep the market basically sound.

E. RECLAIM Facility Permit

Rule 2006 describes the RECLAIM facility permit. A facility permit describes every source and emission control device at the facility, the facility allocations for the years 1994 through 2010, and all of the monitoring, reporting, and recordkeeping (MRR) requirements for each source. 282 Facilities have the opportunity to appeal the conditions of their permit. 283

The Executive Officer will decrease an allocation when the facility permit holder sells RTC's according to the RECLAIM trading requirements. 284 A facility's allocation may be increased when the

276. Hahn & Hester, supra note 8, at 376-77.
278. RECLAIM Rule 2005(e) (1993); SCAQMD, RECLAIM REPORT, supra note 3, at III-12.
279. SCAQMD, RECLAIM REPORT, supra note 3, at III-12.
280. The other new source review requirements of Rule 2005 may impair market performance as well.
281. SCAQMD, RECLAIM REPORT, supra note 3, at II-4. The NOx market contains approximately 390 facilities, representing 65% of the total emissions from existing permitted stationary sources. Id.
A STUDY OF RECLAIM

F. The RECLAIM Trading Credit

1. Generally

Rule 2007 defines a RECLAIM trading credit as "a limited authorization to emit RECLAIM pollutants in accordance with the restrictions and requirements of District rules and state and federal law." RTC's are denominated in one pound of a RECLAIM pollutant. The District reserves the right to amend RECLAIM's rules and to suspend, modify, and terminate RTC's.

RTC's have validity only during the year for which they are issued. Once the expiration date has passed, a facility may only use RTC's during the subsequent sixty-day reconciliation period. Rule 2001(d) assigns all RECLAIM facilities to one of two trading cycles. For Cycle 1 facilities, the RTC issue date and expiration date are January 1 and December 31, respectively. The corresponding dates for Cycle 2 facilities are July 1 and June 30. Trading for use in the other cycle does not affect the expiration date of an RTC.

Any person may acquire RTC's. Generally, two requirements govern the acquisition of RTC's. First, the transfer of RTC's becomes effective only when the Executive Officer has amended the District RTC listing. Second, both the buyer and the seller of the RTC must register the transfer with the District.

2. Administrative Review

RECLAIM's trading rules seek to minimize the transaction costs resulting from administrative oversight. Trades, for instance, do

291. The assignment of facilities ensures a relatively equal number of RTC's in each of the cycles. RECLAIM Rule 2001(d)(1) (1993). Cycle 1 facilities have a compliance schedule from January 1 to December 31 of each year, while Cycle 2 facilities have a compliance schedule from July 1 to June 30. Id. RTC's from a facility's allocation are valid only during the facility's compliance year. RECLAIM Rule 2001(d)(2) (1993).
293. Id.
295. The listing is the official record of RTC holding, which specifies all RTC's held by each facility or person. RECLAIM Rule 2007(d) (1993).
297. See SCAQMD, RECLAIM REPORT, supra note 3, at III-17 to III-18.
not have to undergo extensive preapproval by the District. Instead, in the trading scheme the District has the rather narrow role of accounting and tracking of RTC's. Furthermore, locating trading partners will unlikely give rise to substantial transaction costs because of the large number of sources regulated under RECLAIM. The homogeneity of the RECLAIM Trading Credit also limits negotiation costs.

Critics view negatively the minimal administrative review over trading. They feel that such minimal review precludes public participation in the regulatory process. For groups like CBE, this criticism of RECLAIM represents part of a larger philosophical opposition to marketable permits. The criticism runs as follows. Pollution reflects a social problem caused by the decisions of private actors. Social problems in a democracy should resolve themselves through participatory political processes; private actors should not make the political decision of how to solve these problems on behalf of other citizens. The marketable permits system runs counter to this ideal because it places the decisionmaking power not only in private hands, but also in the hands of the individuals who caused the problem in the first place (i.e., the polluters). Under RECLAIM, trades of pollution credits can take place without prior approval and thus public input. Some critics therefore contend that the "community will be in the dark about a facility's pollution plans."

In reality, marketable permits schemes like RECLAIM do not remove decisionmaking entirely from the participatory political process. The decision as to the aggregate amount of emissions that will be allowed into the atmosphere falls on the SCAQMD, and thus ultimately on the public. RECLAIM delegates to private actors only the decision of how best to attain a certain level of overall emissions. So long as the required level of pollution reduction is actually achieved, the decision of precisely how to reduce pollution—e.g.,

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299. SCAQMD, RECLAIM REPORT, supra note 3, at III-18.
300. SoCal Gas, nonetheless, predicts transaction costs of at least 5%. The company bases this figure on the transaction fee level in housing and financial markets. It argues that the District did not adequately take transaction costs into account and that these costs could hamper market development. M. CUBED, SOUTHERN CAL. GAS CO., EVALUATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S SOCIO-ECONOMIC AND ENVIRONMENTAL ASSESSMENTS 7 (1993).
301. JENAL, supra note 84, at 6.
302. See CBE testimony, supra note 273, at 54-55; JENAL, supra note 84, at 5, 14. CBE also claims that RECLAIM circumvents the permit requirements of Title V. See CBE testimony, supra note 273, at 54-55.
303. SCAQMD, RECLAIM REPORT, supra note 3, at EX-12.
304. JENAL, supra note 84, at 14.
305. RECLAIM Rule 2002(c) (1993).
which technologies should be applied in a particular plant—is for the most part a technical one of limited public interest. With RECLAIM, therefore, the total level of emissions going into the Los Angeles Air Basin remains a public decision.

G. Mobile Source Credits

One of the innovative parts of RECLAIM provides for credits for scrapping old, high-polluting vehicles. Rule 2008 allows any person to generate RTC’s by scrapping old vehicles.\textsuperscript{306} Rule 2008 incorporates the requirements of the District rules (1600 series) governing the scrapping of old vehicles.\textsuperscript{307} District Rule 1610 specifies the requirements for scrapper certification, notice, and vehicle disposal and selection.\textsuperscript{308} The rule includes only passenger cars made in 1981 and earlier as eligible vehicles.\textsuperscript{309} To ensure that the mobile source credits represent real reductions in pollution of the Los Angeles Air Basin, RECLAIM Rule 2008 requires that scrapped vehicles must have been operable and registered in the Basin.\textsuperscript{310} In addition, a person scrapping a vehicle must show proof of either one year of continuous insurance coverage for the vehicle or a Basin address dated 1990 or earlier on the pink slip.\textsuperscript{311} Rule 2008 limits to 30,000 the number of vehicles that can be scrapped each year to create RTC’s.\textsuperscript{312}

The inclusion of mobile source credits in a stationary source emissions trading scheme like RECLAIM should be beneficial. In its design of the vehicle scrapping program, the District has done a good job of ensuring that mobile source credits represent real emission reductions. By expanding the sources of supply of emission credits to meet demand, the inclusion of mobile source credits makes pollution reduction more cost-effective.\textsuperscript{313} Moreover, the inclusion of additional sources enhances the thickness, and hence efficiency, of the market.\textsuperscript{314}

H. Administrative, Civil, and Criminal Penalties

1. Sanctions in RECLAIM

The District may impose administrative sanctions as part of the enforcement scheme of RECLAIM. When a facility exceeds its annual allocation, the Executive Officer will reduce the facility’s allocat-

\textsuperscript{306} SCAQMD, RECLAIM REPORT, supra note 3, at III-26.
\textsuperscript{307} RECLAIM Rule 2008(a) (1993).
\textsuperscript{308} SCAQMD, RECLAIM REPORT, supra note 3, at III-24 to III-25.
\textsuperscript{309} Id. at III-25.
\textsuperscript{310} RECLAIM Rule 2008(b)(1) (1993).
\textsuperscript{311} SCAQMD, RECLAIM REPORT, supra note 3, at III-25 (summarizing the District’s vehicle scrapping rules).
\textsuperscript{312} RECLAIM Rule 2008(c) (1993).
\textsuperscript{313} See supra notes 100-03 and accompanying text.
\textsuperscript{314} See id.
tion for the subsequent year by a corresponding amount.315 The Executive Officer may also impose additional restrictions on the facility to ensure that future excesses do not reoccur.316 If the violation is egregious, the Executive Officer may petition the District Hearing Board to revoke the facility's permit.317 Moreover, the Executive Officer may impose an administrative penalty of up to $500 per violation per day for any violation of RECLAIM.318 If the Executive Officer imposes such a penalty, the facility will receive a written explanation describing the basis of the penalty.319 The facility will then have an opportunity to appeal the penalty in a hearing before the Executive Officer.320

2. Sanctions in State Law

State law also provides the District with a variety of civil and criminal enforcement mechanisms. According to the California Health and Safety Code (Code), any person who negligently emits an air contaminant in violation of any air quality control district rule, regulation, or permit has committed a misdemeanor.321 Such person is subject to a fine of not more than $15,000 or imprisonment for not more than nine months, or both.322 Any person who intentionally emits an air contaminant in violation of the law is subject to a fine of not more than $50,000 or imprisonment for not more than one year, or both.323 An extensive array of civil sanctions, moreover, parallel these criminal sanctions under the Code.324 For example, the Code holds any person who emits an air pollutant in violation of a district rule, regulation, or permit liable for civil penalties of up to $10,000.325 Under both the civil and criminal provisions of the Code, every day of violation may be enforced as a separate offense.326 Regulators, there-
fore, have an array of criminal, civil, and administrative enforcement tools at their disposal to obtain compliance with RECLAIM.

3. Incentives for Compliance

Typically, regulators enforce environmental laws through civil and administrative actions. Although criminal sanctions may prove a highly effective enforcement mechanism, they are appropriate in only a limited number of situations. In addition, the prosecutor in a criminal action has to meet a very difficult burden of proof. Thus, regulators rarely depend on criminal actions to enforce environmental laws.

Assuming that the polluter operates as an economic rational actor, the benefit of noncompliance must be less than the probability of enforcement multiplied by the penalty. In other words, the penalty for a violation of a rule or regulation will effectively deter a firm only if it exceeds the benefit of noncompliance. A firm will also factor in the chances of getting caught in assessing the cost of noncompliance. For example, if the economic benefit of noncompliance with a given environmental rule is $10, and the probability of detection is 25%, the penalty must exceed $40 to be an effective deterrent.

Under RECLAIM, the economic benefit of noncompliance with an emission limit simply equals the market price of an RTC. The District has projected that the price of RTC's for NO\textsubscript{x} will not exceed $11,257 per ton between now and 1999. The corresponding figure for SO\textsubscript{x} is $6246. State law requires that the price for either pollutant not exceed $24,000. The RECLAIM penalty, which the following hypotheticals will illustrate, usually exceeds the market price and should provide a strong deterrent to noncompliance. The following hypothetical situations assume that an RTC costs $15,000 per ton, a

327. Drayton, supra note 112, at 1 n.1.
329. See Cheryl Wasserman, Federal Enforcement: Theory and Practice, in Innovation in Environmental Policy, supra note 328, at 21, 24; cf. Drayton, supra note 112, at 6 (arguing that a civil assessment should equal the economic benefit of noncompliance).
331. Wasserman, supra note 329, at 24.
332. SCAQMD, RECLAIM Socioeconomic and Environmental Assessments, supra note 1, at VI-10.
333. Id.
figure substantially higher than what the District has predicted for the foreseeable future.\textsuperscript{335}

In the first hypothetical, assume a small facility emitted one half ton of pollutant in excess of its allocation for a period of ten days. Under RECLAIM, the facility thus committed a total of eleven violations.\textsuperscript{336} If the District assesses the strict liability civil penalty of $10,000 per violation against the facility, the facility's maximum civil penalty is $110,000. If, on the other hand, the facility had purchased RTC's for the one half ton of excess pollutants, it would only have had to pay $7500. For the $110,000 penalty to serve as an effective deterrent to noncompliance, the probability of detection by the District must only exceed 7\%.\textsuperscript{337}

In the second hypothetical situation, assume a larger but still small facility emitted an excess of two tons over a twenty-day period. In this scenario, the probability of detection necessary for effective deterrence must exceed 12.5\%.\textsuperscript{338} In a third hypothetical situation, if a medium-sized facility emitted an excess of twenty tons over twenty days, the probability of detection for effective deterrence must exceed 50\%.\textsuperscript{339} Under a fourth scenario, assume a large facility emitted an excess of one hundred tons over ten days. The relevant threshold probability of detection is approximately 70\%.\textsuperscript{340}

\begin{itemize}
\item \textsuperscript{335} SCAQMD, RECLAIM Socioeconomic and Environmental Assessments, \textit{supra} note 1, at VI-10.
\item \textsuperscript{336} For the purpose of assessing a penalty under RECLAIM, the number of violations for which a facility may be fined is the sum of: (1) the number of days or portion thereof (in the compliance year) in which a facility exceeds its allocation, plus (2) one violation for each 1000 pounds of pollutant or fraction thereof in excess of the facility's allocation. RECLAIM Rule 2004(d)(2) (1993).
\item \textsuperscript{337} The 7\% probability is calculated by dividing $7500, the market price of an RTC, into $110,000, the maximum civil penalty. The market price of an RTC represents the economic benefit of noncompliance, while the maximum civil penalty multiplied by the probability of detection represents the economic cost of noncompliance.
\item \textsuperscript{338} Here, the facility committed a total of 24 violations (20 violations for 20 days plus four violations for 4000 pounds in excess). The facility thus faces a maximum civil penalty of $240,000. If the facility had purchased RTC's for the two tons of excess pollutants, it would only have had to pay $30,000 ($15,000 multiplied by two tons). Dividing $30,000 into $240,000 yields 12.5\%, which the probability of detection must exceed to ensure effective deterrence.
\item \textsuperscript{339} In this situation, the facility committed a total of 60 violations (20 violations for 20 days plus 40 violations for 40,000 pounds in excess). The facility thus faces a maximum civil penalty of $600,000. If the facility had purchased RTC's for the 20 tons of excess pollutants, it would only have had to pay $300,000 ($15,000 per ton multiplied by 20 tons). Dividing $300,000 into $600,000 yields 50\%.
\item \textsuperscript{340} In this scenario, the facility has committed a total of 210 violations. The facility thus faces a maximum civil penalty of $2,100,000 (10 violations for 10 days plus 200 violations for 200,000 pounds in excess). If the facility had purchased RTC's for the 100 tons of excess pollutants, it would only have had to pay $1,500,000 ($15,000 per ton multiplied by 100 tons). Dividing $1,500,000 into $2,100,000 yields approximately 70\%.
\end{itemize}
The above hypotheticals imply that: (1) the RECLAIM penalty structure may deter egregious violations by large facilities less effectively, and (2) RECLAIM's monitoring activities may have an important impact on the effectiveness of the enforcement scheme. The deterrent value of the RECLAIM enforcement structure increases as the probability of detection needed for effective deterrence decreases. As shown above, the deterrent value of the RECLAIM penalty depends on the amount of excess pollution emitted and the number of days of violation. The greater the ratio of excess pollution to days of violation, the smaller the deterrent value becomes. Large facilities that commit egregious violations must face a higher probability of detection before they can be adequately deterred.341 The hypotheticals, therefore, also highlight the importance of RECLAIM's monitoring activities to the enforcement scheme. Ineffective monitoring, resulting in a low probability of violations being detected, would substantially diminish the deterrent value of the RECLAIM penalty.

In addition to the Code's strict liability civil penalty provision discussed above, other enforcement provisions also augment the deterrent effect of the penalty. For example, RECLAIM Rule 2004 presumes that an emissions violation has occurred for 365 days unless the facility can demonstrate otherwise by "clear and convincing" evidence.342 As the seriousness of the violation increases, the more likely the District will successfully make use of the more stringent civil and criminal remedies available. The District also has the authority to impose costly MRR requirements upon noncomplying facilities to ensure future compliance.343 If a facility commits a particularly egregious violation, the District may revoke the facility's permit and subject the facility to NSR requirements.344

The range of enforcement options available allows the District to tailor penalties to particular violations. The ability to tailor penalties lends credibility to the enforcement scheme. Yet a system of enforcement will not function effectively unless the regulated community believes that a violation has a realistic chance of being detected.345

341. See CCA, RECOMMENDED CHANGES, supra note 201, at 2-3.
345. Wasserman argues that the regulated community's perception of the enforcement landscape is "as important or even more important than reality... The perception of a strong enforcement effort, of the willingness to pursue sanctions and to escalate enforcement action, can be created by the manner in which governmental enforcement actions are taken, as well as by the actual number and results of actions themselves." Wasserman, supra note 329, at 26.
I. Monitoring, Reporting, and Recordkeeping

In addition to making available the alternative of buying permits, RECLAIM gives participants the freedom to select a control technology to satisfy emission standards. Along with this freedom, however, go the responsibilities and burdens of more extensive and stringent monitoring, reporting, and recordkeeping than under command and control. Command and control regulations typically specify the precise requirements of compliance with air control standards. They leave little room for choice as to how to achieve these standards. RECLAIM rules, on the other hand, leave out one major specification—how the facility must reduce emissions. In exchange for the freedom to select their own emission control methods, RECLAIM facilities must comply with the program’s rigorous MRR requirements.

The MRR requirements for SO\textsubscript{x} and NO\textsubscript{x} are highly complex and are central to the success of RECLAIM. In general, the program’s MRR requirements depend on the size of the emitting source: the larger the source, the more demanding are the MRR requirements. The requirements will be discussed separately for each pollutant.

1. MRR Requirements for SO\textsubscript{x} Sources

SO\textsubscript{x} sources fall into two categories: major sources and process units. Every major source must install a continuous emissions monitoring system (CEMS) to monitor emissions. In addition to the CEMS, a facility must install a device that enables it to report total daily mass emissions electronically to the District. Facility permit

346. See Stewart, Regulation, Innovation, and Administrative Law, supra note 274, at 1264 (stating that command and control proscribes specific conduct by regulated entities).
347. Id.
348. See SCAQMD, RECLAIM REPORT, supra note 3, at EX-14.
349. RECLAIM Rules 2011 (SO\textsubscript{x}) and 2012 (NO\textsubscript{x}) incorporate by reference the lengthy protocols for monitoring, reporting, and recordkeeping for both pollutants. RECLAIM Rule 2011(j) (1993) (MRR protocol for SO\textsubscript{x}); RECLAIM Rule 2012(l) (1993) (MRR protocol for NO\textsubscript{x}).
350. A major source is classified as such if (1) it emits 10 tons or more per year of SO\textsubscript{x}, or (2) it is of a certain type—for example, any tail gas unit or sulfuric acid production unit is deemed a major source. RECLAIM Rule 2011(c) (1993).
351. Process units are those sources that are not major sources, provided that if a process unit is composed of distinct pieces of SO\textsubscript{x}-emitting equipment, the separate pieces have the same emission factor. RECLAIM Rule 2011(d)(1) (1993).
352. A CEMS is a device that continuously measures emissions. RECLAIM Rule 2000(c)(14) (1993). A facility may avoid installing a CEMS if it operates an alternative monitoring system that the Executive Officer determines to be equivalent in terms of accuracy, reliability, reproducibility, and timeliness. RECLAIM Rule 2011(c)(2)(B) (1993).
353. RECLAIM Rule 2011(c)(2)(A) (1993). The CEMS is connected by dedicated lines to the SCAQMD’s monitoring computer. See SCAQMD, RECLAIM REPORT, supra note 3, at IV-10.
holders for major sources must also submit monthly emission reports.\footnote{355}{RECLAIM Rule 2011(c)(3)(B) (1993).}

The facility permit holder of a $\text{SO}_x$ process unit must either meet the requirements for major sources or comply with the more relaxed requirements that apply specifically to process units.\footnote{356}{RECLAIM Rule 2011(d)(2) (1993).} A process unit that chooses the latter may elect to measure either (1) fuel usage, or (2) operating time and production/processing/feed rate.\footnote{357}{RECLAIM Rule 2011(d)(2)(A), tbl. 2011-1, app. A at tbl. 3-A (1993) (describing variables to measure, recording frequency, data, and transmitting frequency).} In addition, a process unit must use an emission factor to determine its mass emissions.\footnote{358}{RECLAIM Rule 2011(d)(2)(C) (1993).} Initially, the District sets emission factors to reflect the implementation of technologies that existing District regulations have required as of December 31, 1994.\footnote{359}{RECLAIM Rule 2011(d)(3) (1993). Calculations of mass emissions from each process unit shall be based upon the emission factor specified in RECLAIM Rule 2002. Id.} If a facility applies for a change in its emission factor and is able to demonstrate that a lower factor is reliable, accurate, and representative in calculating emissions, the Executive Officer will change the factor.\footnote{360}{RECLAIM Rule 2011(d)(4) (1993). Applying the same criteria, the Executive Officer may also amend a facility's emission factor at his own initiative. RECLAIM Rule 2011(d)(5) (1993).} Permit holders of a process unit, like those of major sources, must report emissions to the District on a quarterly basis.\footnote{361}{RECLAIM Rule 2011(d)(2)(B) (1993). The permit holders must do so as part of the Quarterly Certification of Emissions required by RECLAIM Rule 2004. Id.}

2. **MRR Requirements for $\text{NO}_x$ Sources**

The MRR requirements for $\text{NO}_x$ sources\footnote{362}{These requirements are found in RECLAIM Rule 2012.} are structured in a similar fashion to the MRR requirements for $\text{SO}_x$ sources. Sources emitting $\text{NO}_x$ fall into three categories: major sources,\footnote{363}{Generally, sources that emit the most $\text{NO}_x$ are classified as major sources. RECLAIM Rule 2012(c)(1) lists the types of sources that are considered major. The rule also includes a default provision that classifies a source that emitted 10 tons or more of $\text{NO}_x$ per year between 1987 and 1991 as a major source. RECLAIM Rule 2012(c)(1)(J) (1993).} large sources,\footnote{364}{RECLAIM Rule 2012(d)(1) lists the types of sources that are considered large. The rule includes a default provision that classifies a source that emitted 4 tons or more but less than 10 tons of $\text{NO}_x$ per year between 1987 and 1991 as a large source. RECLAIM Rule 2012(d)(1)(G) (1993).} and process units.\footnote{365}{Process units are those sources that emit the least $\text{NO}_x$. RECLAIM Rule 2012(e)(1) lists the types of sources that are considered process units. The rule includes a default provision that classifies a source that is neither a major source nor a large source as a process unit. RECLAIM Rule 2012(e)(1)(E) (1993).}

The MRR requirements for $\text{NO}_x$ differ for each category of sources. Major sources face the most stringent requirements, while
process units face the least. Major NO\textsubscript{x} sources have to meet essentially the same requirements as major SO\textsubscript{x} sources.\textsuperscript{366}

The facility permit holder of a large NO\textsubscript{x} source may choose to comply with either the MRR requirements applicable to major NO\textsubscript{x} sources or the more relaxed requirements that apply specifically to large sources.\textsuperscript{367} According to the latter requirements, a large source must operate a totalizing fuel meter and any other device that the Executive Officer considers necessary for measuring fuel usage.\textsuperscript{368} A large source must also calculate mass emissions using: (1) an emission factor, or (2) an equipment-specific emission rate or concentration limit.\textsuperscript{369} The facility permit holder of a large source may apply to the Executive Officer to amend the concentration limit or equipment-specific emission rate.\textsuperscript{370} Additionally, the large source permit holder must report mass emissions to the District on a monthly basis.\textsuperscript{371}

Similarly, the facility permit holder for a process unit may comply with the MRR requirements applicable to major sources or large sources, or may elect to comply with the more relaxed requirements that apply specifically to process units.\textsuperscript{372} Under these more relaxed requirements, a process unit must install (1) a totalizing fuel meter and/or timer, or (2) any other device that the Executive Officer speci-

\textsuperscript{366} Like RECLAIM Rule 2011 for SO\textsubscript{2}, RECLAIM Rule 2012 requires that the facility permit holder of a major NO\textsubscript{x} source install a CEMS or a functionally equivalent alternative, as well as report emissions electronically on a daily basis. \textit{Compare} RECLAIM Rule 2012(c)(2)(A)-(B) (1993) \textit{with} RECLAIM Rule 2012(c)(3)(A) (1993).

\textsuperscript{367} RECLAIM Rule 2012(d)(2) (1993).

\textsuperscript{368} RECLAIM Rule 2012(d)(2)(A) (1993).

\textsuperscript{369} RECLAIM Rule 2012(d)(2)(C) (1993). Initially, the emission factor used to calculate emissions is the same as that specified in RECLAIM Rule 2002 for calculating the starting allocation. RECLAIM Rule 2012(f)(1) (1993). Starting in 1995, large sources will have to (1) comply with either an equipment-specific NO\textsubscript{x} concentration limit for that source, or (2) establish an equipment-specific emission rate that is reliable, accurate, and representative of that source's emissions. RECLAIM Rule 2012(f)(2)(A)-(B) (1993).

According to the definitions section of the RECLAIM rules, a concentration limit "is measured over any continuous 60 minutes . . . and is specified in the Facility Permit." RECLAIM Rule 2000(c)(13) (1993). The source must not go over the concentration limit. SCAQMD, \textit{RECLAIM REPORT}, \textit{supra} note 3, at IV-11. An "emission rate" is defined as "a value expressed in terms of NO\textsubscript{x} mass emissions per unit of heat input . . . and is used to calculate NO\textsubscript{x} mass emissions on an average basis." RECLAIM Rule 2000(c)(25) (1993).

\textsuperscript{370} RECLAIM Rule 2012(f)(3) (1993). To have its emission rate amended, the facility permit holder must demonstrate that the rate it proposes is reliable, accurate, and representative for the purpose of calculating mass emissions. \textit{Id}. No such demonstration is required to amend a concentration limit. \textit{Id}. The source must simply adhere to that limit once the facility permit is amended. \textit{Id}. The Executive Officer may amend the facility permit to incorporate a new equipment-specific emission rate that is more reliable, accurate, and representative than the previous rate or concentration limit. RECLAIM Rule 2012(f)(4) (1993).


\textsuperscript{372} RECLAIM Rule 2012(e)(2) (1993).
fies as a functional equivalent.\textsuperscript{373} To calculate mass emissions, process units must adopt either (1) an emission factor, or (2) an equipment-specific or category-specific emission rate.\textsuperscript{374} The facility permit holder of a process unit must report mass emissions to the District on a quarterly basis.\textsuperscript{375}

As is the case for large sources, process units applied a starting emission factor to calculate mass emissions at the beginning of the RECLAIM program.\textsuperscript{376} Like the facility permit holder of a large source, the permit holder of a process unit may, at any time, apply to the Executive Officer for a change in emission factor or category-specific emission rate.\textsuperscript{377} The Executive Officer may amend the emission factor or rate at his or her own initiative.\textsuperscript{378}

3. Timing of Compliance

After entering the program, all sources regulated under RECLAIM may have one year to install the required monitoring and reporting systems.\textsuperscript{379} During the interim one-year period, RECLAIM allows less stringent monitoring and reporting systems.\textsuperscript{380} For example, both major sources of NO\textsubscript{x} and SO\textsubscript{x} may operate a totalizing fuel meter without the continuous emissions monitoring system during the interim period.\textsuperscript{381}

4. Compliance Under a Market-Based System Compared to a Command and Control Regime

Monitoring compliance may prove more difficult under a marketable permits system than under a command and control system.\textsuperscript{382} Critics contend that a regulator under a command and control system need only ensure that the polluter has installed the control equipment and is properly operating it.\textsuperscript{383} On the other hand, a regulator who attempts to enforce a marketable permits program must ensure that

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{373} RECLAIM Rule 2012(e)(2)(A) (1993). The latter device must be a functional equivalent of the totalizing fuel meter or timer for the purpose of measuring either (1) fuel usage, or (2) operating time and production/processing/feed rate. \textit{Id.}
\item \textsuperscript{374} RECLAIM Rule 2012(e)(2)(C) (1993).
\item \textsuperscript{375} RECLAIM Rule 2012(e)(2)(B) (1993). The facility permit holder must do so as part of the Quarterly Certification of Emissions required by RECLAIM Rule 2004. \textit{Id.}
\item \textsuperscript{376} RECLAIM Rule 2012(f)(1) (1993).
\item \textsuperscript{377} RECLAIM Rule 2012(f)(3) (1993).
\item \textsuperscript{378} RECLAIM Rule 2012(f)(4) (1993).
\item \textsuperscript{379} RECLAIM Rule 2011(f)(4)-(5) (1993); RECLAIM Rule 2012(h)(4)-(5) (1993).
\item \textsuperscript{380} RECLAIM Rule 2011(f)(3) (1993); RECLAIM Rule 2012(h)(3) (1993). Requiring only a fuel meter in the interim is less stringent than requiring implementation of all monitoring and reporting systems.
\item \textsuperscript{381} See RECLAIM Rule 2011(f)(3) (1993).
\item \textsuperscript{382} SCAQMD, \textit{RECLAIM Socioeconomic and Environmental Assessments, supra} note 1, app. H, at 7-8.
\item \textsuperscript{383} \textit{Jenal, supra} note 84, at 9.
\end{enumerate}
\end{footnotesize}
the facility complies with an emissions cap. To accomplish this, the regulator must be able to determine at any time the facility's emissions and its remaining emission allocation. The regulators, therefore, face a formidable enforcement task.

Moreover, some environmental groups contend that the probability of cheating will be higher under a permits system than under command and control. These groups argue that a marketable permit program creates incentives to cheat that do not exist under a system of command and control. According to the critics, facilities may overestimate their emission reductions so they may make as much money as possible from selling credits. Or they may underestimate their emissions so they may avoid spending money on credits to meet their allocation.

Industry representatives have argued that RECLAIM imposes unnecessarily high MRR costs on firms. According to the District, MRR will cost on average $12.8 million more per year from 1994 to 1995 under RECLAIM than under command and control. The expanded use of the CEMS accounts for over $10 million of this figure. These devices typically cost between $11,000 and $28,000 annually. Of course, technological innovations may make operating monitoring equipment less expensive in the future.

In response to these criticisms regarding costs, the District has made several arguments to justify the high MRR demands and costs of RECLAIM. These arguments are as follows. First, the vast major-

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384. Id.
385. Id.
386. Id.

In years past, compliance was determined by whether the facility had installed the proper equipment or switched to less polluting materials and was using them correctly. Those relatively straightforward determinations are no longer dispositive. Instead, under RECLAIM an inspector must know what the presently allowed level is (based on how many credits the company holds) and she must be able to determine exactly what the actual emissions are right now. Without both of these pieces of information, the inspector cannot determine compliance in the field, and the enforceability of the program is a myth.

Id.

388. Id. at 6.
389. See id.
390. Id.
391. See SoCal GAS, A FAIR AND WORKABLE RECLAIM PROPOSAL, supra note 165, at 1.
392. SCAQMD, RECLAIM SOCIOECONOMIC & ENVTL. ASSESSMENTS, supra note 1, at VI-10.
393. Id.
394. SCAQMD, RECLAIM REPORT, supra note 3, at IV-4.
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395. See id. at V-27. The District projects that major and large sources will account for over 90% of emissions. Id.

396. SCAQMD, RECLAIM SOCIOECONOMIC & ENVTL. ASSESSMENTS, supra note 1, app. H, at 17-20. The District claims that the margin of error is far less than the 10% asserted by Citizens for a Better Environment. Id.

397. Id. app. H, at 6.

398. Id. at VI-10.

399. See Drayton, supra note 112, at 29-31 (arguing that once control equipment is installed, ensuring its proper operation and maintenance is particularly difficult).

400. MELNICK, REGULATION AND THE COURTS, supra note 65, at 197.


405. RECLAIM Rule 2015(c)(3)(B) (1993). The six source categories include glass-melting furnaces, gray cement kilns, steel slab reheating, flat-rolled product annealing and flat-rolled product galvanizing furnaces, metal-melting furnaces, hot mix asphalt operations, and petroleum coke calciners (NOx only). Id. The reevaluation attempts to deter-
Executive Officer may then propose to amend the starting allocations for the facilities on the basis of this evaluation.406


To address the possibility of increases in emissions due to SCAQMD-mandated changes or program failure, RECLAIM contains several “backstop” provisions. First, if any of the circumstances described in the previous subsection triggers an allocation increase, the Executive Officer must recommend to the District Governing Board that such increase be offset in the AQMP.407 Second, RECLAIM requires the District to conduct annual audits, which will assess emissions reductions, public health impacts, the functioning of the RTC market, economic impacts, and other issues.408 Third, the District must in 1997 conduct a comprehensive three-year audit to evaluate the performance of RECLAIM.409 The three-year audit will analyze many of the same factors as the annual audit.410 Fourth, the Executive Officer must notify the District Governing Board of any allocation increases decided by the District Hearing Board.411 The Executive Officer must then recommend adjustments to the AQMP and to RECLAIM allocations to compensate for any ensuing shortfall.412 The RECLAIM rules do not specify that the Executive Officer’s recommendations must be adopted. The rules, however, do emphasize that the current rule structure is not fixed.413 According to the rules, the District Governing Board reserves the right to amend RECLAIM and to terminate RTC’s.414


In addition, RECLAIM provides for program-specific backstops.415 If at any time the Executive Officer discovers a program problem, he may recommend amendments to the RECLAIM program to the Governing Board.416 Moreover, the Executive Officer

mine whether the original emission factors are achievable, “tak[ing] into account the environmental, energy, and economic impacts by each source category.” RECLAIM Rule 2015(c)(3)(A) (1993).


410. Id.


412. Id.


414. Id.


must propose program amendments if he discovers that actual emissions from RECLAIM sources exceeded allocations for any annual period by 5% or more.\textsuperscript{417} The Executive Officer has wide discretion in the recommendations he may make.\textsuperscript{418} If the program changes that the Executive Officer recommended fail to correct the identified problems, he may propose that the Governing Board replace RECLAIM with the source category-specific emission limits or control measures specified in the then-current AQMP.\textsuperscript{419}

Circumstances signaling failure of the RECLAIM program should trigger program-specific backstops. The criteria for identifying program failure, however, contain a fair amount of uncertainty. The Executive Officer, for instance, must recommend amendment of the program to address any "specific program problems."\textsuperscript{420} Yet the RECLAIM rules do not specify how serious these problems must become before the Executive Officer may appropriately call for an amendment. Moreover, the Executive Officer must propose amendments to RECLAIM "upon discovery that actual emissions from RECLAIM sources exceeded [a]llocations for any annual period by five percent or greater."\textsuperscript{421} The rules, nonetheless, do not indicate the appropriate techniques that the Executive Officer should use to determine this excess. Finally, the ultimate authority to decide whether to adopt the Executive Officer's recommendations falls on the District Governing Board.\textsuperscript{422} The Board would likely consider political factors in making its decision. Thus, a considerable degree of uncertainty plagues the final outcome.

4. Amendment of RECLAIM

The Board may amend the program in a variety of ways. The Board may, for example, restrict trading, require preapproval of trades, or implement technology-specific emission reductions.\textsuperscript{423} These measures, however, can also serve to limit the scope of the market by hindering the trading of marketable permits and decreasing the number of permits available. If the Board makes enough of these modifications, the virtues and strengths of the market may disappear along with the problems sought to be avoided. In deciding to amend

\begin{itemize}
  \item\textsuperscript{417} Id.
  \item\textsuperscript{418} The Executive Officer's recommendations may include, but are not restricted to the following: trading restrictions, requirement of preapproval of trades, enhanced monitoring, increased rates of reduction, implementation of technology-specific emission reductions, and increased penalties. Id.
  \item\textsuperscript{419} RECLAIM Rule 2015(d)(2) (1993).
  \item\textsuperscript{420} RECLAIM Rule 2015(d)(1) (1993).
  \item\textsuperscript{421} Id.
  \item\textsuperscript{422} RECLAIM Rule 2015(b)(5) (1993).
  \item\textsuperscript{423} RECLAIM Rule 2015(d)(1) (1993).
\end{itemize}
RECLAIM therefore, the District should weigh the problems associated with permit trading against the negative consequences from attempts to remedy these problems. At some point, if too many restrictions are placed on the functioning of the market, it will be preferable to simply switch back to command and control.

5. Termination of RECLAIM

If RECLAIM develops widespread and irremediable problems, the District Governing Board may completely replace RECLAIM with the "source category-specific emission limits or control measures contained in the then current AQMP." The move away from RECLAIM back to a system of command and control will unlikely be swift. The District has pinned its institutional pride onto RECLAIM, as well as committed a substantial amount of time and resources to the program's development. Having vigorously championed RECLAIM, therefore, the District will likely resist the return to command and control.

If the District does terminate the program, however, the RECLAIM rules do not state how quickly a RECLAIM source must implement the AQMP requirements. It is unclear whether sources will receive a one-year grace period, similar to the period that RECLAIM's severability clause allows for installing control equipment. It is also unclear whether the District will have updated AQMP rules for all of the sources regulated under RECLAIM.

In the event of program failure, moreover, the District may have to find ways to deal with facilities that have significantly invested in RECLAIM's future. A firm, for instance, may have purchased hundreds of thousands of dollars worth of RTC's in order to maintain its current pollution control equipment. The District might deal with this problem by maintaining RECLAIM for facilities that have bought RTC's with a value either exceeding a certain amount or amounting to a certain percentage of the facility's income or net worth. To develop industry confidence in RECLAIM and to encourage participation in the RTC market, the District may well indicate in advance its position on this issue.

CONCLUSION

Because RECLAIM is so innovative, the program may possibly contain a serious design or implementation flaw that will undermine its success. Opponents of RECLAIM have stressed the uncertainty of moving into relatively uncharted territory. Citizens for a Better Envi-

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ronment expressed this viewpoint well when it commented: "[I]t is bad public policy for the agency charged with protecting the public's health to bet our lives on such a risky gamble as RECLAIM."426

On the other hand, the massive air pollution problem in Los Angeles, combined with the growing costs of control, calls for innovation. Ironically, the very desperation of the situation in Los Angeles simultaneously pushes for change as well as pulls against it. The situation pulls against change because if the program fails, the residents of the Basin will lose at least half a decade in the struggle for clean air. At the same time, the Basin's situation pushes for change because abatement costs have been skyrocketing. The pressure from already highly regulated stationary sources shows discontent with these increasing costs. Furthermore, many observers seriously question the economic, technological, and political feasibility of using command and control to achieve NAAQS in the Basin. The District weighed the scales and decided in favor of change.

The RECLAIM program may arguably have room for improvement, particularly in its allocation methodology, its provisions for mobile source credits, its scope, and its monitoring and enforcement. Before approving or disapproving RECLAIM, however, one must ultimately ask whether the program is better than command and control. RECLAIM represents the product of a long technical and political process that resulted in certain approaches to permit trading as opposed to others. While other forms of a marketable permits program are also imaginable, RECLAIM has, nonetheless, satisfied the central criteria for a successful marketable permits program. In the evaluation of RECLAIM, therefore, the proper comparison is between a well-functioning marketable permits program and an ongoing command and control system.

The history of air pollution control demonstrates that a government cannot achieve clean air by simply legislating it. Pollution control must be technologically, economically, and politically feasible in order to work. RECLAIM directly addresses this feasibility goal. By reducing the costs of pollution control, stimulating technological innovation, and allowing businesses to choose the best way to reduce emissions, RECLAIM offers the greatest hope of successfully reducing stationary source emissions in the Los Angeles Air Basin.

426. JENAL, supra note 84, at 16.