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Putting Persuasion Back in the Equation: Compliance in Cap and Trade Programs

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I. INTRODUCTION

High compliance rates are often cited as support for the proposition that emissions trading regulation works.[1] The Acid Rain Program, established by the Clean Air Act Amendments of 1990 to regulate sulfur dioxide emissions, enjoyed 100% compliance for the first several years of its life, and no less than 99% compliance thereafter.[2] The Regional Clean Air Incentives Market ("RECLAIM") program, implemented in Los Angeles to control nitrogen and sulfur oxide emissions, has reported compliance rates of over 85% throughout its lifetime.[3]

Near-100% compliance rates are music to the ears to those familiar with compliance rates in many traditional environmental regulatory programs. In traditional technology-based regulatory programs, regulators sometimes quipped that it was easier to find a facility out of compliance than in compliance. Assessing compliance with traditional regulation was plagued by a variety of barriers including the lack of access to facilities, inadequate data, and the complexity of compliance determinations. In contrast, cap and trade holds out the possibility—even the promise—of full compliance and enforcement.

But compliance has a very different meaning in the context of cap and trade programs than in traditional environmental regulation. In traditional regulation, compliance was a discretion-laden judgment by regulators about the company's environmental performance or its good faith efforts to improve its environmental performance.[4] Compliance determinations were often subjective rather than objective determinations. They were based not on quantitative data, but on a series of social interactions in which

1. *See, e.g.*, Dallas Burtraw & Byron Swift, *A New Standard of Performance: An Analysis of the Clean Air Act's Acid Rain Program*, 26 ENVTL. L. REP. (Envtl. Law Inst.) 10,411, 10,411 (1996); Byron Swift, *How Environmental Laws Work: An Analysis of the Utility Sector's Response to Regulation of Nitrogen Oxides and Sulfur Dioxide Under the Clean Air Act*, 14 TUL. ENVTL. L.J. 309, 323-25 (2001) [hereinafter Swift, *How Environmental Laws Work*].

2. *See* Burtraw & Swift, *supra* note 1, at 10,411; Swift, *How Environmental Laws Work*, *supra* note 1, at 316, 321-22; *see also* U.S. EPA, Clean Air Markets, Progress Reports, http://www.epa.gov/airmarkets/progress/progress-reports.html (last visited Mar. 28, 2007).

3. U.S. EPA REGION 9, AN EVALUATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S REGIONAL CLEAN AIR INCENTIVES MARKET—LESSONS IN ENVIRONMENTAL MARKETS AND INNOVATION i, 1, 12 (2002), *available at* http://www.epa.gov/region09/air/reclaim/report.pdf [hereinafter AN EVALUATION OF SCAQMD'S RECLAIM].

4. *See infra* Part II.A-B.

regulators and regulated bargained about what would constitute compliance.[5] A compliant status signaled to the public that a company was meeting the agency's expectations. With information provided by agency determinations that companies were out of compliance, public interest groups had mechanisms to pressure regulators or the company directly to change its behavior.[6]

In cap and trade regulation, compliance is an objective determination that does not rely on information about the environmental behavior of a company.[7] A company is in compliance if the number of allowances it holds is equal or greater than the amount of pollutant it has emitted.[8] In cap and trade, compliance is an objectively-determined status that no longer communicates information about the efforts that facilities are making to reduce emissions.[9] At the facility level, compliance is disassociated from environmental outcomes and constitutes a mere artifact of program participation.

This article first explains the different meaning and significance of compliance and enforcement in the context of cap and trade regulation. The article then argues that this redefinition of compliance implies both a gain and a loss in terms of environmental policy outcomes. On one hand, cap and trade programs involve less conflict between regulator and regulated.[10] Interactions between them no longer involve extensive bargaining—with the conflict that such bargaining can often entail—about how companies should reduce their emissions. Rather, the regulator is merely the "accountant"—keeping track of a facility's emissions and allowance holdings and seeing if they match at some predetermined time. On the other hand, cap and trade programs entail the curtailment of a social relationship—the enforcement relationship—that has resulted in large environmental gains in the past.[11] Under cap and trade, regulator and regulated no longer engage in negotiations and information exchange about pollution control technologies and other means to reduce emissions.

Finally, the article proposes the use of compliance plans within cap and trade programs to restore valuable aspects of the

5. *See infra* Part II.B.
6. *See infra* Part II.C.
7. *See infra* Part III.
8. *See infra* Part III.A.
9. *See infra* Part III.B-C.
10. *See infra* Part III.
11. *See infra* Part II.

social relationships that centered on pollution reduction. While some cap and trade programs may be adequately designed such that the market incentives provided by the program promote the desired emissions reductions, others may not. A case in point is provided by the RECLAIM program, which sought to reduce air pollution from large stationary sources in the Los Angeles area. By many indications, the market created by the regulation failed to send the signals necessary to spur investments in pollution control technologies that were required to meet the cap. Reforms to the program instituted a requirement for compliance plans, which then achieved significant emissions reductions. This article recommends the incorporation of compliance plans within cap and trade programs, particularly for those programs that are expected to require the use of pollution control technologies to achieve the emissions cap.

This article extends the socio-legal literature on compliance and enforcement into the context of market-based environmental regulation. Compliance and enforcement have different dynamics in emissions trading regulation than they do in traditional standards-based regulation. These dynamics have remained unexplored by socio-legal scholars.[12]

II. COMPLIANCE WITH TRADITIONAL AIR POLLUTION REGULATION

The high compliance rates achieved by cap and trade programs are particularly notable when contrasted with low or unquantifiable compliance rates that characterize many traditional air pollution regulatory programs. Compliance with traditional Clean Air Act regulations was often a process, rather than an up-down determination.[13] In broad terms, a compliance determination was the outcome of a negotiation—sometimes cooperative, sometimes conflictive—between government and agencies about

12. Several economists, however, have examined compliance and enforcement in emissions trading programs. *See, e.g.,* John K. Stranlund, Carlos A. Chávez & Barry C. Field, *Enforcing Emissions Trading Programs: Theory, Practice, and Performance*, 30 POL'Y STUD. J., 343 (2002) [hereinafter Stanlund et al., *Enforcing Emissions Trading Programs*]; Carlos A. Chávez & John K. Stranlund, *Enforcing Transferable Permit Systems in the Presence of Market Power*, 25 ENVTL. & RES. ECON . 65, 65-78 (2003); Mark A. Cohen, *Monitoring and Enforcement of Environmental Policy*, *in* THE INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS 1999/2000: A SURVEY OF CURRENT ISSUES 44 (Henk Folmer & Tom Tietenberg eds., 1999).

13. *See infra* Part II.B.

facility-specific environmental performance.[14] The first part of this section explains the core component of traditional regulation, technology-based standards in the context of the Clean Air Act. The second part discusses the extent of subjectivity involved in compliance determinations under traditional programs of the Clean Air Act. The final part examines the enforcement relationships that developed therein between regulators and regulated entities.

A. Technology-Based Regulation

In essence, the Clean Air Act ("the Act") consists of health-based air quality goals that have been implemented through technology-based emissions requirements.[15] The Act requires that the [United States] Environmental Protection Agency ("EPA") establish national ambient air quality standards ("NAAQS") for criteria pollutants, defined in the Act as those pollutants that endanger public health or welfare and come from numerous and diverse sources.[16] Criteria pollutants include sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen dioxide, and lead.[17] NAAQS must be set at levels that are "requisite to protect the public health" with an adequate margin of safety.[18]

In implementing the Clean Air Act, regulatory agencies have relied primarily on setting and enforcing industry- and facility-specific emission-rate standards to meet air quality goals. Based on studies of emission reduction technologies, environmental agencies determined the maximum emission rates that would be allowed for a given types of point source.[19] While this approach theoretically gave facilities flexibility in choosing how to comply with the allowable emission rate, in practice, facilities often felt compelled to comply by using the technology upon which the standard had been based.[20]

The technology-based emissions requirements that implement the NAAQS come in several forms. New and modified sources are subject to federal technology-based standards through the New Source Performance Standard ("NSPS") program and the

14. *Id.*
15. Clean Air Act, 42 U.S.C. §§ 7401-7671q (2000).
16. *Id.* §§ 7408(a)(1), 7409.
17. EPA, Six Common Air Pollutants, http://www.epa.gov/air/urbanair/ (last visited Apr. 20, 2007).
18. 42 U.S.C. § 7409(b)(1).
19. *See* Burtraw & Swift, *supra* note 1, at 10,413-14.
20. *See id.*

New Source Review ("NSR") program.[21] Under the 1970 Act's New Source Performance Standards program, the EPA was charged with developing air pollution emission standards for various source categories[22] which reflected "the degree of emission limitation achievable through the application of the best system of emission reduction which . . . the Administrator determines has been adequately demonstrated."[23] To develop the NSPS, the EPA typically conducted a study of the pollution control technologies available for reducing emissions from a source category.[24] Considering cost and feasibility, the EPA would then select the "best demonstrated technology."[25] The emissions rate standard would then be set at the emissions rate that was achievable using this technology.[26]

Under the 1977 Amendments' New Source Review program, the EPA established several other types of technology based performance standards that would apply depending on whether a facility was in a region that demonstrated attainment with the NAAQS or not.[27] In attainment areas, all new and modified sources were required to use the Best Available Control Technology ("BACT"),[28] defined as "an emission limitation based on the maximum degree of [pollutant] reduction . . . which the [state] permitting authority, on a case-by-case basis, . . . determines is achievable for . . . [the] facility."[29] While both BACT and NSPS are technology-based performance standards, NSPS levels are negotiated as industry-wide standards while BACT is determined on a case-by-case basis.[30] BACT determinations take into account the location and other characteristics specific to the facility in question.

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21. EPA, CAA National Enforcement Programs, http://www.epa.gov/compliance/civil/caa/caaenfprog.html#NSR (last visited Apr. 20, 2007).

22. 42 U.S.C. § 7411(b). Examples of source categories subject to NSPS include medical waste incinerators, sulfuric acid plants, glass manufacturing plants, and the beverage can surface coating industry.

23. *Id.* § 7411(a)(1).

24. *Id.*

25. *Id.*

26. *Id.*

27. *See* EPA, New Source Review, http://www.epa.gov/nsr/ (last visited Apr. 20, 2007).

28. 42 U.S.C. § 7475(a)(4).

29. *Id.* § 7479(3).

30. *See* Jason Scott Johnston, *Tradable Pollution Permits and the Regulatory Game*, *in* MOVING TO MARKETS IN ENVIRONMENTAL REGULATION: LESSONS FROM TWENTY YEARS OF EXPERIENCE 359-60 (Jody Freeman & Charles D. Kolstad eds., 2007) [hereinafter Johnston, *Tradable Pollution Permits and the Regulatory Game*].

In non-attainment areas, the New Source Review program requires Lowest Achievable Emission Rate ("LAER"),[31] defined in law as the more stringent of (1) the lowest emission limit for that class of sources in any State Implementation Plan ("SIP"), unless the source can demonstrate that such a limit is not achievable, or (2) the most stringent limit that in practice is achieved by the sources of the same types as the proposed source.[32] Existing sources in non-attainment areas are required to use Reasonably Available Control Technology ("RACT"), defined as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.[33] LAER and RACT are similar to BACT in that they are determined on a case-by-case basis in the permitting process for a specific facility.[34] In practice, however, the technology choices that are considered by the EPA to satisfy the LAER and RACT standard have been very limited.[35]

Aside from federal requirements on all sources located in non-attainment areas and on new and modified sources in attainment areas, all sources were subject to "emission limitations" imposed by states. Under the Act, states are required to write SIPs to assure that each "air quality control region" of the state achieves the NAAQS.[36] The SIP must include enforceable emission limitations,[37] which may take a variety of forms including restrictions on the rate or amount of pollutants that may be emitted, requirements for use of a specific technology, or prohibitions on the use of a certain material or ingredient.[38]

All these standards are similar in that they involve agency officials in discussions with companies about which emissions con-

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31. 42 U.S.C. § 7503(a)(2).

32. *Id.* § 7501(3).

33. *Id.* § 7502(c)(1); *see* 40 C.F.R. § 51.100(o) (2006).

34. The 1990 amendments required the EPA to establish a RACT/BACT/LAER clearinghouse which contains information about past determinations. 42 U.S.C. § 7503(d).

35. *See* Johnston, *Tradable Pollution Permits and the Regulatory Game*, *supra* note 30, at 360.

36. 42 U.S.C. § 7410(a)(1).

37. *Id.* § 7410(a)(2).

38. *See* JEFFREY M. GABA, ENVIRONMENTAL LAW 115 (2005). States had broad discretion in setting such emissions limitations. In *Train v. NRDC*, 421 U.S. 60, 79 (1975), the United States Supreme Court held that "[t]he Act gives the Agency no authority to question the wisdom of a State's choices of emission limitations if they are part of a plan which satisfies the standards of [42 U.S.C. § 7410(a)(2)]."

trol technology to select. In a general sense, the standards all instructed regulators to base pollution standards on what was technologically and economically achievable by an industry or a particular firm.[39] Given the nature of these standards, their development and implementation is a highly subjective and discretionary regulatory activity.

Indeed, there are a series of opportunities for industries and individual companies to bargain with agencies about the standards themselves and how they should be applied. When the standards are being developed, the EPA seeks information from the industry about which technologies should be considered in setting the various performance standards.[40] As explained by Johnston, "[t]he process of promulgating technology-based standards is a long, costly battle between industry and the EPA over issues regarding the cost and effectiveness of a particular technology, [and] how these vary with facility type . . . ."[41] Once promulgated, they are implemented by state regulators who have the authority to make them binding on particular firms.[42] At this point, firms may argue with state regulators about the applicability of a standard to their facility.[43] Finally, if a firm is dissatisfied with the standards as applied by the state agency, it may attempt to seek a variance from the state or federal agency.[44]

B. The Compliance Process

Compliance with traditional environmental regulation based on technology standards under the Clean Air Act is best understood as a process rather than a clear binary determination. Discretion is pervasive in agency decisions about whether a company is in compliance and what the sanction should be for noncompli-

39. Johnston, *Tradable Pollution Permits and the Regulatory Game*, *supra* note 30, at 353. *See also* David M. Driesen, *Distributing the Costs of Environmental, Health, and Safety Protection: The Feasibility Principle, Cost-Benefit Analysis, and Regulatory Reform*, 32 B.C. ENVTL. AFF. L. REV. 1 (2005).

40. Johnston, *Tradable Pollution Permits and the Regulatory Game*, *supra* note 30, at 360-61.

41. *Id.* at 360.

42. *Id.* at 361.

43. *See id.* at 361. Johnston notes that while the courts have held that uniform technology-based standards are designed to be applied uniformly across firms in the relevant source category, the EPA and state regulators often take the economic circumstances of particular firms into account when permits are written. *Id.*

44. *Id.* at 362-63. The statute and judicial decisions significantly limit the ability of the EPA to grant variances. *Id.* at 362.

ance.[45] As explained by one commentator, compliance is a "complex process of defining responses to mandates that are often ambiguous."[46] Compliance plans, in which companies committed to taking a series of steps over a period of time to attain compliance, were a central component of the compliance process.[47]

The "deceptively simple" question of what it means to comply with environmental law has spawned a large literature.[48] This literature has emphasized the subjective and continuous nature of compliance determinations.[49] In many contexts addressed by traditional air and water pollution regulation, companies had engaged for many years in practices that were subsequently defined as polluting.[50] Compliance often takes the form of a process in which the regulator prescribes remedial measures and monitors the responses of the polluter.[51] Compliance involves a "continuing relationship between officer and polluter" and constitutes "a continuing effort toward attainment of a goal as much as attaining the goal itself."[52] Compliance, in this view, is a "fluid, negotiable matter" rather than an "objectively-defined unproblematic state."[53] Its determination is the outcome of negotiation in the context of an enforcement relationship rather than the application of a bright-line rule by the regulator.[54]

A lack of information about compliance rates has prevailed for many traditional environmental regulations. To the extent that compliance rates have been quantified, many have indicated significant rates of noncompliance.[55] In 1999, for example, the EPA's Office of Enforcement and Compliance disclosed that major dis-

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45. BRIDGET M. HUTTER, COMPLIANCE: REGULATION AND ENVIRONMENT 12 (1997) [hereinafter HUTTER, COMPLIANCE].

46. *Id.* at 13.

47. *See* Lucia Ann Silecchia, *Ounces of Prevention and Pounds of Cure: Developing Sound Policies for Environmental Compliance Programs*, 7 FORDHAM ENVTL. LAW J. 583 (1996).

48. Joseph F. DiMento, *Can Social Science Explain Organizational Noncompliance with Environmental Law?*, *in* A READER IN ENVIRONMENTAL LAW 218, 219 (Bridget M. Hutter ed., 1999) [hereinafter DiMento, *Can Social Science Explain Organizational Noncompliance with Environmental Law?*].

49. *See generally id.* at 219-20 (discussing the differences between specific and general compliance and other variables affecting compliance).

50. *See* Keith Hawkins, *Compliance Strategy*, *in* A READER IN ENVIRONMENTAL LAW, *supra* note 48, at 161, 162.

51. *See id.*

52. *Id.* at 165.

53. *Id.* at 183.

54. *See id.* at 183-84.

55. JOSEPH F. DIMENTO, ENVIRONMENTAL LAW AND AMERICAN BUSINESS: DILEMMAS OF COMPLIANCE 20 (1986) [hereinafter DIMENTO, DILEMMAS OF COMPLIANCE] (cit-

charging facilities were in violation of the Clean Water Act as much as 58% of the time.[56] Also in 1999, a study found that more than 39% of major facilities in five industrial sectors were out of compliance with the Clean Air Act.[57]

The early years of the Clean Air Act revealed the complexity of gaining and maintaining compliance. Early SIPs were often filled with sweeping, ambiguous regulations such as bans on "visible" emissions and requirements to reduce emissions by a certain percentage that turned out to be infeasible.[58] Challenges and revisions ensued, and SIPs often became unwieldy documents in which "it became impossible just to locate the applicable regulation—to say nothing of understanding or enforcing it."[59] For many years, noncompliance with SIP regulations was widespread and carried little stigma.[60]

Although the Clean Air Act's approach had been to require the attainment of ambient air quality standards, the EPA turned toward a more technology-based approach.[61] It adopted the goal of negotiating agreements with all major sources that committed them to installing reasonably-available pollution control technologies within a specified time period.[62] Compliance negotiations involved discussions about which technologies could be employed to satisfy the applicable standards in particular firms.[63] Regulators would often essentially supervise the firm's choice of technology.[64]

Compliance determinations then generally involved verifying that a specified technology was installed and periodically testing

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ing studies in the 1980s showing high noncompliance with the Clean Water Act, the Toxic Substances Control Act, and the Clean Air Act).

56. Joel A. Mintz, *The Uncertain Future Path of Environmental Enforcement and Compliance: A Book Review Essay Regarding Clifford Rechtschaffen and David L. Markell,* Reinventing Environmental Enforcement and the State-Federal Relationship, 33 ENVTL. L. 1093, 1094 (2003).

57. *Id.*

58. R. SHEP MELNICK, REGULATION AND THE COURTS: THE CASE OF THE CLEAN AIR ACT 162-65 (1983).

59. *Id.* at 48.

60. *Id.* at 169.

61. *Id.* at 169-70.

62. *Id.* at 170.

63. *See* Joseph Kruger, *Companies and Regulators in Emissions Trading Programs* 1 (Res. for the Future, Discussion Paper No. 05-03, 2005), *available at* http://www.rff.org/Documents/RFF-DP-05-03.pdf [hereinafter Kruger, *Companies and Regulators*] (stating that "traditional regulatory programs [] mandate specific technologies or facility-specific standards").

64. Swift, *How Environmental Laws Work*, *supra* note 1, at 322.

the emission rate.[65] Often, once a source installed technological controls, which was relatively easy to verify, the EPA would consider the source to be in compliance unless there was evidence to the contrary.[66] While the federal EPA retains enforcement authority, state environmental agencies constitute the front line of enforcement.[67] Because of limited enforcement resources, compliance would often not be assessed until after a violation was suspected.[68]

Compliance under the Clean Air Act was more difficult to assess than under other traditional technology-based regulation such as the Clean Water Act, in part because permits were not required for individual sources; rather, the requirements on particular facilities were written into the SIP. As part of the Clean Air Act Amendments of 1990, Congress instituted a new program under which each major facility must get an operating permit.[69] In its preface to its regulations implementing the new program, the EPA acknowledged the problems it had experienced in enforcing the Act:

> The program will generally clarify, in a single document, which requirements apply to a source and, thus, should enhance compliance with the requirements of the Act. Currently, a source's obligations under the Act (ranging from emissions limits to monitoring, recordkeeping, and reporting requirements) are, in many cases, scattered among numerous provisions of the SIP or Federal regulations. In addition, regulations are often written to cover broad source categories, therefore, it may be unclear which, and how, general regulations apply to a source. As a result, EPA often has no easy way to establish whether a source is in compliance with regulations under the Act.[70]

The bargained-for nature of compliance determinations is apparent in the role that lawyers often play in the enforcement rela-

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65. Stephanie Benkovic & Joseph Kruger, *To Trade or not to Trade?: Criteria for Applying Cap and Trade*, 1 THE SCI. WORLD J. 953, 955 (2001) [hereinafter Benkovic & Kruger, *To Trade or not to Trade?*].

66. *See id.*

67. *Cf.* Clifford Rechtschaffen, *Deterrence vs. Cooperation and the Evolving Theory of Environmental Enforcement*, 71 S. CAL. L. REV. 1181, 1181 (1998).

68. *Id.* at 1214-16.

69. 42 U.S.C. § 7661a(a) (2000). For a discussion on the Clean Air Act Amendments of 1990's changes to the Act's enforcement regime, see Michael S. Alushin, *Enforcement of the Clean Air Act Amendments of 1990*, 21 ENVTL. L. 2217 (1991).

70. Operating Permit Program, 57 Fed. Reg. 32,250, 32,251 (July 21, 1992) (to be codified at 40 C.F.R. pt. 70).

tionships between regulator and regulated. Given that "conformity with the law is not self-evident,"[71] the meaning of compliance itself is shaped by lawyers who argue on behalf of their clients. Language in legislation and regulations has ambiguous and multiple meanings, and interested parties strive to demonstrate that their actions are consistent with that language.[72] Accordingly, distinctions are made among types of compliance. Regulators distinguish "full compliance" from "substantial compliance."[73] A company is considered to be in substantial compliance when it attains most of the standards most of the time. Full compliance is recognized as an unattainable goal.[74] Another distinction exists between general and specific compliance. General compliance refers to the responsiveness of the regulated sector as a whole; specific compliance refers to the responsiveness of a particular regulated company.[75] Agencies may also develop concepts of "tolerable non-compliance," under which regulators in the agency identify behavior as noncompliant, but determine that formally identifying it as a violation is not appropriate or necessary.[76]

Often, compliance determinations hinge on "good-faith" efforts by companies.[77] In effect, a firm might be out of compliance with a specific regulatory requirement, but be considered to be in compliance generally.[78] A regulator may take a company's recognition of the legitimacy of his demands and the company's willingness to conform in the future as constituting compliance.[79] And even where there was a specific action taken by a company to come into compliance such as the installation of a particular technology, judgment still pervaded the question of how well the technology is maintained and working.[80] Finally, if firms were identified by regulatory agencies as being out of compliance, they

71. HUTTER, COMPLIANCE, *supra* note 45, at 12.

72. DiMento, *Can Social Science Explain Organizational Noncompliance with Environmental Law?*, *supra* note 48, at 220.

73. *See id.*

74. HUTTER, COMPLIANCE, *supra* note 45, at 244 (stating "full enforcement is arguably an impossible and even utopian goal, not least because of insufficient resources").

75. DIMENTO, DILEMMAS OF COMPLIANCE, *supra* note 55, at 25.

76. *See id.* at 27. *See also* Neil Gunningham, *Negotiated Non-Compliance: A Case Study of Regulatory Failure*, 9 L. & POL'Y 69, 69-91 (1987).

77. *See* DIMENTO, DILEMMAS OF COMPLIANCE, *supra* note 55, at 27.

78. Hawkins, *supra* note 50, at 183.

79. *Id.*

80. *See id.*

often had additional opportunities to negotiate with agencies.[81] In sum, determining what standards would have to be complied with, how standards would apply to a particular firm, and whether a particular firm was in compliance all involved bargaining and negotiation.

C. Enforcement Relationships

Just as compliance with traditional environmental law was best understood as a process, so too was enforcement. Regulatory enforcement encompasses not just formal legal action by regulators against regulated actors but the larger social process through which regulators influence the behavior of regulated entities.[82] Indeed, a large literature emerged about "enforcement styles" that describes how regulatory officials assess compliance with the law and respond to situations of noncompliance.[83] Two styles of enforcement, the legalistic style and the conciliatory style, have been described and used to understand and analyze variation in enforcement approaches.[84]

The legalistic style is based on coercion.[85] It is concerned primarily with "the application of punishment for breaking a rule and doing harm . . . . The primary questions are whether a law has been broken, and whether an offender can be detected."[86] Legalistic enforcement involves the strict and literal enforcement of legal rules, heavy reliance on legal penalties, close oversight of inspectors to prevent laxity, and an emphasis on citizen complaints.[87]

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81. *See* Johnston, *Tradable Pollution Permits and the Regulatory Game*, *supra* note 30, at 363 n.63 (noting that the Supreme Court case *Union Electric Co. v. EPA*, 427 U.S. 246, 268 (1976) held that it was appropriate for regulators to consider technological and economic infeasibility in compliance orders for noncomplying firms).

82. Bridget M. Hutter, *Socio-Legal Perspectives on Environmental Law: An Overview*, *in* A READER IN ENVIRONMENTAL LAW, *supra* note 48, at 15, 15.

83. *See* Robert A. Kagan, *Regulatory Enforcement*, *in* HANDBOOK OF REGULATIONS AND ADMINISTRATIVE LAW 387-90 (David H. Rosenbloom & Richard D. Schwartz eds., 1994).

84. *See id.* at 387-88.

85. *See id.* at 387.

86. KEITH HAWKINS, ENVIRONMENT AND ENFORCEMENT: REGULATION AND THE SOCIAL DEFINITION OF POLLUTION 4 (1984) [hereinafter HAWKINS, ENVIRONMENT AND ENFORCEMENT]; *see also* Keith Hawkins & John M. Thomas, *The Enforcement Process in Regulatory Bureaucracies*, *in* ENFORCING REGULATION 3, 8-10 (Keith Hawkins & John M. Thomas eds., 1984); Kagan, *supra* note 83, at 387. Note that the legalistic style is sometimes called the sanctioning style. *See id.*; HAWKINS, ENVIRONMENT AND ENFORCEMENT, *supra*, at 3-4.

87. *See* Kagan, *supra* note 83, at 387; *see also* EUGENE BARDACH & ROBERT A. KAGAN, GOING BY THE BOOK: THE PROBLEM OF REGULATORY UNREASONABLENESS 93-119 (1982) [hereinafter BARDACH & KAGAN, GOING BY THE BOOK].

The conciliatory style, in contrast, is predominantly informal, using techniques of education, advice, persuasion and negotiation.[88] Based on conciliation and compromise, it "seeks to prevent a harm rather than punish an evil . . . . [T]he style is conciliatory and relies upon bargaining to attain conformity."[89] Tough sanctions may be available but are seldom employed.[90] Prosecution is "in the background, as a veiled threat to concentrate the rule-breaker's mind on the necessity of compliance."[91] Finally, in a mixed or "flexible" strategy, regulators tailor their enforcement response to the situation, using both conciliation and sanctions as deemed necessary to attain compliance.[92] They may initially seek to gain compliance by persuasion, and if they fail, they employ increasingly serious and punitive measures.[93]

Effectiveness and efficiency are the two criteria most commonly employed to understand the outcomes or consequences of environmental enforcement styles.[94] The effectiveness of an environmental regulatory style is the extent to which it brings about the desired environmental improvement.[95] Efficiency can be defined as the extent to which the regulatory style minimizes the social and economic costs to attain the desired environmental improvement.[96] Studies that address the effectiveness and efficiency of alternative regulatory styles have found that a legalistic approach tends to be less efficient than a conciliatory approach without being more effective.[97] As explained by one commentator,

88. *See* Kagan, *supra* note 83, at 387; HAWKINS, ENVIRONMENT AND ENFORCEMENT, *supra* note 86, at 4-5; *see also* BRIDGET M. HUTTER, THE REASONABLE ARM OF THE LAW?: THE LAW ENFORCEMENT PROCEDURES OF ENVIRONMENTAL HEALTH OFFICERS 5-7 (1988).

89. HAWKINS, ENVIRONMENT AND ENFORCEMENT, *supra* note 86, at 4.

90. *See* Kagan, *supra* note 83, at 387.

91. KEITH HAWKINS, LAW AS LAST RESORT: PROSECUTION DECISION-MAKING IN A REGULATORY AGENCY 42 (2002).

92. Kagan, *supra* note 83, at 387; *see also* BARDACH & KAGAN, GOING BY THE BOOK, *supra* note 87, at 124; IAN AYRES & JOHN BRAITHWAITE, RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATION DEBATE 20-21 (1992).

93. AYRES & BRAITHWAITE, *supra* note 92, at 20-21. *See also* the discussion of flexible enforcement in BARDACH & KAGAN, GOING BY THE BOOK, *supra* note 87, at 123-51.

94. *See* NEIL GUNNINGHAM & PETER GRABOSKY, SMART REGULATION: DESIGNING ENVIRONMENTAL POLICY 27 (1988).

95. *See* Kagan, *supra* note 83, at 388; *see also* GUNNINGHAM & GRABOSKY, *supra* note 94, at 27.

96. *See* Kagan, *supra* note 83, at 388-89; GUNNINGHAM & GRABOSKY, *supra* note 94, at 27.

97. *See* R. Shep Melnick, *Separation of Powers and the Strategy of Rights: The Expansion of Special Education*, *in* THE NEW POLITICS OF PUBLIC POLICY 23-46 (Marc

"Business will fight sanctions considered unfair by litigating, by using political influence to limit regulatory agency powers, and by challenging the rationality of rules through propaganda campaigns."[98] A legalistic style may thus increase the time, cost and adversarial character of the regulatory process without leading to higher levels of compliance or more environmental improvement.[99] There is a general consensus in the literature that a mix of regulatory styles or a "sophisticated balance" of persuasion and punishment leads to the most favorable outcomes in terms of both effectiveness and efficiency.[100]

While the enforcement styles of regulatory agencies and even particular regulatory officials varied, enforcement of traditional regulation inevitably involved a series of complex social interactions between regulators and regulated firms. Given the reliance of traditional regulation on technology-based standards, these interactions often involved information exchange and negotiation about pollution control technologies and other ways of reducing facility emissions. Whether imbued with a cooperative or a legalistic hue, such discussions and negotiations played an important role in providing information to regulated facilities about pollution control technologies and in influencing facility decisions to undertake emissions reductions.

Moreover, the compliance determinations that emerged from these interactions provided information to the public about the environmental performance of the facility. As explained in a study of the environmental performance of pulp mills, "social stakeholders" could exert pressure on facilities to improve their performance in three ways: they could act as an auxiliary enforcer of regulatory requirements;[101] they could help bring about a tighten-

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K. Landy & Martin A. Levin eds., 1995); GUNNINGHAM & GRABOSKY, *supra* note 94, at 27; *See* Kagan, *supra* note 83, at 390.

98. DiMento, *Can Social Science Explain Organizational Noncompliance with Environmental Law?*, *supra* note 48, at 224.

99. *See* JOSEPH L. BADARACCO, JR., LOADING THE DICE: A FIVE-COUNTRY STUDY OF VINYL CHLORIDE REGULATION (1985); JOHN BRAITHWAITE, TO PUNISH OR PERSUADE: ENFORCEMENT OF COAL MINE SAFETY (1985) [hereinafter BRAITHWAITE, TO PUNISH OR PERSUADE]; Robert A. Kagan, *How Much Do National Styles of Law Matter*, *in* REGULATORY ENCOUNTERS: MULTINATIONAL CORPORATIONS AND AMERICAN ADVERSARIAL LEGALISM 1, 23, 25 (Robert A. Kagan & Lee Axelrad eds., 2000).

100. John T. Scholz, *Cooperation, Deterrence and the Ecology of Regulatory Enforcement*, 18 LAW & SOC'Y REV. 179, 179-222 (1984); *see also* AYRES & BRAITHWAITE, *supra* note 92, at 19-21; BRAITHWAITE, TO PUNISH OR PERSUADE, *supra* note 99, at 182.

101. Any citizen could bring suit against either (a) polluters for failing to comply with valid emission limitations or (b) the Administrator of the EPA for failing to perform a nondiscretionary act or duty. 42 U.S.C. § 7604(a) (2000).

ing of regulatory requirements by complaining to regulators; and they could push a facility to go beyond-compliance in order to prove "good citizenship."[102] In these ways, the public participates extensively in the compliance and enforcement processes of traditional regulation. The study found that these "social license" pressures mattered significantly for most firms that they studied.[103]

III. COMPLIANCE IN EMISSIONS TRADING REGULATION

In the Acid Rain Program, compliance rates were 100% for the first five years of the program from 1995 through 1999, and 99% thereafter.[104] In the RECLAIM program, compliance rates have averaged about 93% since the program began in 1994.[105] In cap and trade, however, compliance rates are delinked from environmental performance at specific facilities. Facilities may comply by buying allowances rather than reducing emissions.[106] Agencies focus on tracking emissions and allowance holdings rather than on what companies are doing to control emissions.[107] Compliance is an up-down determination, not a negotiation.

A. Cap and Trade Design

The Acid Rain and RECLAIM Programs, the two most prominent cap and trade programs in the United States, share a similar design. In both, a "cap" is set on the total mass emissions of a pollutant from a set of sources over a fixed compliance period.[108]

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102. NEIL GUNNINGHAM, ROBERT A. KAGAN & DOROTHY THORNTON, SHADES OF GREEN: BUSINESS, REGULATION, AND ENVIRONMENT 51 (2003).

103. *Id.* at 60.

104. *See* Swift, *How Environmental Laws Work*, *supra* note 1, at 321-22; *See also* EPA, Clean Air Markets, Progress Reports, http://www.epa.gov/airmarkets/ progress/ progress-reports.html (last visited Mar. 28, 2007). For a complete description of the Acid Rain Program, *see* Swift, *How Environmental Laws Work supra* note 1, at 319-22. Information about the program is also available on the EPA's website at http://www.epa.gov/airmarkets/progsregs/arp/basic.html (last visited Apr. 24, 2007).

105. This estimate is based on compliance data reported by the South Coast Air Quality Management District ("SCAQMD"), in Annual RECLAIM Audit Reports, from 1994 through 2004. These reports are available at http://www.aqmd.gov/reclaim/reclaim_annurpt.htm (last visited Apr. 24, 2007).

106. *See* Burtraw & Swift, *supra* note 1, at 10,413-14.

107. *See* Swift, *How Environmental Laws Work*, *supra* note 1, at 322; *see also* Joseph A. Kruger, Brian J. McLean & Rayenne Chen, *A Tale of Two Revolutions: Administration of the SO_2 Trading Program*, *in* EMISSIONS TRADING: ENVIRONMENTAL POLICY'S NEW APPROACH 115-17 (Richard F. Kosobud ed. 2000).

108. OFFICE OF AIR & RADIATION, EPA, TOOLS OF THE TRADE: A GUIDE TO DESIGNING AND OPERATING A CAP AND TRADE PROGRAM FOR POLLUTION CONTROL 1-2 (2003),

The cap is then divided into allowances, where each allowance represents authorization to emit a specific quantity of a pollutant.[109] The allowances are allocated among the sources depending primarily on historical emissions.[110] Over the compliance period, each source measures and reports its emissions.[111]

To the extent that the number of allowances received by a source is not sufficient to cover its emissions, sources have three basic options for compliance: (1) to reduce the source's emissions to meet the allowances held; (2) to reduce the source's emissions below the allowances held and then sell the remainder; or (3) to purchase allowances in the market to make up the difference.[112] Each source can choose its compliance strategy, and change it at any time, without governmental review or approval.[113] After the compliance period ends, each source surrenders allowances to the implementing regulatory agency to cover the quantity of pollutant that was emitted in the compliance period.[114] There is a sixty-day period after the end of the compliance period in which sources have the opportunity to buy and sell allowances.[115]

There are also some important differences in the design of the two programs.[116] The Acid Rain Program is a national program administered by the EPA.[117] It was passed into law in 1990 as Title IV of the Clean Air Act Amendments, and it came into effect in 1995.[118] The policy goal of the Acid Rain Program was to reduce acid deposition caused by the long-range transport of sulfur dioxide ("SO_2") emissions.[119] The RECLAIM program is a regional program administered by the South Coast Air Quality Manage-

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available at http://www.ecologic.de/download/dinner_dialogue/2005/tools_of_the_trade.pdf [hereinafter TOOLS OF THE TRADE].

109. *Id.*

110. *Id.*

111. *See id.*

112. *Cf.* Swift, *How Environmental Laws Work*, *supra* note 1, at 320-21.

113. TOOLS OF THE TRADE, *supra* note 108, at 1-2.

114. *Id.*

115. *Id.* at 3-23.

116. For a detailed comparison of the design parameters of the two programs, *see* Reimund Schwarze & Peter Zapfel, *Sulfur Allowance Trading and the Regional Clean Air Incentives Market: A Comparative Design Analysis of Two Major Cap-and-Trade Permit Programs?*, 17 ENVTL. & RESOURCE ECON. 279 (2000).

117. *See* EPA, Acid Rain Program, http://www.epa.gov/airmarkets/progsregs/arp/index.html (last visited Apr. 21 (2007) (demonstrating that the Acid Rain Program it is a program of the EPA).

118. Burtraw & Swift, *supra* note 1, at 10,411.

119. Schwarze & Zapfel, *supra* note 116, at 280. This article will focus on the aspects of the Acid Rain Program that regulates SO_2. While nitrogen oxides ("NO_X") are regulated under the Acid Rain Program as well, they are not regulated through a cap

ment District ("SCAQMD"), the political subdivision in California responsible for air pollution control in the South Coast Air Basin, consisting of Orange County, and parts of Los Angeles, San Bernardino, and Riverside Counties.[120] The RECLAIM program was adopted by the SCAQMD in 1993 and came into effect in 1994.[121] The policy goal of the RECLAIM program was to bring the South Coast Air Basin into compliance with NAAQS for ozone and particulate matter by regulating SO_2 and NO_X.[122]

The universe of sources in the Acid Rain Program includes almost all electric generating plants throughout the United States. In Phase I of the Program, covering years 1995 to 1999, the 263 largest coal-fired electric generation units were included.[123] In Phase II of the program, beginning in 2000, all fossil-fuel fired electric generating units with an output capacity greater than twenty-five megawatts were added to the program universe.[124] The sources covered by the RECLAIM program are more heterogenous than those of the Acid Rain Program, including not only power plants, but also refineries, chemical manufacturers, paper mills, and a wide variety of other industrial sources that emit four or more tons of NO_X or SO_2 annually.[125] At the beginning of the RECLAIM program, the universe numbered 394 facilities, including 392 NO_X emitters and 41 SO_2 emitters.[126]

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and trade program. For detailed analysis and comparison of each, see Swift, *How Environmental Laws Work*, *supra* note 1.

120. *See* South Coast AQMD, About South Coast AQMD, http://www.aqmd.gov/aqmd/index.html#What_is_the_AQMD (last visited Apr. 20 (2007).

121. Schwarze & Zapfel, *supra* note 116, at 294, fn. 6.

122. *Id.* at 280.

123. *See* A. DENNY ELLERMAN ET AL., MARKETS FOR CLEAN AIR: THE U.S. ACID RAIN PROGRAM 6 (2000).

124. *Id.* at 6, 8 (2000). In 2004, 3,391 generating units were subject to the Acid Rain program. CLEAN AIR MKTS. DIV., OFFICE OF AIR & RADIATION, EPA, ACID RAIN PROGRAM 2004 PROGRESS REPORT: 10 YEARS OF ACHIEVEMENT 4 (2005) [hereinafter, ACID RAIN PROGRAM REPORT 2004].

125. SOUTH COAST AIR QUALITY MGMT. DIST., Regulation *XX: Regional Clean Air Incentives Market, Rule 2001 – Applicability* 2001-1 to 2001-2 (2005), *available at* http://www.aqmd.gov/rules/reg/reg20/r2001.pdf; *see also* James M. Lents, *The RECLAIM Program (Los Angeles' Market-Based Emissions Reduction Program) at Three Years*, *in* EMISSIONS TRADING: ENVIRONMENTAL POLICY'S NEW APPROACH 219, 223 (Richard F. Kosobud ed., 2000). For a complete list of types of facilities included in the RECLAIM program, see, e.g., SUE LIEU ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., RECLAIM PROGRAM THREE-YEAR AUDIT AND PROGRESS REPORT apps. A, B (1998), *available at* http://www.aqmd.gov/hb/1998/ 980539a.html [hereinafter THREE-YEAR AUDIT *See* A. DENNY ELLERMAN ET AL., MARKETS FOR CLEAN AIR: THE U.S. ACID RAIN PROGRAM 6 (2000).].

126. DANNY LUONG ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., ANNUAL RECLAIM AUDIT REPORT FOR THE 2004 COMPLIANCE YEAR 1-2 (2006) [hereinafter RE-

Both the Acid Rain and the RECLAIM programs established a series of declining annual caps. Under the Acid Rain Program, from 1995 to 1999, the cap for Phase I sources declined from 8.7 to 7 million tons worth of SO_2 allowances.[127] For the years 2000 to 2009, with the inclusion of Phase II sources, the cap was set at 9.2 million tons worth of allowances.[128] Finally, in 2010 and thereafter, the cap is reduced to 8.95 million tons worth of allowances, which is about 50% of the amount of SO_2 emitted by all electric generating units in 1980.[129] Allowances not utilized by a unit in a given year could be "banked" for use in a future year.[130] The RECLAIM program was designed such that the annual weighted average reduction in allowances for all facilities was 8.3% of initial allocations for NO_X and 6.8% of initial allocations for SO_X.[131] In actual operation, the cap declined from 40,127 tons of NO_X and 10,365 tons of SO_2 in 1994 to 12,484 tons of NO_X and 4,292 tons of SO_2 in 2003.[132]

B. The Compliance Equation

Compliance in cap and trade programs is inherently much more ascertainable and quantifiable than compliance in traditional regulation. Compliance in cap and trade has the simplicity of mathematical equation. Compliance is determined by comparing a facility's emissions with its allowance holdings.[133] Disassociated from facility-specific environmental performance, compliance in cap and trade signals participation in the regulatory program rather than environmental improvements.

A source is out of compliance in a cap and trade program if it does not have enough allowances to cover its reported emis-

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CLAIM AUDIT 2004]. At the end of the 2004 compliance year, the universe consisted of 311 facilities, including 311 NO_X emitters and 33 SO_2 emitters. *Id.*

127. ENVIRONMENTAL DEFENSE, FROM OBSTACLE TO OPPORTUNITY: HOW ACID RAIN EMISSIONS TRADING IS DELIVERING CLEAN AIR 5 (2000).

128. *Id.*

129. *Id.*

130. *See* TOOLS OF THE TRADE, *supra* note 108, at 1-3.

131. Scott Lee Johnson & David M. Pekelney, *Economic Assessment of the Regional Clean Air Incentives Market: A New Emissions Trading Program for Los Angeles*, 72 LAND ECON. 277, 281 (1996).

132. *Compare* MITCH HAIMOV ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., SECOND ANNUAL RECLAIM PROGRAM AUDIT REPORT (1997) [hereinafter RECLAIM AUDIT 1995], *with* DANNY LUONG ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., ANNUAL RECLAIM AUDIT REPORT FOR THE 2003 COMPLIANCE YEAR 3-3, 3-5 (2005) [hereinafter RECLAIM AUDIT 2003].

133. *See* TOOLS OF THE TRADE, *supra* note 108, at 1-2.

sions.[134] Such cap violations are detected at the time of "annual reconciliation," a specified date after the end of the reporting year when the regulatory agency compares facility emissions with the number of allowances held.[135] In order to solve the compliance equation (compliance = allowances – emissions) for each facility in a cap and trade program, a significant amount of data is required. Specifically, the regulator requires data on both the emissions levels of each facility over the reporting period and the number of allowances that each firm possesses at the time of annual reconciliation.

Strict monitoring, reporting, and verification rules are essential to the success of a cap- and-trade program in a way that they are not essential to the success of traditional regulation. As explained by Benkovic and Kruger, "[f]or an emissions market to develop, there must be confidence that emissions will be correctly measured and reported, that compliance will be verified, and, if there is noncompliance, that a significant cost will be assessed."[136] If a source is able to underreport its emissions, then it will have to surrender fewer allowances at the end of the compliance period, and the cap may be reported as being met, but not be met in fact. Moreover, that source will gain an unfair advantage in the marketplace because it will be able to sell its excess allowances. The greater supply of allowances on the market will, in turn, decrease the value of allowances, undermining the incentives that other facilities have to invest in emissions reductions. As several commentators have noted, without reliable monitoring there is no confidence in the market: "these data are the 'gold standard' that backs up the currency of emissions allowances."[137] Reliable monitoring instills "confidence" by verifying the existence and value of the traded allowance.[138]

The Acid Rain Program and RECLAIM both set in place stringent technology requirements for monitoring and reporting emis-

134. *See id.*; *but see* Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 345 (pointing out a second type of noncompliance: a reporting violation, where a source's actual emissions exceed its reported emissions).

135. CLEAN AIR MARKET PROGRAMS, EPA, CAP AND TRADE: ACID RAIN PROGRAM BASICS 2, *available at* http://epa.gov/airmarkets/cap-trade/docs/arbasics.pdf.

136. Benkovic & Kruger, *To Trade or not to Trade?*, *supra* note 65, at 956.

137. Blas Pérez Henríquez, *Information Technology: The Unsung Hero of Market-Based Environmental Policies*, RESOURCES, Fall/Winter 2004, at 9, 11, *available at* http://downloads.heartland.org/14780.pdf; *see also* Richard F. Kosobud, *Emissions Trading Emerges from the Shadows*, *in* EMISSIONS TRADING: ENVIRONMENTAL POLICY'S NEW APPROACH, *supra* note 125, at 3, 30-31.

138. Henríquez, *supra* note 137, at 11.

sions.[139] In the Acid Rain program, 36% of the regulated units, together accounting for 96% of emissions in the program, are equipped with continuous emission monitoring systems ("CEMS").[140] Installed on the pollution source, CEMS electronically measure actual emissions of SO_2 and other gases on a continuous basis.[141] The CEMS data is then compiled by the source for submission to the EPA on a quarterly basis.[142] After receiving the quarterly data, the agency runs protocols to check the data for completeness.[143] The extent to which the CEMS data collection and submission processes are automated is considered to reduce opportunities for submitting false data.[144]

In the RECLAIM program, "major" sources of both NO_X and SO_X are required to use CEMS and report data to the agency on a daily, rather than a quarterly, basis.[145] A major source includes any source that emits ten or more tons of NO_X per year.[146] About 15% of sources regulated under RECLAIM are major sources, accounting for 84% of total NO_X emissions and 98% of total SO_X

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139. Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 350; *see also* 40 C.F.R. Part 75 (2006).

140. JOE KRUGER & CHRISTIAN EGENHOFER, CTR. FOR EUROPEAN POL'Y STUD., POL'Y BRIEF NO. 99, CONFIDENCE THROUGH COMPLIANCE IN EMISSIONS TRADING MARKETS 3 n.12 (2006), available at http://shop.ceps.be/downfree.php?item_id=1323 [hereinafter KRUGER & EGENHOFER, POL'Y BRIEF]. CEMS are expensive with an average annual cost of about $124,000 per unit, amounting to 7% of compliance costs in 1995. Henríquez, *supra* note 137, at 11. For general information about CEMS, see EPA, Continuous Emissions Monitoring Fact Sheet, http://www.epa.gov/airmarkets/emissions/continuous-factsheet.html (last visited Apr. 24, 2007). Other units generally quantify emissions by measuring fuel input and multiplying it by an emissions rate. *See* KRUGER & EGENHOFER, POL'Y BRIEF, *supra* note 140, at 3.

141. Henríquez, *supra* note 137, at 11.

142. KRUGER & EGENHOFER, POL'Y BRIEF, *supra* note 140, at 4.

143. Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 349 (stating that every emissions report sent to the EPA is subject to a series of reviews to verify accuracy and determine compliance).

144. John K. Stranlund, Christopher Costello & Carlos A. Chávez, *Enforcing Emissions Trading when Emissions Permits are Bankable*, 28 J. OF REG. ECON. 181, 182 (2005).

145. SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2012 Appendix A: Protocol – Chapter 1* 2012A-1-1 (2005), http://www.aqmd.gov/rules/reg/reg20/r2012_chap_1.pdf [hereinafter *Rule 2012 Appendix A: Protocol – Chapter 1*]; SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2011 Appendix A: Protocol – Chapter 1* 2011A-1-1 (2005), http://www.aqmd.gov/rules/reg/reg20/r2011_chap_1.pdf [hereinafter *Rule 2011 Appendix A: Protocol – Chapter 1*]. Under RECLAIM, a single facility may have more than one "source." *See* THREE-YEAR AUDIT, *supra* note 125, app. A. In 1996, for example, there were 329 RECLAIM facilities and 4,022 sources. *See id.* at 1-1 & 7-63 tbl.5-1.

146. *Rule 2012 Appendix A: Protocol – Chapter 1*, *supra* note 145, at 2012A-1-6. For a full definition of a major source see *id.*

emissions.[147] "Large" sources are required to report on a monthly basis, and they calculate emissions by measuring fuel input and multiplying the fuel input by an appropriate emission rate.[148] Large sources include those that emit more than 4 tons but less than 10 tons of NO_X.[149] They constitute about 18% of all sources and contribute about 8% of NO_X emissions.[150] Finally, an additional category of "process units" constitutes about two-thirds of all sources and 6% of NO_X emissions.[151] Process units are required to report on a quarterly basis, and they calculate emissions either like large sources or by keeping track of their operating time and multiplying the time by an appropriate emission factor.[152]

Both the Acid Rain Program and RECLAIM include "missing data provisions" to minimize the underestimation of emissions.[153] Missing data provisions set forth the manner in which emissions will be estimated when actual data is unavailable because of monitoring equipment failure or other reasons.[154] The missing data provisions become increasingly punitive as the amount of time in which actual data is unavailable increases.[155] If monitoring equipment is inoperative less than 90% of the time, the emissions value substituted for each missing hour is the maximum value re-

147. *See* THREE-YEAR AUDIT, *supra* note 125, at 5-8 to 5-9.

148. *Rule 2012 Appendix A: Protocol – Chapter 1*, *supra* note 145, at 2012A-1-1; *see* Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 349.

149. *Rule 2012 Appendix A: Protocol – Chapter 1*, *supra* note 145, at 2012A-1-7. For a full definition of a large source, see *id.*

150. *See* THREE-YEAR AUDIT, *supra* note 125, at 5-8 to 5-9.

151. *See id.* For full definition of a process unit, see *Rule 2012 Appendix A: Protocol – Chapter 1*, *supra* note 145, at 2012A-1-8.

152. *Rule 2012 Appendix A: Protocol – Chapter 1*, *supra* note 145, at 2012A-1-1; *Rule 2011 Appendix A: Protocol – Chapter 1*, *supra* note 145, at 2011A-1-1. The emission factors for the calculation of emissions by process units do not tend to be source-specific. CALIFORNIA AIR RESOURCES BOARD (CARB), *An Evaluation of the South Coast Air Quality Management District's Air Pollution Control Program Appendix A: South Coast AQMD Comments on ARB Draft Program Evaluation* Addendum, at 6 (Jan. 2000) [hereinafter *An Evaluation of SCAQMD's APCP*].

153. Benkovic & Kruger, *To Trade or not to Trade?*, *supra* note 65, at 955. For such provisions under RECLAIM, see SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2011 Appendix A: Protocol – Chapter 2* 2011A-2-29 to 2011A-2-36 (2005), http://www.aqmd.gov/rules/reg/reg20/ r2011_chap_2.pdf [hereinafter *Rule 2011 Appendix A: Protocol – Chapter 2*]; SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2012 Protocol: Appendix A* 2012A-2-31 to 2012A-2-40 (2005), http://www.aqmd.gov/rules/reg/reg20/r2012_chap_2.pdf.

154. *See generally Rule 2011 Appendix A: Protocol – Chapter 2.*

155. *See generally id.*

corded in a previous time period.[156] Given that the substitute data is likely to overestimate actual emissions, sources have a strong incentive to ensure than CEMS data is available. The RECLAIM missing data provisions were modeled after the Acid Rain Program missing data provisions and are similar.[157]

The data-intensity of compliance determinations in cap and trade programs has necessitated the development of sophisticated data management tools. Regulators must not only monitor emissions, but also keep track of the source's participation in the trading markets. Indeed, information technology has been called the "unsung hero" of the Acid Rain Program.[158] Technological advances in information technology permitted the EPA to design systems that could process and disseminate large amounts of information about emissions and allowances.[159] An Emissions Tracking System receives electronic quarterly reports of emissions data from sources, conducts quality assurance protocols, and makes the emissions data available to the public.[160] An Allowance Tracking System serves as the central registry of allowance transfers among sources.[161]

With strict monitoring requirements, compliance determinations are much more straightforward and objective in cap and trade than in traditional regulation. From 1995 to 1999, all units included in the Acid Rain Program were in compliance with their emissions caps.[162] From 2000 to 2004, compliance levels each year remained above 99%.[163] Over these years, a total of 23 units

156. EPA, Continuous Emissions Monitoring Fact Sheet, http://www.epa.gov/airmarkets/emissions/continuous-factsheet.html (last visited Apr. 24, 2007); *see also Rule 2011 Appendix A: Protocol – Chapter 2*, *supra* note 153, at 2011A-2-31; SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2012 Protocol: Appendix A* 2012A-2-34 (2005), http://www.aqmd.gov/rules/reg/reg20/r2012_chap_2.pdf.

157. *Compare Rule 2011 Appendix A: Protocol – Chapter 2*, *supra* note 153, at 2011A-2-29 to 2011A-2-36, *and* SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2012 Appendix A: Protocol – Chapter 2*, *supra* note 153, 2012A-2-31 to 2012A-2-40, *with* EPA, Continuous Emissions Monitoring Fact Sheet, http://www.epa.gov/airmarkets/emissions/continuous-factsheet.html (describing the Acid Rain Program's missing data provisions).

158. *See* Henríquez, *supra* note 137, at 11.

159. *See* Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 348-49.

160. Henríquez, *supra* note 137, at 11; *see also* Kruger, McLean & Chen, *supra* note 107, at 119-20, 123-25.

161. Henríquez, *supra* note 137, at 10-11; *see also* Kruger, McLean & Chen, *supra* note 107, at 120-23, 125.

162. *See supra* note 104 and accompanying text.

163. *Id.*

have been noncompliant, emitting 1,195 excess tons of SO_X; for these violations, the EPA assessed automatic monetary penalties totaling $3,856,513.[164] The highest single fine was in the amount of $1,581,180.[165] In addition, over the lifetime of the SOx program, the EPA has assessed nine civil penalties totaling $589,805 for monitoring violations.[166]

In the RECLAIM program, some sources have reporting years running from January through December and others have reporting years running from July through May. In either case, the period of reconciliation ends 60 days after the end of the reporting years.[167] At this time, each facility is required to submit an Annual Permit Emissions Program report certifying its emissions for the preceding compliance year.[168] The SCAQMD then conducts an audit for each facility that includes field inspections to check equipment, monitoring devices, operational records, as well as verification of reported emissions data.[169] When the compliance audit reveals a facility to be in exceedence of its allowance holdings, the facility is provided an opportunity to review the audit and to "present additional data to further refine the audit results."[170]

While the RECLAIM program followed the Acid Rain Program model in designing its compliance and enforcement provisions, there is some evidence that it has not been implemented as

164. Interview with EPA official (Jan. 6, 2006). In comparison with information received from the EPA in 2005, the EPA's Annual Progress Reports regarding the Acid Rain Program for the years 2000 and 2001 underreport the number of units out of compliance and excess tons: for 2000, the Annual Progress Report states that there were six units out of compliance with total excess emissions of fifty-four allowances. CLEAN AIR MARKETS DIV., OFFICE OF AIR & RADIATION, EPA, ACID RAIN PROGRAM: ANNUAL PROGRESS REPORT, 2000 at 8 (2001), *available at* http://www.epa.gov/airmarkets/progress/docs/2000report.pdf. 2005 information shows eight units out of compliance with total excess emissions of seventy tons. For 2001, the Annual Progress Report states that there were two units out of compliance with total excess emissions of eleven allowances. CLEAN AIR MARKETS PROGRAM, OFFICE OF AIR & RADIATION, EPA, EPA ACID RAIN PROGRAM: 2001 PROGRESS REPORT 7 (2002), *available at* http://www.epa.gov/airmarkets/progress/docs/2001report.pdf. 2005 information shows nine units out of compliance with total excess emissions of 603 tons.

165. Interview with EPA official (Jan. 6, 2006).

166. *Id.*

167. DANNY LUONG ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., ANNUAL RECLAIM AUDIT REPORT FOR THE 2001 COMPLIANCE YEAR F-38(2003) [hereinafter RECLAIM AUDIT 2001].

168. *Id.*

169. THREE-YEAR AUDIT, *supra* note 125, at 7-58; *see also* Stranlund, et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 349.

170. THREE-YEAR AUDIT, *supra* note 125, at 7-58.

fully and has not worked as well. RECLAIM compliance audits, for example, have often revealed errors and problems. Early in the program, in 1994 and 1995, audits showed that almost 40% of reported NO_X emissions and almost 25% of reported SO_X emissions were inconsistent with the audited emissions.[171] Facilities also made ample use of missing data provisions, indicating the unavailability of reliably monitored emissions. In 1995, emissions estimated according to missing data provisions represented 23% of total reported NO_X emissions and 40% of total reported SOx emissions.[172] These percentages tended to decrease, such that by 1999, about 9% of total reported NO_X emissions and 20% of total reported SO_X emissions were calculated based on missing data provisions.[173]

Importantly, the years between 1994 and 1999 were characterized by an abundance of cheap RECLAIM allowances. NO_X allowance prices averaged $665/ton over these years and were easily available on the market.[174] However, despite this availability, there was not full compliance. Noncompliance with facility allocations ranged from 5% to 15% of facilities.[175] SCAQMD attributed noncompliance with allocations to several types of problems including failure to purchase sufficient allowances on the market, emission calculation errors such as using the wrong emission factor or making arithmetic errors, and failures to follow missing data provisions.[176]

Reports prepared by the California Air Resources Board ("CARB") and the EPA identified several problems associated with compliance and enforcement in the RECLAIM program.[177] CARB

171. *See* RECLAIM AUDIT 1995, *supra* note 132, at 38 tbl.5-3, 39 tbl.5-4.

172. RECLAIM AUDIT 1995, *supra* note 132, at 3-3.

173. RECLAIM AUDIT 2001, *supra* note 167, at F-41.

174. *See* RECLAIM AUDIT 1995, *supra* note 132, at 2; DANNY LUONG ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., ANNUAL RECLAIM AUDIT REPORT FOR THE 1997 COMPLIANCE YEAR 2 (1998) [hereinafter RECLAIM AUDIT 1997]; DANNY LUONG ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., ANNUAL RECLAIM AUDIT REPORT FOR THE 1999 COMPLIANCE YEAR 3 (2001) [hereinafter RECLAIM AUDIT 1999].

175. Calculated from data provided in Annual RECLAIM Audit Reports for years 1995 through 1999. *See* RECLAIM AUDIT 1995, *supra* note 132, at 29-30; RECLAIM AUDIT 1997, *supra* note 174; ANNUAL RECLAIM AUDIT REPORT FOR THE 1998 COMPLIANCE YEAR (1998) [hereinafter RECLAIM Audit 1998]; RECLAIM AUDIT 1999, *supra* note 174.

176. *See, e.g.*, RECLAIM AUDIT 1995, *supra* note 132, at 30-31; DANNY LUONG ET AL., SOUTH COAST AIR QUALITY MGMT. DIST., ANNUAL RECLAIM AUDIT REPORT FOR THE 2002 COMPLIANCE YEAR 5-3 (2004) [hereinafter RECLAIM AUDIT 2002].

177. AN EVALUATION OF SCAQMD'S RECLAIM, *supra* note 3; *An Evaluation of SCAQMD's APCP*, *supra* note 152.

found that insufficient weight was given to missing data procedures during case settlement.[178] While it found that District staff correctly calculated excess emissions using the missing data procedures, the District provided the facility the opportunity to demonstrate that its actual emissions were lower through other means during case settlement. Since the punitive effects of the missing data provisions would not ultimately be felt under these circumstances, the incentives to avoid the application of missing data provisions would forseeably be lowered.[179] The CARB report also found "inordinate" time gaps between documentation of cap violations and issuances of a violation notice and "excessive" time for case settlement after a violation notice was issued.[180] The EPA report noted problems with the automation of SCAQMD's information systems and delays in facility audits.[181]

In 2000, the RECLAIM program ran into other difficulties. Power-producing facilities increased their power production in response to the California "energy crisis."[182] Attempting to remain compliant with RECLAIM, these facilities bought allowances on the market which caused a drastic increase in the price of the allowances.[183] The average price of NO_X allowances sold in 2000, $45,609/ton, was almost 25 times greater than the average price of allowances sold in 1999.[184] Relatedly, RECLAIM's NO_X cap was significantly exceeded in 2000. Power producing facilities collectively exceeded their allowance holdings by 40%.[185] Non-power producing facilities sold so many allowances that their holdings did not cover their emissions, and they collectively exceeded their allowance holdings by 11%.[186] In total, all facilities together exceeded the 2000 NO_X cap in 2000 by 3,294 tons, or 19%.[187]

In the wake of the significant degree of noncompliance and excess emissions, SCAQMD initiated a review of the program in

178. *An Evaluation of SCAQMD's APCP*, *supra* note 152, at V-3

179. *Cf.* AN EVALUATION OF SCAQMD'S RECLAIM, *supra* note 3, at 64.

180. *An Evaluation of SCAQMD's APCP*, *supra* note 152, at V-3.

181. AN EVALUATION OF SCAQMD'S RECLAIM, *supra* note 3, at 31-32.

182. *See* Danny Luong et al., South Coast Air Quality Mgmt. Dist., Annual RECLAIM Audit Report for the 2000 Compliance Year 2, 5-2 – 5-3 (2002) [hereinafter RECLAIM Audit 2000].

183. *See id.*

184. *See id.* at 3.

185. In 2000, power-producing facilities were initially allocated 2,302 tons of allocations, held 4,852 RECLAIM trading credits, but they emitted 6,788 tons of NO_X. *See* RECLAIM AUDIT 2001, *supra* note 167, at F-23.

186. *See id.*

187. *See id.*

2000 that culminated in the adoption of significant amendments to RECLAIM in May 2001.[188] Power-producing facilities were separated from the rest of the RECLAIM facilities and were required to submit compliance plans by September 2001 delineating a schedule for the installation of "Best Available Retrofit Control Technology" by the end of 2003.[189] In effect, power-producing facilities were removed from the market and subjected to a technology-based standards regime. Most other RECLAIM facilities were required either to submit compliance plans specifying their approaches to complying with facility allocations or forecast reports projecting allocations for future compliance years through 2005.[190] As such, while not removed from the market or automatically required to install pollution control technologies, they were required to communicate much more extensively than before about how they intended to comply. In these ways, the RECLAIM program was replaced by and/or supplemented by a "command and control" regulatory approach.

After the implementation of the 2001 amendments, significant NO_X emissions reductions were achieved. Emissions from power plants decreased from 6,788 tons in 2000 to 1,047 tons in 2002, an 85% reduction.[191] As stated in the 2002 Annual Report, "[t]he decrease in emission was due to the combination of a lower production level and the installation of NO_X control equipment at power producing facilities."[192] By compliance year 2004, power producing facilities had reduced their emissions to 541 tons, more than a 90% reduction from their 2000 emissions levels.[193] Non-

188. *Id.* at F-30 to F-31. The RECLAIM rules provide that SCAQMD review the program and implement measures to amend the program in the event that aggregate emission exceeded the allocations by 5% or more or the average price of allowances exceeded $15,000). *See* SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2015: Backstop Provisions* 2015-3 to 2015-4, 2015-6 (2004), http://www.aqmd.gov/rules/reg/reg20/r2015.pdf.

189. *See* SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market, Rule 2009: Compliance Plan for Power Producing Facilities* (2005), http://www.aqmd.gov/rules/reg/reg20/r2009.pdf. Fourteen facilities were subject to this rule, accounting for about 13% of Year 2000 allowances. *See* RECLAIM AUDIT 2001, *supra* note 167, at F-31.

190. *See* SOUTH COAST AQMD, *Regulation XX: Regional Clean Air Incentives Market (RECLAIM) Rule 2009.1: Compliance Plans and Forecast Reports for Non-Power Producing Facilities* 2009.1-1, 2009.1-1 to 2009.1-4 (2001), http://www.aqmd.gov/rules/reg/reg20/r2009-1.pdf; *see also* RECLAIM AUDIT 2001, *supra* note 167, at F-26 to F-27. Forty-one facilities were required to submit such compliance plans and twenty-four facilities were required to submit forecast reports. *Id.* at F-31.

191. RECLAIM AUDIT 2002, *supra* note 176, at 3-3 to 3-4.

192. *Id.* at 3-3.

193. RECLAIM AUDIT 2004, *supra* note 126, at 3-3 to 3-4.

power producing facilities decreased their emissions by 17% between 2001 and 2002, with an additional 2% reduction between 2003 and 2004.[194]

In their early years, the Acid Rain and RECLAIM programs were both able to boast of significant overcompliance with the overall cap.[195] Yet, to a large degree, this overcompliance was a product of generous caps rather than program-induced emissions reductions. In the Acid Rain Program, the 1995 cap was set at a level roughly equivalent to actual 1990 emissions, and the utilities overcomplied by roughly 30% in the first year.[196] In the RECLAIM program, the NO_X cap for 1994 was set 40% higher than actual 1993 emissions.[197] The cap did not descend to the level of actual 1993 emissions until 1998, five years into the program.[198] In most of those years, there was significant overcompliance with the program due almost entirely to the elevated levels of the annual caps.

C. Automatic Enforcement

In addition to redefining compliance, cap and trade regulation redefined the roles of the regulatory agencies and regulated firms and the relationships between them. Regulators are no longer responsible for either coercing or persuading a company to reduce its emissions. Rather, the agency is primarily a "banker," responsible for keeping track of emissions and allowances and making sure the checkbook balances at the end of the reporting year.[199] The firm, in turn, is expected to be a "strategic planner," a savvy financial and environmental actor who knows how to manage his pollution.

The role of the regulator is that of a banker or accountant who focuses on the accurate tracking of emissions and allowances.[200] In cap and trade programs, government agencies assume respon-

194. *See* RECLAIM AUDIT 2001, *supra* note 167, at 3-4 tbl.3-3; RECLAIM AUDIT 2002, *supra* note 176, at 3-4 tbl.3-3; RECLAIM AUDIT 2003, *supra* note 132, at 3-4 tbl.3-3; RECLAIM AUDIT 2004, *supra* note 126, at F-23 tbl.3-3.

195. *See, e.g.*, Swift, *How Environmental Laws Work*, *supra* note 1, at 321-22, 325; RECLAIM AUDIT 1995, *supra* note 132, at 29-30.

196. Swift, *How Environmental Laws Work*, *supra* note 1, at 325, 411.

197. *See* THREE-YEAR AUDIT, *supra* note 125, at 3-3, Table 3-1.

198. *See* RECLAIM AUDIT 1998, *supra* note 175, at 3-2, Table 3-1. Actual 1993 emissions were 24,982 tons of NO_X. THREE-YEAR AUDIT, *supra* note 125, at 3-3. The 1998 cap was 24,678 tons of NO_X. RECLAIM AUDIT 1998, *supra* note 175, at 3-2, Table 3-1.

199. Kruger, *Companies and Regulators*, *supra* note 63, at 10.

200. *Id.*

sibility for "strict compliance monitoring."[201] Regulators are primarily concerned with collecting, verifying and utilizing data on emissions and the transfer of emissions allowances to ensure that companies hold sufficient allowances to cover their emissions.[202] One commentator calls the new role of regulators in emissions trading regulation "'revolutionary.'"[203] The regulator's previous role was "grandly deciding what is best for firms and individuals, entertaining equitable appeals, and enforcing the result."[204]

The emphasis on tracking emissions and allowance data is evident in the distribution of regulatory resources in cap and trade programs. It has been estimated that of the seventy-five EPA employees directly involved in administering the Acid Rain Program, approximately 75% are focused on the measurement, verification, and tracking of emissions data.[205] The implementation of emissions monitoring requirements is one of the few areas of program administration that still involves agency judgments to be made. Yet this discretion is tightly constrained.[206] The monitoring rules in the Acid Rain Program number almost 300 pages and include detailed standards for the installation and certification of monitors, quality assurance, handling of missing data, and record-keeping.[207] In implementing these rules, the EPA has developed an almost 500-page online policy manual.[208] The manual is largely in question and answer format, publicizing the responses that the EPA has given to the many questions about the monitoring rules that have arisen over the lifetime of the program.[209]

The new role of industry in cap and trade regulation is that of "strategic planner and entrepreneur."[210] Companies can be strategic and entrepreneurial because cap and trade programs allow companies a wider range of options about how to comply than traditional regulation.[211] There is evidence that under cap and

201. Swift, *How Environmental Laws Work*, *supra* note 1, at 322.

202. Kruger, *Companies and Regulators*, *supra* note 63, at 10.

203. *Id.* (citing A. Denny Ellerman, *The Next Restructuring: Environmental Regulation*, 20 THE ENERGY J. 141, 144 (1999)).

204. Kruger, *Companies and Regulators*, *supra* note 63, at 10.

205. *Id.*

206. *See id.* at 11.

207. *See* 40 C.F.R. Part 75. *See also* Kruger, *Companies and Regulators*, *supra* note 63, at 11.

208. EPA, Part 75 Emissions Monitoring Policy Manual, http://www.epa.gov/airmarkets/emissions/monitoring.html (last visited Apr. 24, 2007).

209. *See id.*; Interview with EPA official (Jan. 6, 2006).

210. Kruger, *Companies and Regulators*, *supra* note 63, at 2.

211. *See id.* at 3.

trade regimes, companies have adopted interdepartmental approaches to integrate compliance planning into overall business strategy and have used sophisticated analytical tools to analyze alternative compliance scenarios.[212] Cap and trade programs allow companies greater flexibility to identify and implement the most cost-effective strategy given its own circumstances.[213]

In contrast to enforcement relationships in many traditional regulatory programs, interactions between regulators and regulated in cap and trade have tended to be "reasonably harmonious."[214] According to anecdotal evidence from the Acid Rain Program, industry officials are "generally satisfied with the interactions" they have with regulators.[215] Indeed, there is less friction between regulator and regulated because regulators are not engaged in an effort to persuade or coerce companies to reduce their emissions in specific ways. Companies are left alone to make the decision about when, how, and whether to install control technologies.[216] Given that regulators are no longer engaged in discretion-laden judgment calls about typical company compliance, it is not surprising that enforcement relationships are more harmonious. The regulators are focused in verifying emission data rather than influencing compliance choices.

Moreover, citizens and citizen groups are removed from the enforcement process in cap and- trade programs.[217] In traditional regulation, citizen groups had the opportunity to rally for facility-specific improvements, particularly when a facility was actually determined to be out of compliance with regulation.[218] In cap and trade programs, as discussed above, compliance is disassociated from facility-specific performance. Facilities that are in compliance with cap and trade programs can defend their records with their compliance status even if they have not taken what would have been considered economically and technologically feasible steps to reduce their emissions. In sum, citizen groups have di-

212. *Id.* at 4-7.

213. *Id.* at 2.

214. *Id.*

215. *Id.* at 13.

216. *See id.* at 2-3, 13-14; Swift *How Environmental Laws Work*, *supra* note 1, at 322.

217. *See* Richard Toshiyuki Drury, Michael E. Belliveau, J. Scott Kuhn & Shipra Bansal, *Pollution Trading and Environmental Injustice: Los Angeles' Failed Experiment in Air Quality Policy*, 9 DUKE ENVTL. L. & POL'Y F. 231, 278-79 (1999) (arguing that public participation suffers under a pollution trading regime).

218. *See supra* notes 101-03 and accompanying text.

minished opportunities to influence the environmental behavior of firms under a cap and trade program.[219]

Furthering the lack of conflict between the regulator and regulated, the Acid Rain Program has operated in a manner that has essentially made noncompliance economically irrational. An automatic penalty is assessed when a company does not have sufficient allowances to cover its emissions.[220] The penalty was statutorily set in 1990 at $2000/ton of SO_X.[221] Adjusted annually for inflation, the penalty had risen to $2,963/ton by 2004.[222] For the Acid Rain Program's entire lifetime, the price of a ton of sulfur dioxide on the allowance market remained below the value of this monetary penalty, averaging approximately $200/ton between 1995 and 2004.[223] In addition, the EPA deducts the company's allotment for the following year by the amount of the exceedence.[224]

Given that sources have several months after the end of the monitoring year in which to make a final determination of their total emissions and acquire allowances, any noncompliance with emission caps would be economically irrational.[225] In this way, compliance is a mere artifact of the fact that the price of an allowance on the market is lower than the excess emissions penalty. A rational economic actor will clearly choose to buy allowances in the market rather than be out of compliance.[226] By having a pen-

219. At least one lawsuit has been filed by a citizen group concerning enforcement in RECLAIM. *See* Cmtys. for a Better Env't v. Cenco Ref. Co., 179 F. Supp. 2d 1128 (C.D. Cal. 2001) (alleging violations of several California SIP rules relevant to RECLAIM).

220. *See* Swift, *How Environmental Laws Work*, *supra* note 1, at 321.

221. 42 U.S.C. § 7651j (1994). Additional discretionary penalties in the form of fines or surrender of additional allowances are also provided for, but have been rarely used. Interview with EPA official (Jan. 6, 2006).

222. ACID RAIN PROGRAM REPORT 2004, *supra* note 124, at 8.

223. *See id.* at 6; Kruger, *Companies and Regulators*, *supra* note 63, at 13 n.9.

224. Swift, *How Environmental Laws Work*, *supra* note 1, at 321; Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 350.

225. Stranlund et al, *Enforcing Emissions Trading Programs*, *supra* note 12, at 346 (showing that complete compliance will be guaranteed as long as the market price of a unit allowance remains less than both (1) the per unit fine for a cap violation (making a cap violation economically irrational) and (2) the probability that a reporting misrepresentation will get detected times the per unit fine for a reporting violation and a cap violation (making a reporting misrepresentation economically irrational)).

226. As recognized by theorists of cap-and-trade regulation, if market price is greater than the penalty, then firms will be expected to emit more pollution than the number of allowances they hold. Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 347.

alty for excess emissions greater than the market price of allowances, noncompliance is essentially designed out of a cap and trade program.[227]

For the first five years of the lifetime of RECLAIM, the situation was somewhat similar. Allowance prices were extremely inexpensive, such that noncompliance was basically economically irrational.[228] However, the RECLAIM program did not include automatic penalties for excess emissions, which may account in part for the less than 100% compliance rates.[229] RECLAIM facilities that are found through an audit to have emissions in excess of their allowances are provided the opportunity to review the audit and present additional data.[230] If after this review, the facility is found to be noncompliant, the facility's allocation of allowances for the following compliance year is automatically reduced by the amount of excess emissions, but there is no automatic monetary penalty.[231] Rather, RECLAIM administrators may apply administrative penalties of up to $500 for every 1,000 pound exceedence for every day the exceedence persists.[232] In addition, civil penalties of up to $75,000 per day of violation may be levied.[233] In contrast to the Acid Rain Program, in the RECLAIM program, monetary sanctions for cap violations are a matter of administrative discretion.

While not strictly followed by the RECLAIM program, the EPA lists objective and automatic penalties as a key component of cap and trade regulation. As stated in its guide to emissions trading regulation, "[r]egardless of the type and severity of penalties, they should be objective and automatic. Eliminating penalty negotiations between regulating authority and emission source promotes impartiality and equity and reduces opportunities for

227. *Cf.* Stranlund, Costello & Chávez *supra* note 144, at 182 (stating that two elements of the Acid Rain Program are deemed to have led to almost 100% compliance (1) automatic penalties that are higher than market price, and (2) CEMS which produce quarterly reports).

228. *See, e.g.*, RECLAIM AUDIT 1995, *supra* note 132, at 2. ($156/ton for NO_X; $142/ton for SO_X).

229. *See supra* note 105 and accompanying text.

230. Stranlund et al., *Enforcing Emissions Trading Programs*, *supra* note 12, at 350.

231. *Id.*; *see also* Schwarze & Zapfel, *supra* note 116, at 288.

232. Stranlund et al., *Enforcing Emissions Trading Programs, supra* note 12, at 350 (citing SCAQMD's Regulation XX RECLAIM, Rule 2004(d) for the definition of violations and Rule 2010(c) for procedures for assessing penalties). SCAQMD may also impose additional permit conditions to prevent further violations. *Id.* at n.15.

233. Interview with Joseph Panasiti; *see also* CAL. HEALTH AND SAFETY CODE § 42402 (2001).

dishonest behavior."[234] In addition to excess emissions penalties, both the Acid Rain Program and RECLAIM provide for penalties for misreporting emissions.[235] These penalties, however, are not automatically imposed.

IV. COMPLIANCE PLANS TO ENHANCE RELIABILITY IN CAP AND TRADE PROGRAMS

The idealized models of cap and trade leave no role for regulators in determining how companies comply. The theory is that the regulator should be merely the banker or accountant, and the less involved the regulator is with compliance decisions, the better the program works. However, in reality, this ideal model may only be appropriate for the most sophisticated sources in a regulatory universe. In the Acid Rain Program, where the regulatory universe consists of exclusively large stationary sources, this model has worked fairly well. Also, in the Acid Rain Program, a compliance option emerged that was economically attractive–the use of low-sulfur coal.[236]

However, in RECLAIM, where the regulatory universe consisted of less sophisticated sources and no "silver bullets" were available to reduce emissions, the cap and trade program failed to produce the type of strategic planning behavior that the ideal model suggests will occur in cap and trade.[237] Changes to the RECLAIM program instituted in 2001 after the RECLAIM market failure associated with the energy crisis reintroduced a tool out of the command-and-control toolbox: compliance plans. This section first describes the potential tradeoff between reliability and efficiency present in cap and trade programs. It then describes the problems that the RECLAIM program has experienced in reliably delivering emissions reductions and discusses how compliance plans were used in the RECLAIM program. These compliance plans expanded the roles of the regulators and brought persuasion, as well as some coercion, back into the compliance equation.

234. TOOLS OF THE TRADE, *supra* note 108, at 3-25.

235. *See* Clean Air Act Amendments of 1990, Pub. L. No. 101-549, § 412, 104 Stat. 2399 (codified as amended at 42 U.S.C. § 7651k (2000)).

236. *See* ELLERMAN ET AL., *supra* note 123, at 242, 245-46.

237. *Cf.* Lesley K. McAllister, *Beyond Playing "Banker": The Role of the Regulatory Agency in Emissions Trading*, 59 ADMIN. L. REV. 269, 277-79, 296-97 (2007).

A. The Potential Trade-off between Efficiency and Reliability

The implementation of cap and trade programs are most often justified based on the efficiency improvements they promise. Cap and trade programs are said to be more efficient mainly because they allow individual facilities flexibility in determining whether, when, and how to reduce their emissions.[238] A facility that confronts very high costs to reduce emissions may purchase allowances from a facility that has lower costs, thus reducing compliance costs per unit of pollution overall.[239] Companies may also modify their compliance approach freely depending on changes in market conditions. Implicit in this flexibility is a reduction in the conflict between regulator and regulated that used to pervade environmental regulation. Companies no longer have to spend so much time and resources negotiating with regulators about compliance. Litigation that used to be common with respect to setting, implementing, and enforcing technology-based standards is eliminated.

But something of value may also be lost in the different nature of the enforcement relationship under cap and trade programs: reliability. Reliance on the allowance market to spur reductions in emissions is only warranted where the market is adequately designed to achieve that end and where market participants are adept strategic planners. Otherwise, the market may fail to achieve the desired results. In such a case, there is the possibility that efficiency and flexibility will be gained at the cost of reliability and dependability.[240]

In traditional regulation, compliance was hinged to environmental performance at each particular facility. Regulators were charged with understanding the possibilities and constraints regarding emissions reductions faced by a facility and engaging in conversations with facility owners about facility-specific emissions

238. *See* ACID RAIN PROGRAM REPORT 2004, *supra* note 124, at 3.

239. *See* Dallas Burtraw, Alexander E. Farrell, Lawrence H. Goulder & Carla Peterman, *Chapter 5: Lessons for a Cap-and-Trade Program*, *in* MANAGING GREENHOUSE GAS EMISSIONS IN CALIFORNIA 5-1, 5-7, 5-22 (Cal. Climate Change Ctr. At UC Berkeley, 2006), *available at* http://calclimate.berkeley.edu/ 5_Cap_and_Trade.pdf [hereinafter Burtraw et al., *Lessons for a Cap-and-Trade Program*].

240. *Cf.* Neil Gunningham & Darren Sinclair, *Designing Smart Regulation*, *in* A READER IN ENVIRONMENTAL LAW, *supra* note 48, at 305, 308 ("Command and control regulation has virtues of high-dependability and predictability . . . , but commonly proves to be inflexible and inefficient. In contrast, economic instruments tend to be efficient but, in most cases, not dependable.").

reductions. Regulators were in a position to persuade and influence companies to reduce their emissions. In a cap and trade program, the role of the regulator is greatly diminished: to act as a mere accountant or banker. The "persuasion" that facilities experience to reduce emissions theoretically comes from the market for pollution allowances. As caps decline and allowance prices rise, facilities will find reducing their emissions to make financial sense. They will theoretically engage in the "strategic planning" behavior to reduce their emissions to the most efficient level.

Abandoning the governmentally-monitored incremental environmental improvement typical of traditional regulation, cap and trade relies on a government-created market to provide the "right" incentives for pollution reduction. This opens the program up to one of a variety of possible "market failures." As occurred in the RECLAIM program, the market might fail because allocation prices would reach high levels that closed off that avenue of compliance. Assuming the spike in prices was sudden, as it was in RECLAIM, facilities would be unprepared to reduce emissions in other ways.

B. Reliability Problems in RECLAIM

Compliance rates are not a very useful measure of the environmental effectiveness of a cap and trade program. Compliance by a particular facility does not effectively communicate whether that facility has reduced its emissions. Compliance by all facilities with the overall cap communicates that the cap was met, but overall caps may be set too high to be indicative of actual progress in pollution control and reduction. Rather, the best indication of the success of cap and trade programs is the amount of emissions reductions actually achieved by a program. On this score, the outcomes from the two major cap and trade programs are mixed.

The Acid Rain Program has had some important positive results on emissions reductions. Most significantly, emissions fell from 8.7 million tons to 5.3 million tons between 1990, when Title IV was passed, and 1995, when the Acid Rain Program came into effect.[241] Thereafter, between 1995 and 1999, emissions remained roughly constant, with an average of 5.3 million tons.[242] Comparing the emissions from both Phase I and Phase II sources in the five-year period from 1995 to 1999 and 2000 to 2004 also yields

241. ACID RAIN PROGRAM REPORT 2004, *supra* note 124, at 5 fig.2.
242. *See id.*

evidence that the program has resulted in emissions reductions. In the years 1995 to 1999, all sources together emitted, on average, 12.6 million tons of NO_X annually; in the years 2001 through 2004, the same sources emitted an average of 10.6 million tons, representing about a 15% reduction.[243] Notably, the Acid Rain Program provided a solution to what had been a legislative deadlock with respect to the regulation of the county's electric utilities.[244]

The RECLAIM program's record on emissions reductions is less clear. In contrast to the Acid Rain Program, the RECLAIM program replaced and subsumed a large set of traditional air pollution regulations that would have reduced emissions at the participating facilities in a predictable manner.[245] The RECLAIM program was designed such that the program would meet an emission reduction endpoint in 2003 that was equivalent to traditional regulation.[246] Ultimately, in response to the market disruptions caused by the energy crisis and to ensure that the program reached this endpoint, SCAQMD resorted to a drastic change in the program under which compliance plans were required of most of the market participants.

Even before the energy crisis, there were several signs that RECLAIM was not creating sufficient incentives for companies to reduce emissions. In the first three years of the program, 1994 through 1996, emissions remained at roughly the same level as 1993 emissions[247]. Years 1997 to 2000 showed some emissions reductions, with an annual average over this period of 17% less than in the 1994 to 1996 period.[248] Emissions reductions in 2001 through 2003 were much more drastic, steadily decreasing such

243. Calculations by author based on data provided in *Id.*

244. Swift, *How Environmental Laws Work*, *supra* note 1, at 318-19.

245. *See, e.g.*, ANNUAL RECLAIM REPORT FOR THE 1996 COMPLIANCE YEAR 2-2 (1996) [hereinafter RECLAIM AUDIT 1996] ("RECLAIM was designed to achieve emission reductions equivalent to the rules and control measures applicable to the universe of sources that would have been implemented by [SC]AQMD in the absence of RECLAIM. Therefore, the methodology for determining allocations was developed to incorporate the emission reduction requirements of the subsumed rules and control measures.").

246. *See* THREE-YEAR AUDIT, *supra* note 125, at 2-1, 2-2 tbl.2 ("Allocations are determined based on historical activity levels and the relative emission controls specified by the 1991 Air Quality Management Plan (AQMP) and are designed to match the AQMP emission projections for years 2000 and 2003, thus achieving emission reductions equivalent to the rules and control measures that RECLAIM subsumes.").

247. *See* RECLAIM AUDIT 1995, *supra* note 132, at 3-2, 3-3 tbl.3-1; RECLAIM AUDIT 1996, *supra* note 245, at 3-2 tbl. 3-1.

248. RECLAIM AUDIT 2004, *supra* note 126, at 3-3 tbl. 3-1.

that 2003 emissions were less than half of year 2000 emissions.[249] However reductions in this period were attributable to the compliance plans implemented in 2001.

> As a 2002 EPA evaluation of RECLAIM explains, the program was overallocated for the first few years of its operation.[250] Finally in 1999, the "cross-over point"—where the program cap would fall below actual historic emissions—was within sight. In 1999, the NO_X cap was 21,013 tons and the actual emissions were 20,775 tons, and in 2000, the NO_X cap was 17,197 tons. Yet, even at this point, few facilities were actively planning to install pollution control technologies, which often took a planning horizon of a couple years to bring on line. As stated by SCAQMD in its 1999 Annual Audit of the program: Unfortunately, even though [SC]AQMD has published figures [showing the prediction of the cross-over point] at least once each year starting in January 1996[251] the majority of RECLAIM facilities have relied on purchasing inexpensive [allowances] to bring their [allowance] holdings up to the level of their emissions rather than reducing their emissions to the level of their [allowance] holdings by making capital expenditures on emissions controls.[252]

In the Acid Rain Program, firms seem to have been more adept at reading and responding to the market signals. Yet, for different reasons, the Acid Rain Program does not provide strong empirical evidence that companies will fashion compliance plans that include the installation of pollution control technologies on their own without the persuasion and coercion exerted by a regulatory agency. In the Acid Rain Program, most facilities have complied not by installing pollution control technologies but by switching from high-sulfur to low-sulfur coal.[253] In addition to providing environmental benefits, the switch to low-sulfur coal ac-

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249. *See id.*

250. AN EVALUATION OF SCAQMD'S RECLAIM, *supra* note 3, at 32; *See also* STATIONARY SOURCE COMMITTEE, SOUTH COAST AIR QUALITY MGMT. DIST., BOARD MEETING AGENDA NO. 25, PROPOSAL TO AMEND REGULATION XX – REGIONAL CLEAN AIR INCENTIVES MARKET 2 (Jan. 7 2005) (stating that "the program was initially over allocated, which led to an under-utilization of available, cost-effective technologies").

251. Such figures are included in each Annual Audit Report (January 1996, February 1997, March 1998, March 1999, March 2000), Three-Year Audit and Progress Report (May 1998), Review of RECLAIM Findings (October 2000), and White Paper on Stabilization of NO_X RTC Prices (January 2001).

252. RECLAIM AUDIT 1999, *supra* note 174, at 2-9, 3-4.

253. *See* ELLERMAN ET AL., *supra* note 123, at 242, 245-46.

tually resulted in cost savings.[254] In Phase I of the program, fuel switching accounted for 59% of emissions reductions, installation of scrubbers contributed 35%, and the impact of retiring units contributed 6%.[255]

In the RECLAIM program, a significant compliance option that did not involve the installation of pollution control technologies was not available.[256] RECLAIM facilities, however, did not anticipate and plan for the installation of control technologies in the way that environmental regulators had foreseen they would. As reportedly stated by one EPA official, "For seven years, the program did absolutely nothing . . . . Businesses got used to cheap credits. Nobody did what they were supposed to do: responsible planning.'"[257] The EPA's 2002 evaluation of RECLAIM similarly discusses this issue:

> [W]hile long range economic planning is the intent of at least the larger sources, the market never arrived at the kind of steady state functioning that could overcome short term market dynamics and considerations. The initial overallocations and consequent deflation of credit prices undercut the market driver for many of the projected decision-making behaviors.[258]

In sum, the market failed to develop in such a way that forced or enabled facilities to undertake the type of short and long-term planning activities that were expected.

Given the lack of reliability of cap and trade programs, compliance plans may be a key aspect in the design of cap and trade programs. Indeed, in 2002, SCAQMD conceded that it would have been "desirable to require facilities to draft compliance plans early in program implementation."[259] Yet, compliance plans have not formed part of the ideal design of cap and trade. Rather, the emphasis in cap and trade design has been leaving decisions about how to comply with the facilities themselves. Regulators, in the ideal, are not supposed to be involved in compliance decisions. As

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254. *Id.*

255. Swift, *How Environmental Laws Work*, *supra* note 1, at 328-29.

256. AN EVALUATION OF SCAQMD'S RECLAIM, *supra* note 3, at 26 (stating that "most industries have relied on off-the shelf technologies to achieve reductions in emissions," while noting that some facilities were able to employ more innovative methods.)

257. Gary Polakovic, *Innovative Smog Plan Makes Little Progress*, L.A. TIMES, Apr. 17, 2001, at B1.

258. AN EVALUATION OF SCAQMD'S RECLAIM, *supra* note 3, at 58-59.

259. *Id.* app. F, at 5.

explained by SCAQMD, "Initially, [SC]AQMD believed that such requirements [for the drafting of compliance plans] were inconsistent with the theory of market-based programs, but perhaps a lesson learned from RECLAIM is that such programs need mechanisms beyond the market to assure long-range planning by facilities."[260]

C. Compliance Plans in RECLAIM

The compliance plans incorporated into RECLAIM in the wake of the noncompliance experienced in 2000 and 2001 provide a model of how compliance plans can work as either a backup or a supplement within a cap and trade program.

Rule 2009 of SCAQMD's RECLAIM rules required the fourteen power-producing facilities to install Best Available Retrofit Technology by the end of 2003.[261] This rule essentially removed these facilities from the cap and trade program and subjected them to a technology-based standard. Rule 2009.1(b) required the forty-one other facilities with NO_X emissions of fifty tons or more to submit compliance plans specifying their approaches to complying with the facility allocations.[262] These compliance plans were required to demonstrate that future RECLAIM allocations could be met, either through installation of controls, purchase of credits, or other qualified emission reduction strategies.[263] Rule 2009.1(e) required the twenty-four facilities with annual NO_X emissions between twenty-five and fifty tons to submit forecast reports projecting allocations Compliance for Years 2002 through 2005.[264] All compliance plans and forecast report were required to be submitted by September 2001.[265]

The compliance plans forced RECLAIM participants to plan over a multi-year horizon. This type of planning had been absent in the early years of the program. As stated by one industry

260. *Id.* SCAQMD also stated that "[i]t may not be feasible to rely on a 'pure' market-based program without requiring enforceable compliance plans from affected facilities." *Id.* app. F, at 7.

261. RECLAIM AUDIT 2001, *supra* note 167, at F-26. *See also id.* at F-31 (listing the number of facilities affected by each of the rule provisions).

262. *See id.*

263. DANNY LUONG, SOUTH COAST AIR QUALITY MGMT. DIST., ANNUAL RECLAIM AUDIT REPORT FOR THE 2000 COMPLIANCE YEAR G-20 (2002).

264. *See* SOUTH COAST AIR QUALITY MGMT. DIST., *Regulation XX: Regional Clean Air Incentives Market, Rule 2009.1 – Compliance Plans and Forecast Reports for Non-Power Producing Facilities* 2009.1-4 (2001), *available at* http://www.aqmd.gov/rules/reg/reg20/r2009-1.pdf.

265. *See id.*

stakeholder that was interviewed regarding the success of the program, "as a result [of low allowance prices and RECLAIM market uncertainty], companies did not make a conscious effort to conduct long-term planning regarding RECLAIM. Many companies believed they would always be able to purchase credits."[266] With regard to small and medium sized companies, another industry stakeholder stated that "[m]ost small and medium size companies do not plan for the long term, they are more concerned about selling products and making money. These companies do not have the resources to look at long-term capital needs."[267]

The requirement that compliance plans be written and approved by the regulatory agency furthers the goal of greater information exchange between agencies and regulated entities. Industry stakeholders interviewed about the RECLAIM program complained about the lack of information provided to them by the regulatory agency. As one industry stakeholder states "when [command and control] regulations were stopped, companies lost the CAC compass and so they did not know what equipment was available to be installed."[268] An industry stakeholder knowledgeable about small companies stated "smaller companies might benefit from more information about available types of control technologies. The District should ensure that information . . . is available to those companies that need it."[269]

A compliance plan rule such as Rule 2009 should be incorporated as a backup mechanism in a cap and trade program. In the case of mass regulatory failure, as experienced by RECLAIM in 2000 in part because of the energy crisis and in part because of the lack of program-induced emissions reductions, compliance plans implementing technology-based standards should be required of program participants.

Moreover, compliance plans as called for in Rule 2009.1 should be utilized to supplement cap and trade programs on a more regular basis. They might be required of all facilities as a basic requirement for participation. Alternatively, they may be required at the first instance of noncompliance. Interestingly, the EPA's 1992 comments on the RECLAIM program during its devel-

266. Interview by Ken Israels, EPA, with industry stakeholder (Jan. 4, 2002). These interview results were collected by the EPA for the research reported in AN EVALUATION OF SCAQMD's RECLAIM, *supra* note 3.

267. Interview by Ken Israels, EPA, with industry stakeholder (Jan. 4, 2002).

268. *Id.*

269. Interview by Ken Israels, EPA, with industry stakeholder (Dec. 10, 2001).

opment suggested that the District impose a compliance plan requirement at the first instance of noncompliance. As the EPA stated, "[w]e believe that facility owners should be required to develop enforceable compliance plans as a remedial measure in those cases where a facility has exceeded its emission cap for a given averaging period."[270] The EPA then defined "compliance plan" as a comprehensive statement of how the facility would be operated to ensure compliance with its emissions cap, including "appropriate schedules for implementing additional emissions control equipment or other procedures" to bring the facility into compliance.[271] The EPA's 1992 recommendation, however, was not incorporated into the RECLAIM program design.

At least two concerns might be raised about greater use of compliance plans in cap and trade programs. The first is that it will erode the efficiency gains possible through cap and trade. Compliance plans might mandate or influence facilities to reduce emissions in ways that are not the most cost effective. Moreover, the process of negotiating and bargaining involved in the generation of compliance plans itself may introduce inefficiencies.[272] As pointed out by one commentator, the institution of compliance plans in RECLAIM is significant because "cost savings in [cap and trade] systems come from the ability to innovate in compliance strategy, not from buying or selling allowances."[273]

In addition, the use of compliance plans within cap and trade programs would increase the costs faced by a regulatory agency in administering the program. Cap and trade programs have been heralded for their potential to reduce administrative costs.[274] In the Acid Rain Program, relatively few agency officials are needed to run the program, and the majority of their time is spent on the measurement, verification, and tracking of emissions data, tasks which are increasingly routinized and computerized.[275] The administrative cost savings has not been as clear in RECLAIM. In its 2002 evaluation of the RECLAIM program, the EPA states that the actual costs of administering RECLAIM have exceeded

270. Letter from Office of Air & Radiation, EPA, to James M. Lents, Ph.D., Executive Officer, South Coast Air Quality Mgmt. Dist. 10 (Feb. 28, 1992), *available at* EPA, Guidance Concerning Stationary Source Requirements under RECLAIM, *available* at http://www.epa.gov/ttn/nsr/gen/pdf/memo-e.pdf.

271. *Id.*

272. *See* Kruger, McLean & Chen, *supra* note 107, at 115-17.

273. Burtraw et al., *Lessons for a Cap-and-Trade Program*, *supra* note 239, at 5-30.

274. *See, e.g.*, Burtraw & Swift, *supra* note 1, at 10,412, 10,414-18.

275. Kruger, *Companies and Regulators*, *supra* note 63, at 10.

the estimated 5% of SCAQMD's budget and have been "far more resource intensive than [command and control] regulations."[276] The evaluation cites the costs of retraining inspectors to do RECLAIM inspections, the complexity and lengthiness of such inspections, and problems in the automation of information systems.[277] In addition to the costs of administering a cap and trade program, the use of compliance plans implies that regulatory agencies again incur some of the same costs involved in traditional regulation. These include the costs of assessing control technology options, communicating this information to facilities, and negotiating with facilities regarding the acceptability of their compliance plans.

V. CONCLUSION

The term compliance has a very different meaning and significance in traditional regulation than in cap and trade regulation. In cap and trade, compliance is no longer a judgment call by regulators related to facility-specific environmental performance. It is disassociated from the physical processes of pollution control. Under traditional regulation, being out of compliance meant you were polluting more than the average facility of your type. In cap and trade programs, it may simply mean that you didn't buy enough credits to cover your pollution.

In cap and trade, compliance tells you that facilities are participating in the program and holding enough allowances to cover their emissions. In the two major cap and trade programs considered in this article, compliance has been an artifact of program design in most years. If the cap is generous enough, as it was in the RECLAIM program, all facilities may be in compliance for several years without reducing their emissions at all. Also if the penalty for excess emissions is higher than the price of credits on the open market, then a facility would have to be economically irrational to not comply.

Compliance of a particular facility in cap and trade does not tell you whether facilities have reduced their emissions. Also, compliance of all facilities in a cap and trade program doesn't necessarily say anything about whether emissions were reduced to the extent feasible or to the socially optimal level. One-hundred percent compliance means that facilities participated in the pro-

276. AN EVALUATION OF SCAQMD's RECLAIM, *supra* note 3, at 30.
277. *Id.* at 31.

gram and held enough allowances to cover their reported emissions. In sum, compliance rates in cap and trade communicate less than in rate-based regulation.

In evaluating the success of a cap and trade program, one must look at measures other than compliance rates. As theory is put into practice in implementing cap and trade programs, much attention needs to be placed on analyzing how well programs really work and why. An important question concerns how policy instruments from traditional regulation and cap and trade regulation might work together. Several commentators have found the existence of remnants of traditional regulation to be responsible for difficulties or failures in cap and trade programs.[278]

This article argues that compliance plans, a common element in traditional regulation, may remain useful in a cap and trade context. Compliance plans involve regulators in compliance decisions in a more extensive way than is called for in the theoretical renditions of cap and trade. The RECLAIM program, which must be considered to be the most important cap and trade program yet implemented alongside the Acid Rain Program, shows that compliance plans may be not just useful, but also necessary to program success.

278. *See, e.g.*, R.F. Kosobud, H.H. Stokes, C.D. Tallarico & B.L. Scott, *The Chicago VOC Trading System: The Consequences of Market Design for Performance* (Ctr. for Energy & Envtl. Pol'y Res., Working Paper No. 04-019, 2004), *available at* http://web.mit.edu/ceepr/www/2004-019.pdf.