ABSTRACT

THE RISE AND FALL OF OPEN MARKET EMISSIONS TRADING IN NEW JERSEY

by
Devin Peter DeMarco

On August 2, 1996, the New Jersey Department of Environmental Protection (NJDEP) promulgated rules governing its Open Market Emissions Trading (OMET) program. With a goal to provide industry with a greater degree of flexibility in meeting federal air compliance directives and simultaneously move the state towards the attainment of National Ambient Air Quality Standards (NAAQS), this program is now slated for termination following scrutiny from the federal Environmental Protection Agency (EPA), environmental groups and a new NJDEP administration.

This thesis discusses the basis for this scrutiny and other program flaws discovered through interviews with, and public comments from, NJDEP and EPA officials, industry representatives, environmental advocates and former members of the New Jersey State Legislature. The results of this work are also placed against the political background that gave rise to open market trading in New Jersey, and may have hindered the program's success.

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by
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This thesis is dedicated to my supportive family

and my loving wife, Karen

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LIST OF NOMENCLATURE

AEL	Alternative Emissions Limit
APCA	Air Pollution Control Act
BACT	Best Achievable Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CEM	Continuous Emissions Monitoring
CO	Carbon Monoxide
DER	Discrete Emission Reduction
DERTP	Discrete Emission Reduction Trading Program
EIP	Economic Incentive Plan
ERC	Emission Reduction Credit
ERCTP	Emission Reduction Credit Trading Program
EPA	Environmental Protection Agency
HAP	Hazardous Air Pollutant
IG	Inspector General
ISC	Interstate Sanitary Commission
LAER	Lowest Achievable Emission Reduction
MAC	Marginal Abatement Cost
MACT	Maximum Achievable Control Technology
MARAMA	Mid-Atlantic Regional Air Management Association
MEC	Marginal External Cost
MOU	Memorandum of Understanding

LIST OF NOMENCLATURE
(Continued)

NAAQS	National Ambient Air Quality Standards
NESCAUM	Northeast States for Coordinated Air Use Management
NGO	Non-Governmental Organization
NJDEP	New Jersey Department of Environmental Protection
NO_X	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
NRDC	Natural Resource Defense Council
NSPS	New Source Performance Standards
NSR	New Source Review
OMT	Open Market Trading
OMET	Open Market Emissions Trading
OMNYMAP	Oxidant Modeling for the New York Metropolitan Area Project
OMTR	Open Market Trading Rule
OTAG	Ozone Transport Assessment Group
OTR	Ozone Transport Region
Pb	Lead
PEER	Public Employees for Environmental Responsibility
PSD	Prevention of Significant Deterioration
RACT	Reasonable Available Control Technology
RECLAIM	Regional Clean Air Quality Management District
ROM	Regional Oxidant Modeling
SIP	State Implementation Plan

LIST OF NOMENCLATURE
(Continued)

SO_2	Sulfur Dioxide
VOC	Volatile Organic Compound

CHAPTER 1

INTRODUCTION

1.1 Objective

Open Market Trading (OMT) is one of the most recent types of marketable credit trading systems that attempts to link economic efficiency and cleaner air. Adding to the list of market tools already in use, OMT can replace or complement common forms of air quality regulation such as standards, taxes, and subsidies, and substitute for resource-intensive, tradable permit systems such as cap-and-trade. Market measures created prior to OMT have paved the way for its use, providing theoretical and economic advantages such as "cost minimization" and the avoidance of "technological lock-in" (Pearce and Turner, 1990).

As one of the few states to implement OMT in the United States since its initial theoretical publication in 1994 (see Ayres, 1994), New Jersey's Open Market Emissions Trading (OMET) program provides a rare chance to evaluate open trading as an effective regulatory tool for other state and federal officials contemplating the use of market measures in environmental policies. Placing a focus on the New Jersey program is further warranted following the decision by the New Jersey Department of Environmental Protection (NJDEP) on September 18, 2002 to terminate the state's open trading program as a result of it being "an experiment that failed" (Mansnerus, 2002).

This thesis seeks to clarify whether the termination of New Jersey's OMET program is indicative of any systemic flaws inherent to the theory of open trading or rather a failure to properly transition open trading from concept to application within the

state. As a result, this thesis will highlight the problems and obstacles that New Jersey's program faced by conveying feedback received from interviews with officials inside and outside of NJDEP, much of which has not been made public. A focus will be placed on the management, perception, and political challenges confronting New Jersey's open trading initiative, rather than the economic influences, because of the relatively small amount of credit trading that occurred and the controversy surrounding the program at both its inception and announcement to be terminated.

1.2 Background Information

Introduced by J. H. Dales in 1968, marketable permit systems are commonly divided into two different types -- credit programs and cap-and-trade systems (Maler and Vincent, 2003). Cap-and-trade systems are characterized by a maximum level or "cap" on overall emissions in a trading area, and are routinely employed to control pollution types common to industry such as nitrogen dioxide (NO_2) and sulfur dioxide (SO_2). To accomplish this, individual companies regulated by cap-and-trade programs receive pollution permits (also known as "allowances") for aggregate emissions, the sum of which must equal the program cap.

Conversely, credit systems operate by trading emission reduction credits (ERCs or credits) either within or between individual facilities, and have been used to improve air quality on a more localized scale vis-à-vis the regional or national approach of cap-and-trade systems. The reduction of emissions to levels below those required by regulatory permits allows companies to generate credits. Those reductions (credits) can be used (cashed-in) by the same company in the future to compensate for emission levels

above those required by air pollution permits. The credits can also be traded (sold) to another company seeking to comply with pollution control requirements. Such transactions take place through regulatory avenues such as *netting* or *bubbles*, *banking* and *offsets*.

Netting, or *bubble* policies, share common goals and are best thought of as establishing an imaginary "glass dome" covering individual sources (e.g., stacks, storage tanks) of pollution confined to a single facility. Those installations can also be spread out across several different, individually-owned plants.[1] As such, only total emissions of each pollutant that leave the bubble are regulated, instead of specific emissions limits being applied to individual sources (Pearce and Turner, 1990). Companies can use netting and bubble concepts to trade ERCs between sources as long as combined emissions do not exceed the aggregate limit (Tietenberg 1985; Hahn 1989; Foster and Hahn 1995). The 1977 Clean Air Act (CAA) authorized a limited type of such trading, with the result that bubbles became progressively more popular through the mid-1980s, with the Environmental Protection Agency's (EPA) approval of more than 50 bubbles and states enacting additional ones under EPA rules (Maler and Vincent, 2003). Consequently, firms could rearrange their emissions among an array of sources in line with the equimarginal principle (Pearce and Turner, 1990).[2]

The *offset* program, also beginning in 1977, expanded upon the bubble approach and injected greater flexibility into the CAA objectives by allowing companies a wider range of choices with which to satisfy their legal pollution control responsibilities (Stavins, 2000). Applied in regions not in compliance with National Ambient Air Quality Standards (NAAQS) (also known as non-attainment areas), companies with new or

expanding sources of air pollution were required to purchase ERCs from existing sources to "off-set" new emissions of the same pollutant in that area. In this way, new industry is allowed to enter areas not in compliance with NAAQS, avoiding the loss of income and employment that might otherwise occur. In addition, companies that already exist in an area can use revenue from ERC sales to finance pollution control technologies and reduce their emissions below baseline levels.

Offset transactions can occur between sources within the same firm or among different firms. However, a company must use pollution-control technologies that comply with the Lowest Achievable Emissions Reduction (LAER) rate to qualify as a buyer. Offset trading can be structured by regulatory agencies to ensure overall emissions remain the same by trading at a one-to-one ratio, or a "ratchet down" approach can be pursued that requires buyers to purchase more than one offset per unit of added emissions (Field, 1997).

Emissions banking, authorized in 1979, is another mechanism that industry uses to its financial benefit by allowing industries to generate credits that can be used at a later date in the offset, bubble, or netting programs or sold to other parties seeking compliance with air pollution limits (Stavins, 2000). Under federal law, each state must develop a system in which credits can be banked and must establish procedures to provide oversight of credit transfers between buyers and sellers.

The flexibility inherent in marketable permit systems provides certain advantages when compared to more traditional approaches to regulation. The chance to trade credits or allowances in marketable systems can reduce the costs of air pollution control requirements to levels below those of pollution standards or taxes. By utilizing so-called

marginal abatement cost (MAC) as a demand curve for permits, firms with lower abatement costs find it simpler to reduce pollution than to buy permits, while firms with a relatively high MAC have a greater incentive to purchase permits. That situation leads to an immediate market for allowances and reduces the total cost of pollution abatement. Additionally, trustees (state and federal government) have the power to control overall emissions and to motivate firms to invest in pollution control technologies as permit prices rise with higher demand, creating the opportunity to sell allowances and offset pollution reduction expenditures (Pearce and Turner, 1990).

Conversely, standard-setting is prone to economic inefficiency and therefore unlikely to secure the optimal level of externality. Pearce and Turner (1990) support that position demonstrating that penalties in standards-based regulations tend to be too small to create optimal levels of net private and social benefits. As a result, standards give businesses the incentive to increase economic activity exceeding pollution limits. Standards-setting also draws criticism for the level of resources required to monitor source activity and for its failure to provide little, if any, incentive to achieve further reductions of non-product output.

Emission taxes provide a greater ability to reach environmental goals by requiring the polluter to pay a tax even on the optimal amount of pollution and providing an incentive to reduce emissions further. With taxes, firms essentially pay for the services of the environment just as they pay for other inputs to their operation -- costs they are motivated to minimize to improve overall profitability. However, the primary problem with tax-based systems is the need to establish MAC and Marginal External Cost (MEC) (Field, 1997). Commercial confidentiality routinely obstructs calculating MAC and MEC

accurately, leaving the government in a poor position to utilize tax strategies efficiently (Pearce and Turner, 1990).

The ability of marketable pollution permit systems to side-step such problems in pollution tax strategies and to overcome limitations of technical standards add to the reasons that trading programs are becoming increasingly popular in state-level air pollution control plans (Ayres, 1994). However, those advantages did not secure an immediate place for market-based approaches in air pollution following their approval in 1977.

Cook (1988) highlights the early challenges EPA faced when transitioning market-based concepts into practice. The majority of issues that prevented the application of marketable permit systems involved the legal and technical challenges EPA encountered before trading could be put into practice. Program application was plagued by large gaps in actual emissions inventories, inefficiencies in engineering requirements that treated similar industrial processes alike, and confusion about the relationship between emissions and air quality. Those problems discouraged emission trading from being seen as a practicable method of regulation when deficient emissions inventories could not confidently assure the attainment of technical standards. Subsequently, critics focused on the opportunity that marketable permit systems gave industry to take advantage of an immature air quality management system.

Establishing emissions baselines before companies could trade credits also became a formidable task. Setting a baseline to comply with a technical standard such as reasonably available control technology (RACT), or assigning site-specific levels,

sparked debate over whether to use "allowable" emissions levels (technical standards) or "actual" levels (defined by historic emissions) (Cook, 1988).

Another problem related to how much independence states had under the CAA to develop, revise, and carry out State Implementations Plans (SIP) showing how they would comply with NAAQS. That autonomy was critical to implementation, as extensive federal oversight and intervention would impede the ability of localized trading programs to rely on decentralized decision-making (Cook, 1988).

However, the main problem with market-based systems concerned the big picture of emissions trading and its relation to existing policy -- the fundamental change of approach to regulating air pollution. Federal officials were concerned with the transition from a regulatory style rooted in command-and-control thinking to one further complicated by a new incentive framework and whether or not it could be administered effectively. Aside from the policy decision either to graft emissions trading onto the existing regulatory structure or to make a more fundamental change to domestic air control policy, significant government resources were needed to establish new accounting procedures, retrain pollution control staff to administer them, and to create a new generation of pollution control accountants. The need for cooperation at the federal level and to obtain "buy-in" from the numerous players in the environmental arena complicated that task. Most were comfortable with command-and-control with many of them vested heavily in the then-current system of direct regulation. A change in approach at all levels was critical to ensure that the flexibility, efficiency, and technological innovation associated with trading could be realized (Cook, 1988).

Despite those early obstacles, credit trading systems during the 1970s afforded significant aggregate cost savings in the early years. However, those schemes were predicated almost entirely on internal trading activity while offering little or no net change in emissions levels. The scarcity of trading among different firms did not allow the full potential cost savings to emerge, and those few early trades fell subject to lapses in enforcement oversight (Hahn, 1989). The breakdown of early emissions trading systems has been further noted by many observers (Foster and Hahn, 1995; Hahn and Axtell, 1995; Hahn and Hester, 1989).

Hahn (1989) attributes the early setbacks of trading to a struggle over property rights and the awkward task of providing industry with greater control over emission levels. Giving industry a "right" to pollute had to be accomplished without granting business unreasonable control over their existing levels of pollution, while tending to the needs of environmental groups. Ultimately, the divergent interests of those two groups led regulators to settle on policies designed to de-emphasize the exact nature of emission credits and to inflate the cost of external trading. That move prompted many firms to avoid external trading in favor of internal trading or to abandon the concept altogether.

Inter-facility credit transactions became more popular in the 1980s as states solidified credit transfer systems and, in 1986, EPA established an Emissions Trading Program. While participation in the programs was optional for both industry and states, trading levels supported by optimistic firms created a respectable market in light of uncertainties in program direction (as cited in Maler and Vincent, 2003). Three major program types evolved from such trading: credit systems using ERCs, cap-and-trade, and

OMT. Because EPA did not release its proposed rule for OMT until 1995, early trading models came to be classified as ERCs or cap-and-trade programs.

Two examples of popular programs are the lead-trading initiative for gasoline refiners and the heavy-duty motor vehicle engine emissions trading system. Both ERC programs, the lead program successfully provided greater flexibility in meeting emission standards during the same period the lead content of gasoline was reduced. However, there are indications that this program may have produced temporary geographic shifts in credit use patterns (Anderson, Hofman and Rusin, 1990). The heavy-duty motor trading system allowed the use of averaging, banking, and trading of credits for NO_x and particulate emissions among truck and bus engine manufacturers. That program has since been used to create incentive mechanisms for agricultural and construction equipment, locomotive engines and certain classes of marine engines (Maler and Vincent, 2003).

Congress took advantage of those early market successes by establishing Title IV's acid deposition program, which allows for the most extensive use of incentive-based pollution control measures under federal law. Established under the CAA of 1990, a nationwide cap on sulfur and nitrogen dioxide emissions provides a timetable for annual emission reductions. Fossil fuel-fired electric power plants must reduce 10 million tons of SO_2 emissions each year and 2 million tons of NO_x emissions each year from 1980 levels. That two-phase plan promotes emissions trading and banking by allocating pollution allowances to utilities based on past emission and fuel consumption levels.[3] Allowances permit credit holders to emit one ton of SO_2 during or after the calendar year of issuance and may be transferred within a company for use on multiple units or passed on to another owner (Percival, Miller, Schroeder and Leapre, 2000).

In California, successful implementation of the Title IV program is complemented by the Regional Clean Air Incentive Market (RECLAIM) program for smog control managed by the South Coast Air Quality Management District. Aiming to reduce oxides of nitrogen (NO_x) and SO_2 emissions in a four-county area, Anderson (1997) predicts a 42 percent cost savings totaling $58 million annually. As of 1996, more than 350 participants traded more than 100,000 tons of NO_x and SO_2 emissions valued at more than $10 million dollars (Brotzman, 1996).

The zonal nature of the RECLAIM program disallows trades from downwind to upwind sources and depicts how trading programs can be modified to account for local atmospheric characteristics. As cap-and-trade models, both RECLAIM and the acid rain program overcome two inherent flaws in ERC trading models: the loss of a source's ability to increase actual emissions to permitted levels during ERC generation and inconsistencies when calculating emission baselines (Solomon and Gorman, 1998).

While the details of both programs are extraordinarily complex, the success of RECLAIM and the acid rain program strengthens economists' contention that tradable permits should be used in place of command-and-control approaches when it is feasible to do so. Additionally, the achievements of both programs have helped to overshadow critics of initial emissions trading programs who pointed to awkward implementations and small rates of success (Loeb, 1990; Foster and Hahn, 1995; Hahn, 1989; Liroff, 1986).

The Title IV program achieved its Phase I emissions goal for SO_2 by the target date without extensive litigation and at a lower cost than initially projected -- a wider range accomplishment that few command-and-control regulations can match (Stavins,

2000). As a result, there is growing interest in the use of economic incentives for air pollution control, with many state and regional programs already in place. Michigan and Illinois both supplement existing air quality programs with market incentives for ozone compliance. Twelve northeastern states (and the District of Columbia) employ a regional NO_x cap-and-trade system known as the Northeast Ozone Transport Region (OTR) under EPA guidance.[4] Many states within this region, including New Jersey, have in-state NO_X trading programs to link with the regional system and to facilitate compliance with statewide caps.

Starting in 1999, OTR was created as a regional program for reducing NO_x emissions from major sources to facilitate compliance with ozone NAAQS. The program consists of a region-wide NO_x cap for sources and offers a more flexible and cost-effective means to comply with pollution standards. EPA is responsible for distributing NO_x allowances to each state. In turn, states distribute emission allowances to sources within their territories in accordance with their restricted percentage of 1990 emissions.[5] The program is only operational during the ozone season (May 1 through September 30) when NO_x reductions are most important (New Jersey Department of Environmental Protection [NJDEP], 2003).[6]

While Farrell *et al.* (1999) compared traditional compliance costs and OTR incentives to find cost savings ranging from 40 to 47 percent from 1999 to 2003, this study also identified program obstacles. For example, existing command-and-control regulations on many sources and the seasonal nature of ozone formation may complicate emissions trading. Moreover, they assert that the potential for credit transfers from downwind to upwind sources runs counter to the program's intent.

Additional barriers with cap-and-trade programs recognized by the federal government include the holistic problems with emission budget programs. Budget programs require considerable start-up time and effort as agreement must be reached on the program scope, the baseline emissions levels, the emissions caps and the rates of decline, the allotment of emissions allowances, and the monitoring and measurement techniques to be used. As a result, program implementation can take several years, as was the case with California's RECLAIM and the federal acid rain program. From those experiences, an incentive was created to streamline emission-trading programs and to reduce upfront challenges in initiating budget programs (US Environmental Protection Agency [EPA], 1995). As OMT's policy platform addressed those concerns, open trading quickly gained approval from high-level federal environmental officials to take market-based tools in another direction.

The remainder of this thesis focuses solely on OMT. Chapter 2 further discusses the theoretical characteristics of OMT and the political events that strengthened the program's adoption at both the federal and state levels. Chapter 3 reviews the specific transition of OMT to the state level and the OMT programs evident today. The next two chapters concentrate on New Jersey alone and are based on Freedom of Information Act Requests and interviews with NJDEP, EPA, industry, and legislative officials. The identities of the respondents are not disclosed to prevent retribution. Chapter 4 focuses on the history of air pollution management in the state leading up to the process by which OMT was incorporated into state law. This is followed by a discussion in Chapter 5 on the reasons why the New Jersey program failed and also points out suggestions for existing and future OMT programs.

CHAPTER 2

THE CREATION OF OPEN MARKET TRADING

2.1 Re-thinking Market-Based Regulation

EPA issued a proposed Open Market Trading Rule (OMTR) on August 3, 1995 that was largely based on the outcome of a demonstration project organized by the Northeast States for Coordinated Air Use Management (NESCAUM) and sponsored by the Mid-Atlantic Regional Air Management Association (MARAMA) that focused on creating ways to reduce tropospheric ozone levels in the northeastern United States. As a result, the rule proposed for "all types of sources to trade emissions of pollutants that cause ground-level ozone [to] significantly reduce the overall cost of meeting the public health and environmental goals of the national ambient air quality standards for ozone" (EPA, 1995). Furthermore, with "the potential to reach market-based opportunities that emissions budgets are not capturing, and to serve in some cases as a transitional stage until full emissions budget programs can be developed," OMT's concept and execution differed from traditional emissions credit programs such as bubbles, netting, and offsets (EPA, 1995).

Instead of trading reductions that offset same-time emission rates for indefinite periods of time (Emission Reduction Credits), OMT programs traded Discrete Emissions Reductions (DER) credits between facilities. That modification would allow firms to sell temporary emissions reductions below their permitted levels to other facilities seeking to satisfy temporary or permanent excesses in allowable emission levels. Additionally, the OMTR credits could be exchanged among various types of pollution sources, and in

some cases, could be traded among different emissions categories, such as NO_X for SO_2 through inter-pollutant trading (EPA, 1995).

Another theoretical change was OMT's promotion of an open market. In comparison to trading programs that operated under an emissions ceiling, there was no proposed limit on how many credits could be available for purchase. Companies could have a virtually unlimited credit-generating potential once abatement capacities brought emissions below baseline levels and a greater capacity to finance control costs if demand for credits turned out to be sufficient to meet supply. Consequently, the proposal required that credits generated for purchase had be the result of a temporary or permanent reduction in emissions that were real and measurable.

Likewise, OMT could provide firms with access to a potentially unlimited supply of credits. Firms could use DER credits to permanently satisfy certain technical standards requiring emissions reduction such as RACT (EPA, 1995). However, DER's could not be used to avoid penalties or enforcement actions through purchases made after non-compliance events, for netting out of or evading New Source Review (NSR)/Prevention of Significant Deterioration (PSD) requirements, as stimulated under Section 111 and 129 New Source Performance Standards (NSPS), to meet Best Available Control Technology (BACT) or Maximum Available Control (MACT) requirements, or to comply with employer trip reduction programs.

To ensure a long-term environmental benefit under the new provisions, EPA proposed that open market programs should encourage early reductions of emissions through banking, as well as incentives for innovative and incremental emissions reductions. An emphasis was placed on establishing and using approved emissions

quantification protocols. Those protocols were critical as they served to determine how many credits companies were eligible to receive after additional controls for emissions were in place. Also, reductions to meet technical standards could not qualify as measures leading to DER generation.

Additional measures pursued to ensure an environmental benefit under OMT included a proposed condition that ten percent of every credit used would be retired. Without this condition, firms could essentially trade DERs with no change in overall emissions, with some firms reducing emissions below allowable levels, and some consistently polluting above them. Credit retirement was required by EPA for any state seeking to utilize OMT, the level of which was thought to be justified based on an industry's ability to reduce costs significantly, and the need to minimize the effects of emissions spiking. That justification fell in line with the final Economic Incentive Program (EIP) rules published in 1994, which required any incentive plan to benefit both the environment and the regulated community.

Open market trading also aimed to improve credit quality by refocusing on a critical question of successful trading programs: what measures are needed to ensure that credits generated are the result of real emissions reductions? Instead of credits being reviewed and authorized by government officials, EPA proposed to issue guidance for emissions quantification protocols that firms could use to estimate their own reductions and use. Quantification methods to measure reductions and the amount of credits needed by firms to meet compliance would be required to meet any guidance EPA issued. Additionally, EPA intended to create mechanisms to approve quantification protocols for common generation and use activities drafted by industries, internal officials, or states.

However, given the amount of effort needed to approve specific protocols for the myriad of applications overseeing pollution control, and the conflict such efforts would have with the original intent to speed up trading programs, OMT shifted credit certification to the back-end of the trading process instead of up-front. That moved the responsibility of quality control into the hands of companies, as users were expected to select credits only after careful inspection to protect themselves, and to use private-sector resources to replace auditing functions typically performed by government officials prior to credits even becoming available for purchase (EPA, 1995).

Allowing the private market to advance quality standards contradicted previous policy statements issued by EPA, such as the 1986 Emissions Trading Statement and the 1994 policy on Economic Incentives Programs. The first statement required heavy investment of state, federal, and public resources in up-front oversight of credit trades to avoid habitual quality problems. In contrast, OMT programs could begin without waiting for agreement on pre-established emission quantification procedures, an overall emissions cap, or the number of emission allowances for each firm. The OMT proposal also enabled states to outsource trading management similar to the way business outsources critical functions of daily operations. Outsourcing could even include credit certification. Additionally, the scope of participants allowed to take part in OMT expanded to include both major and minor sources, some of which had not previously encountered credit trading as an environmental management tool.

2.2 Political Positioning

Starting in 1993, the NESCAUM/MARAMA project provided guidance on OMT following a pilot study involving industry, environmentalists, and air quality regulators. OMT claimed to reduce compliance costs and to increase emissions reduction activities while improving existing air emissions trading programs and policies by implementing actual credit creation and credit use strategies. An enormous event, the project involved more than 25 corporations and trade associations, five environmental organizations, and thirteen state and federal representatives from environmental and energy agencies. The executive summary claims that the project achieved the following:

> -- Over 14,000 tons of voluntary NO_X reductions and 350 tons of voluntary volatile organic compound (VOC) reductions during the ozone season, with an additional 4,000 tons of voluntary NO_X reductions outside of the ozone season;
>
> -- Reviewed eight trades of these voluntary emissions reductions -- three of which were interstate trades -- for use in complying with state and federal air quality requirements;
>
> -- Demonstrated that a market for emissions reductions exists, and through the market, discovered that the cost of making reductions in the northeastern United States can be as little as $750 to $1000 a ton for NO_X and $2000 a ton for VOC's;
>
> -- Developed 43 replicable methodologies involving the creation, use and transfer of discrete emissions reductions;
>
> -- Participated in the development of a working registry that provides online information about the quantity and quality of the DERs generated during the project (Northeast States for Coordinated Air Use Management [NESCAUM], 1995).

The success of the demonstration project and, specifically, the development of OMT was further promoted by Ayres (1994) as a program that avoided the structural and

procedural shortcomings of US air policies. That work by Ayres was very influential with the new Clinton/Gore administration, the extent of which materialized during the first weeks of 1995 when the Administration made two distinct decisions affecting the direction of air policy (Public Employees for Environmental Responsibility [PEER], 2000).

One directive entailed a deferral for at least two years of the required submissions of attainment plans for ozone (PEER, 2000). Another decision labeled OMT as a program "that can give industry more choices for compliance, produce substantial economic savings, achieve better environmental protection, and stimulate technological innovation in pollution control" (Nichols, 1995a; PEER, 2000). As a result of those claims, OMT was marketed by the federal government as a useful program and EPA pushed for its implementation at the state level in a letter dated January 23, 1995, from EPA Assistant Administrator Mary Nichols to all state air pollution control directors.

> In order to move forward to capture the benefits of both approaches [cap-and-trade and OMT] as rapidly as possible, my goal is to work quickly with States, industries, and environmentalists to resolve remaining issues and to create a simplified path by which States that want to adopt these approaches can do so (Nichols, 1995b).

Both of these directives placed an emphasis on market-based solutions and cost reductions for ozone attainment, shifting the focus in many states to the development of emissions trading programs instead of the establishment of action plans to meet air quality goals (PEER, 2000).

Federal environmental officials subsequently put measures in place to ensure OMT received a favorable reception by state officials and the Clinton Administration's

new air policy was at center stage. To quell concerns over the "time" and "transaction costs" to grant emissions trading capacities to various industries, EPA proposed a federal rule allowing for broad revisions to SIPs. In this way, any company could create, trade and use DERs without prior EPA approval. This approach countered the traditional process of pre-certifying emissions trading between individual facilities before transactions took place. Once the rule was adopted, states could expect an automatic approval for any SIP revision that incorporated the forthcoming OMTR in its entirety (Nichols, 1995b).

Following this chain of events, OMT was hailed as a much-needed move from public to private oversight in line with then-President Clinton and Vice-President Gore's initiatives for regulatory reinvention (Clinton and Gore, 1995). An OMTR to help achieve public health standards for ozone at a lower cost and quicker pace was at the top of a wish list announced on March 16, 1995, and this pronouncement signaled an intention to make good on a campaign promise to reduce the regulatory burden on industry.

Twenty-nine states also gained from the agenda to push OMT as they faced the daunting challenge of having to comply with the NAAQS ozone standard. With costly emissions reductions expected and a national SO_2 trading program acting as a precedent, states were counseled to consider emissions trading schemes as a viable option to comply with the ozone standard. This type of program would be most useful in places furthest from achieving attainment and, at the time, included the Lake Michigan states, Texas, Southern California, and the OTR (Tikalsky, Kramer and Patrick, 1995).

Farrell (2001) outlined a series of events in the background of air pollution management at the time that complemented executive lobbying efforts to promote open trading. The popularity of emissions trading in general was growing as the success of voluntary schemes such as the OTC NO_X Budget emerged through cooperative analysis and actions by member states of the OTC (in spite of much confusion and disagreement on how to implement the program).[7] Also, downwind states failed to submit SIP revisions required by November 1994 under the Clean Air Act Amendments (CAAA) because of the unpleasant picture painted by the expensive and widely unpopular emissions control programs needed to attain the ozone NAAQS.

At the same time, and creating a crisis in air pollution management according to environmental advocates, the election of a new anti-regulatory, anti-federal Republican Congressional majority in November 1994 ended the traditional approach of settling transboundary air pollution problems through federal lawsuits or EPA orders. That context gave states greater room to set their own directions in air policy.

With fear of retribution from a new Congress and the onus taken on by state environmental agencies to reconcile pollutant transport issues alone, legal tactics to reduce air pollution played second to consultative collaboration. As a result, EPA discretely reached an agreement with critical state and non-governmental organizations (NGOs) on what reductions were needed for ozone NAAQS compliance. To accomplish those reductions, the Ozone Transport Assessment Group (OTAG) was formed to create the NO_X SIP Call, a larger-scale version of the OTC NO_X budget trading program composed of 37 states (Farrell, 2001).[8]

The SIP Call process had some success, but did not produce the agreement or degree of buy-in seen with the OTC's 1994 Memorandum of Understanding (MOU) on NOx control (Keating and Farrell, 1999). OTAG failed to receive constructive support from downwind states facing statutory deadlines to reduce emissions because of the delay it granted expensive and unpopular emissions reductions upwind. The creation of that latitude revealed the need for additional mechanisms to deal with the emerging regionality of ozone. Debate also centered on which type of trading scheme to adopt (Farrell, 2001).

However, the critical blow to the initial success of the SIP Call was in the failure of upwind states to concede that any emissions reductions were necessary at all, despite joint studies and negotiation with downwind states that concluded otherwise. Those actions by upwind states robbed the incentive of the SIP Call to produce a formal regulatory structure and equivalent command-and-control policies for all participating states in order to level the playing field -- all vital elements to a regional trading scheme characterized by the OTC NO_X budget program. All of those circumstances made evident the difficulties in bringing about a much larger, regional trading scheme characterized by a collection of local, but diversified interests (Farrell, 2001).

The long and contested debate centering on the SIP Call delayed a larger market tool to deal effectively with the interstate air pollution problem in the northeast. As a result, OMT could be seen as a favorable option that states could pursue unilaterally to simultaneously reduce emissions and buffer the economic impact on businesses to do so. In addition, OMT would allow for credit trading to take place throughout the entire year instead of solely during the summer months.

Fortunately for states seeking to employ OMT, EPA finalized the proposed OMTR during the initial disagreements over the NO_X SIP Call with the intent to issue a final rule following public comment. This action paved the way for states seeking to incorporate low-cost trading programs to meet compliance with ozone NAAQS, and, with EPA's commitment for quick approval of any state program reflecting the federal rule, adoption became much easier.

However, as discussed in the following chapter, a sequence of events and initial disagreement over the proposed OMTR would prevent EPA from ever finalizing a federal OMT rule. In fact, only in 2001 would EPA issue formal guidance on the program, well after the implementation of OMT at the state level, leaving room for program variation.

CHAPTER 3

HAND-OFF TO THE STATES

3.1 Stumbling Out of the Gate

The development of the OMTR involved a collaborative effort from EPA, industry officials, environmentalists, state officials, and emissions trading experts. As a result, the OMTR was, for the most part, initially acknowledged by industry officials and environmentalists as a worthwhile program when it was published in August of 1995. However, many states quickly dissented during the rule's comment period over the restrictions the OMTR placed on "unique emissions trading needs" and, as a result, would not pursue OMT programs (EPA, 2002). To keep states interested in OMT, EPA instead aimed to issue the OMTR rule as guidance with the intent to maintain some consistency among state-level programs (Utility Environment Report [UER], 1996). But a "host of unresolved issues" and significant opposition from NGOs delayed the issuance of OMT's final guidance (UER, 1998), most of which centered on credit verification and use procedures (Lobsenz, 1995).

Environmentalists very familiar with, and normally supportive of, emissions trading criticized the program for being unclear and without direction (Goffman and Dudek, 1995). Permitting companies to use an unlimited number of credits instead of complying with specific emissions allowances was conceived as a "loophole" that allowed companies to maintain a higher emission level indefinitely and forego compliance with federally mandated standards like RACT. Additionally, the absence of established program goals within the OMTR left activists longing for trading

programs characterized by specific emission reduction plans like cap-and-trade systems (Environmental News Service, 2001).

The types of sources eligible to take part in OMT differed in concept with traditional trading schemes, leading to additional concerns by NGOs. OMT allowed companies to participate in emissions trading regardless of their operation type and status under Title V. Opponents of this approach cited concerns with trading credits between fundamentally different source types with incompatible pollution profiles, pollution tracking ability, market incentives, resources, and sophistication (Hawkins, 2001). Although an increase in the number of companies that were trading credits could serve a stronger market, EPA failed to impose any absolute restrictions on the distance and directionality of DER trades in the 1995 rule to compensate for a more diverse trading topography. EPA also acknowledged that, in special cases, NO_X trades within a modeling domain could result in higher NO_X emissions in an urbanized area, and might increase already-high ozone levels in that area as well (EPA, 1995).

Further apprehension flowed from OMT's disregard for previous policies on emissions trading (1986 Emissions Trading Statement and the 1994 policy on Economic Incentives Programs) and lessons learned from the acid rain trading program (Hawkins, 2001). Instead of an emissions cap, OMT did not limit overall emissions allowances or increases at the source level. Opponents argued that the lack of limits would inevitably lead to an increase in air pollution levels and undermine public health and the environment (Environment News Service, 2001). Additionally, instead of requirements to use continuous emissions monitoring (CEM) to assist accurate quantification of

emissions, EPA expected itself, states, and industry to generate a number of protocols to quantify emissions from individual operations not using CEM (Hawkins, 2001).

The Natural Resource Defense Council (NRDC) claimed a 10 percent credit retirement was inadequate to ensure that an environmental benefit would occur once OMT was in operation and lobbied for a "discount schedule." Under the discount process, the retirement percentage upon credit use would increase over time, possibly at 5 percent each year (Utility Environment Report, 1995a).

As an author of the theory behind OMT, NESCAUM was also uneasy with the 1995 rule proposal because of its experience under the emissions trading demonstration project. NESCAUM called for additional safeguards against increased hazardous air pollutant (HAP) emissions from trading VOCs under the proposal and for assurances that enough trading information would be available to determine if trades posed harm to citizens living near a facility using credits. Consequently, NESCAUM urged EPA to direct sources to conduct hazard screening impact analyses to review threats to public health from increased HAP levels as a result of VOC trades (UER, 1995a).

Industry welcomed the increase in emissions trading potential that OMT provided, but feared OMT could jeopardize the integrity of emissions trading as a whole. Several industry officials of large utility and oil and gas companies denounced the large compliance risk the draft rule placed on business. In the proposed rule, credit purchasers were delegated the responsibility to verify the validity of any credit used for compliance purposes. As described in the rule, delegating to industry the responsibility to validate credits was promoted as a means to ensure credit quality, as companies seeking credits would be diligent and purchase only those credits subjected to measures confirming their

legitimacy (e.g., audits). If buyers were not diligent, and credits were later found to be invalid, regulators retained the right to confiscate the credits, leaving the buyer liable for any non-compliance. Fear of credit confiscation, according to industry advocates, would deter companies from relying on emission trading in the future (Lobsenz, 1995).

Furthermore, and of greatest interest, concerns with the 1995 OMTR were not confined to private and social interest groups. According to one of my respondents, the sudden changes in federal emissions trading policies prevented EPA from coming to universal agreement on the effectiveness and environmental benefit resulting from OMT and its place among existing air policies. In addition, fitting the new approach to trading credits into the existing requirements of the CAA became a formidable obstacle.

Section 110 (I) of the CAA prohibits EPA from approving any SIP revision that prevents a region from achieving air quality standards. With little or no direction in the OMTR outlining measures to reduce adverse impacts to local areas, it remained unclear whether EPA would impose any absolute restrictions on the distance or directionality of DER trades. The use of case-specific demonstrations through modeling or relying on individual states to certify that unrestricted uses of DERs would not result in emissions spikes were only offered as possible solutions. Also, EPA wrestled with whether to prohibit states that adopted OMT from issuing companies alternative emissions limits (AELs or variances) from emission standards in light of DER availability (UER, 1996).

Both NRDC and Public Employees for Environmental Responsibility (PEER) pointed out a "raging" debate within the Agency over the considerable enforcement and implementation flaws of OMT in large part from the opposition to the OMTR rule itself (Hawkins, 2001). That intra-agency debate was aggravated by a series of reports from

EPA's Inspector General (IG) issued between 1996 and 1998 that also served to stiffen environmentalists' resistance to open trading. Three of those reports related to OMT, with the third concerned specifically with the enforcement of air policies. Findings that resulted from those investigations paralleled the main concerns with OMT at the conclusion of the public comment period for the 1995 OMTR -- criticism on quantification protocols and general enforcement matters.

The March, 1996 IG report outlined the results of a special review that was part of the IG's comprehensive evaluation of the federal air program. The report noted concerns over the lack of emissions quantification protocols in the OMTR and the detrimental effects that the absence of protocols could pose to enforcement matters. Furthermore, the elimination of up-front certification of credits was noted as an invitation to "inadvertently allow the use of invalid credits," further complicating enforcement. Separate concerns posed by the IG followed limited testing of sampled Emission Credit applications which showed insufficient state approval documentation more than 84 percent of the time (EPA, 1996a).

In September 1996, the IG published another report that summarized the difficulty of using market-based programs like OMT in conjunction with the "need for [more] reliable emission factors." With so many more companies granted the privilege to trade credits under OMT, and the expenses associated with emissions monitoring equipment, there was greater reliance on emission factors, and that reliance magnified the need for them to be more accurate. EPA and the states would not be able to ensure that the effectiveness of emission trading programs like OMT were actually reducing emissions without establishing accurate emissions factors. Therefore, the "nation's air

quality could be adversely affected and persons could be subject to the health hazards associated with excessive exposure to airborne pollutants" (EPA, 1996b).

The September report also noted the difficulties with OMT's reliance on industry partnerships to establish emissions factors, the same approach EPA planned to seek to create quantification protocols for OMT. The IG was concerned with the financial benefit industries might pursue by developing inaccurate emission factors. Additionally, the ability of EPA to sustain sufficient control of the development of emission factors was thought to be critical to ensuring that any factors created were representative. The IG also commented on the diminishing resources EPA had available to supervise the creation of emission factors, a resource problem that could impact the OMT program (EPA, 1996b).

The next two IG reports published in 1998, while reviews of the overall problems with the federal air program and enforcement, detailed the responses, or lack thereof by federal officials, to the previous IG reports on problems related to OMT (EPA, 1998a and EPA, 1998b). In response to concerns over insufficient state documentation for emission credit applications and OMT's susceptibility to the use of invalid credits, the Director of the Office of Air Quality Planning and Standards, John Seitz, offered the following response to the IG:

> You raise several points in the body of your report and in the recommendations section concerning the appropriate policy direction . . . We appreciate you providing your point of view and will consider it . . . However . . . I remain committed to developing a model rule which minimizes the Federal government's involvement in the day-to-day operation of the market for these trades (As referenced in PEER, 2000).

Federal official's attempt to reconcile criticisms from the IG was generally inadequate, according to environmental advocates. In fact, EPA was not required to respond to the IG's criticisms as they were mere suggestions carrying no statutory obligation on behalf of EPA. The need for more accurate emission factors, which included a planned increase of two full-time staff members and a quadrupling in funding to $4.2 million within EPA, were not realized. Also, the IG found the improvement plan insufficient as particulates and toxics, not ozone precursors, were the focus of improved emission factors (Ruch and Wolfe, 2001).

Federal authorities did attempt to respond to one of the chief concerns not only of the IG, but also of all OMT critics -- vulnerability in emission quantification protocols. Protocols provided a "predictable road map" that allowed regulators, generators, and users to distinguish between high and low quality DER credits. Because of that, EPA intended to issue specific guidance after the OMTR that dictated the criteria that all quantification protocols had to meet. In addition, EPA intended to establish a mechanism for protocol approval of "priority types and generation and use activities" (EPA, 1995).

However, once again the Agency's response proved insufficient. As with its response to concerns over emissions factors, EPA said it believed that additional resources would help to strengthen the technical quality of quantification protocols. While EPA did provide additional resources in response to the IG's concerns in 1997, there was inadequate follow-up and the technical work required was never completed. Additionally, the Agency failed to issue the specific guidance to which all quantification protocols had to adhere in time for OMT's implementation at the state level (Ruch and Wolfe, 2001).

While emission factors and quantification protocols remained the prominent, specific concerns among a pool of criticism by various stakeholders, the larger problem was the ongoing delay by EPA in issuing guidance on the open trading programs that the states were already operating. The early decision to retain the OMTR as guidance not only granted flexibility to the states, but also delayed federal approval for state level programs like those in New Jersey and Michigan as each required individual review because of programmatic variations. Conversely, delay in federal approval enabled programs to operate under the sole discretion of state officials until federal review could occur. The next time EPA addressed OMT was in the 2001 Economic Incentive Plan guidance. This allowed, in New Jersey's case, five years to elapse between the program's commencement and the availability of a guidance document clarifying the unresolved issues of the 1995 OMTR.

Indeed, the IG concluded in 2002 that, because EPA issued non-binding guidance for OMT, the success of the program was hindered and important aspects of the guidance were ignored. That ignorance led to inconsistencies in the application of important safeguards to protect public health and an increased risk of invalid and questionable emissions trading (EPA, 2002).

Additionally, because neither the states nor EPA regional offices were required to follow the guidance, variation in other program areas became possible. The OMTR proposal contained many topics on which EPA sought comment -- including the possibility of allowing third parties to take on a portion of the regulatory liability of certain users, how states would address jurisdictional issues over out-of-state generators under a split-liability approach, responsibility for DERs generated in the past by sources

no longer in business, and the allowable lifetime of DER credits. Without formal, published guidance at the federal level to resolve those issues, each state that established OMT did so under a greater degree of flexibility than they could when addressing other regimented environmental laws.

3.2 Open Market Trading Programs in the United States

To date, patterns of OMT adoption remains consistent with Tikalsky, Kramer and Patrick (1995) who note the likely geographies in which NO_x trading programs will develop, namely those places farthest from ozone NAAQS attainment. The first OMT program became active in New Jersey on August 2, 1996. Subsequently, programs were created in Texas, Illinois, Massachusetts, New Hampshire and Michigan. All the programs derive certain guidance from the OMTR and the Emissions Trading Demonstration Project managed under the NESCAUM/MARAMA.[9] However, only Illinois and Michigan have received EPA approval for their respective OMT programs. Michigan's program was granted final approval in October 1997, followed by Illinois in October 2001. The remaining programs have either yet to be approved or, in the case of New Jersey, the program is no longer viewed as a useful initiative and is being phased out.

Ayres (2000) discusses the programmatic approach to most of the state-level OMT programs today. All of the systems rely on a credit registry to track emissions trading and to facilitate transactions. That interface is aided by the reporting mechanisms in place at state agencies and includes notices of credit generation, intent to use, and notices of where credit use actually took place.

Furthermore, all of the programs have measures in place to deter emissions "spiking" that can result when high credit use, and consequently high emissions, occurs in a localized area. To prevent spiking, the NESCAUM/MARAMA framework suggests a practice of intertemporal trading that requires credits generated in an ozone season to be used in the same season or stored for later ones (NESCAUM, 1996). According to EPA, intertemporal trading could occur in the same ozone season, from one ozone season to the next, or from one ozone season to a non-ozone season. However, DER credits that are generated in a non-ozone season cannot be used for compliance during an ozone season (EPA, 1995).

The New Jersey and Texas programs deviate from the federal OMTR by restricting the use and generation of credits to the same ozone season. Texas also places a ceiling on the number of credits that can be used at any given time (Texas Administrative Code, 101.29(d)). Alternately, the program in Massachusetts enables credits generated in any ozone season to be sold at any point in the year (Mass. Regs. Code tit. 310, 7.00).

Although the 1995 OMTR invited states to include provisions for inter-pollutant trading, New Hampshire is the only state to do so. That rural state seeks to lower NO_X emissions which lead to greater reductions in ozone compared to VOC cutbacks because of limited NO_X emissions. As a result, companies can trade NO_X for VOCs at a 1:1 ratio, but not vice versa (New Hampshire Department of Environmental Services [NHDES], 2004).

None of the programs allows the use of credits to avoid BACT, LAER, NSPS, or NSR requirements, which was disallowed under the 1995 OMTR to comply with the 1994 EIP. However, EPA did seek comment on the potential uses of DERs under OMT

to comply with NSPS, BACT and LAER requirements due the additional flexibility and cost savings open trading could provide (EPA, 1995). DER credits, though, are being used to meet RACT emissions limits, offset requirements, and AELs, the latter of which only occurs in New Jersey.

The differences in OMT systems depict the variation enabled by non-binding guidance and includes the credit generation potential of production curtailments and plant shutdowns even though federal guidance was resolute on OMT's relation to reduced production periods. EPA said it believed that credits obtained through production curtailments or shutdowns enabled companies to gain credits from lower emissions levels that would have occurred anyway. As a result, that type of generation would allow for higher emissions periods not offset by real emission reduction measures (EPA, 1995).

The New Jersey and New Hampshire programs reflect EPA's position and disallow the creation of DER credits related to production cutbacks or facility shutdowns. Massachusetts permits shutdowns and curtailments for credit generating purposes as long as credits are adjusted for shifting demand and credit users realize new restrictions could be put in place (Ayres, 2000). However, the Michigan and Texas programs do allow for shutdown credits, exposing one of the many inconsistencies and deviations from federal guidance among state-level OMT programs (EPA, 2002).

The quality assurance system for DER credits also differs by state program. Guidance published by the NESCAUM/MARAMA project places responsibility on the user of DER credits to prove that the credits are the result of actual emissions reductions during program audits (NESCAUM, 1996). Therefore, any quality assurance measures undertaken on credits available for purchase would be driven by private interests and

could range from being comfortable with a broker's reputation to performing an audit on the generator's quantification procedures.

The number of emissions allowances granted by individual DER credits is also an area of disagreement among OMT programs. Each ton equates to one DER credit under the Michigan and New Jersey program (UER, 1995b). Texas also takes that approach, but allows carbon monoxide (CO), SO_2, and particulate matter to be traded under its program as well. However, the OMT program in Massachusetts, which also trades CO in addition to NO_X and VOCs, equates one credit to five tons of emissions (Ayres, 2000).

Ayres (2000) also points out how the legal liability of credit quality varies among open trading programs. Massachusetts circumvents the potential trading of poor-quality credits through a state pre-certification process. In turn, Massachusetts avoids the open trading allowance of back-end certification and takes on the liability of credit quality. The New Jersey and Texas programs place the legal liability on the generator. However, in New Jersey, the user must ensure that a number of administrative tasks are completed. Independent verifiers in the form of certified accountants or engineers are also required in the New Jersey program as an additional measure to ensure credit quality.

While the inclusion of a third party verifier adds an additional layer of oversight to the OMT programs, the verifier's liability is unclear and is more analogous to that of an auditor. Texas omits third-party certification by requiring credit generating firms to share quantification protocols directly with the government, a measure suggested under the NESCAUM/MARAMA system. Also, the Texas program adds additional liabilities to the user of credit as it requires the user to perform a certain amount of "due diligence" to ensure the credits are the result of real emissions reductions.

Differences are also evident in how state programs enable companies to engage in interstate trading. Massachusetts, New Jersey and guidance published under the NESCAUM/MARAMA project permit interstate trades. However, the Texas program does not and also restricts the direction of trading within the state, a measure not in place in New Jersey or Massachusetts.

Two of the most active trading programs to date, New Jersey and Michigan, highlight the inconsistencies of emission quantification protocols, an aspect of OMT that was highly contested throughout the program's development. Although the 2001 EIP guidance indicates EPA would review protocols for approval prior to use, that review did not occur. Subsequent to the 2001 EIP guidance being issued, the Office of Air Quality Planning and Standards indicated federal review of protocols would not occur as previously planned. As a result, neither the Michigan nor the New Jersey programs requires federal approval of quantification protocols prior to use.

Variations in OMT programs are also evident in the overall regulatory structure and in relation to the pre-established air program at the state level. For example, New Hampshire operates two separate OMT programs, although the programs produced only 10 emissions credit transactions by June 2001 (EPA, 2002). One is a Discrete Emissions Reductions Credit Trading Program (DERTP) and the other is an Emissions Reductions Credits Trading Program (ERCTP). The ERTCP, unlike the DERTP and general OMT programs, trades ERCs that are rate-based and correspond to permanent reductions in emissions. However, ERCs are not meant to reduce emissions, but to provide greater flexibility to companies seeking to comply with NSR and RACT requirements (DER,

too). As a result, ERCs in the New Hampshire program can be generated from plant shutdowns and production curtailments (DERs cannot).

Both DERs and ERCs can be generated by stationary, mobile, or area sources to trade NO_X and VOCs. DERs and ERCs can both be used to comply with RACT requirements (NHDES, 2003). However, since ERCs are the result of permanent emissions reductions, they are typically scarcer and ten times more expensive than DERs. That scarcity and expense leads companies in New Hampshire to use DER's for short term compliance needs and ERCs for long term solutions to compliance (Reason Public Policy Institute, 2003).

CHAPTER 4

A REVIEW OF AIR POLLUTION CONTROL IN NEW JERSEY

4.1 Early Reactions to State and Regional Air Pollution

Before discussing the problems and obstacles that related to New Jersey's OMET program, it is helpful to place that initiative in the context of the state's historical struggle to combat air pollution and, specifically, tropospheric ozone. Although New Jersey's OMET program was required to "use economic incentives to make progress toward the attainment or maintenance of the NAAQS" (New Jersey State Legislature, 1995), the program's initial concentration on NO_X and VOC emissions placed an emphasis on ozone control, which allows the effectiveness of the program to be evaluated against other smog controlling initiatives used in the state.

The regional capabilities and market-based approach of the OMET program can be considered an innovative approach to suppress air emissions. However, this and other progressive programs undertaken by NJDEP in recent years (see Shinn and Polsky, 2002), are not indicative of the initial approaches to combat air pollution in New Jersey and to deal effectively with regional pollution concerns.

As Dewey (2000) observes, the industrial development evidenced in the Garden State after World War I led to increased public concern over air pollution both within and outside of New Jersey. Responses to that public outcry in the form of government action in New Jersey were secondary to the state's response to concerns over economic viability and the accuracy of science, and was driven by the prominent placement of industry

officials in state authoritative bodies and the lack of interest portrayed by heavily industrialized counties to control aerial emissions.

New Jersey's resistance to a proactive response to its industrial emissions, though, was facilitated due to the absence of a formal, obligatory emissions control program in the state and throughout the metropolitan area. While the need for a regional system was obvious early on, implementation was prevented by the protection of "local prerogatives" which deterred the creation of an effective air pollution control authority. However, the success of local efforts to resist control efforts also sparked a prolonged campaign to establish an emission control authority to cover the entire metropolitan area (Dewey, 2000).

As early as 1880, a collaborative investigation undertaken by the health departments of New York State, New Jersey, and Staten Island reviewed the impacts of interstate pollution. This study, and similar ones conducted in 1908 and 1913, linked emissions from industries in New Jersey to pollution in New York, particularly in the area of Staten Island (Dewey, 2000).

Early air pollution from New Jersey also posed "jurisdictional problems" throughout the waterways adjacent to New York City. New Jersey emissions that collected over the New York Harbor were troublesome enough to cause harbor officials to lobby Congress for a law to grant federal officials authority over smoke abatement in harbor areas. Also, in a failed attempt in 1900, the Staten Island Chamber of Commerce lobbied Congress in support of a bill that would have granted federal officials jurisdiction over the air quality above New York shipping lanes (Stradling, 1999).

A more comprehensive air pollution study was performed by the Stevens Institute of Technology in Hoboken, NJ in cooperation with the US Weather Bureau in 1931. Using Manhattan weather stations, the sources and quantities of air particles above New York City and their reaction with the prevailing winds were evaluated. That research project concluded that most of the pollution in Manhattan originated in the heavily industrialized area of Jersey City. Further studies mandated by New York Governor Franklin D. Roosevelt in response to those findings, and commissioned by the state Health Department in 1931, found "heavy concentrations of atmospheric dust and sulfurous fumes on the part of the island nearest New Jersey" (Dewey, 2000).

Subsequent to those initial findings, a number of failed attempts, mostly initiated by New York, took place to address air pollution and the growing number of grievances made by Staten Islanders after World War II, which included stomach disorders, irritated noses and eyes, and inability to sleep. All complaints were claimed to be the result of New Jersey's emissions (Dewey, 2000).

Beginning in 1949, the New York State Health Department initiated a series of conferences to address interstate air pollution that included the US Public Health Service and officials from New Jersey and New York City. Those efforts proved unable to offer any conclusive reports because of budget constraints and the lack of qualified technicians (Dewey, 2000).

The New York City Bureau of Smoke Control began in 1951 to publicize photographic evidence of the impact that New Jersey's emissions had on New York City. Those images, combined with the increased intensity of complaints and odors, prompted numerous informal requests by New York's health department for New Jersey to abate a

greater amount of its industrial emissions. However, officials in New Jersey's metropolitan counties claimed that they were doing more than "practically nothing," as New York had contended, and resisted accepting fault for New York's air pollution problems. Instead, New Jersey advocated voluntary self-policing of industrial emissions by private companies, heightening the need for a more regional approach to deal with air pollution that transcended territorial borders (Dewey, 2000).

New Jersey's resistance to accept the blame for interstate air pollution problems affecting New York was consistent with its lack of action to curb concerns originating inside of the state. After a progressive measure in 1931 to establish the country's first Department of Smoke Regulation in Hudson County, few measures, if any, were taken throughout the state, and the Hudson program deteriorated by the late 1930s. In line with the reaction of Staten Islanders following WWII, complaints about air quality within the state grew to a level that forced the New Jersey Department of Health to initiate a small air pollution investigation program (Dewey, 2000).

The same complaints compelled the New Jersey legislature finally to initiate state and regional actions to both study and reduce industrial air emissions. In April 1950, a special legislative commission was formed to study air pollution further in the state. Two years later the commission issued a report that connected the state's air pollution problems to its major oil, chemical, and metal processing industries in addition to smoldering dumps, utility generating stations, and other traditional sources. However, a state bill that could have implemented the commission's recommendations was ultimately defeated by unanimous opposition from the state's industry. Particular opposition was put up by the Republican delegation from Bergen County and Democratic officials from

Hudson County, both resistant to increased government regulation that affected their large industrial districts (Dewey, 2000).

Instead, the legislature passed the Air Pollution Control Act in 1954, which created a nine-member Air Pollution Control Commission within the State Department of Health. The commission's structure and the close involvement of industry officials, though, all but guaranteed its ineffectiveness. Additionally, and to the detriment of air quality, major polluters were also successful in ensuring that New Jersey did not financially support a regional air pollution study by the Interstate Sanitation Commission (ISC), an organization more formally known for monitoring interstate water pollution (Dewey, 2000).

From this point on, only the pressures from highly publicized events that involved the perils of its air pollution, and the threat of federal intervention to deal effectively with interstate air pollution problems, would successfully stir New Jersey to action. Not until 1955, when the New York City Department of Air Pollution Control wrote a formal request to the US Surgeon General to assist with interstate air pollution problems, did the New Jersey legislature offer and pass legislation to fund the ISC study. Following the study, which exposed the enormous economic losses and health impacts from air pollution in the metropolitan area, New Jersey refocused its pro-business efforts and successfully blocked attempts to provide the ISC with any real air pollution control authority in the region. Instead, New Jersey officials, along with representatives from New York City and New York State, created the New Jersey Cooperative Committee on Interstate Air Pollution to place a greater emphasis on previously ineffective coordination and cooperation between state and local agencies already in place (Dewey, 2000).

Predictably, progress was limited as the majority of state officials in New Jersey, including the governor, feared the economic losses from implementing air pollution controls and the employment risks from regulating the major oil, chemical, and metal-processing industries throughout the state. The lack of improvement was all but guaranteed, as the ISC study pointed out, in that no more than three or four of the cities had access to staff with sufficient training in pollution control, and many small communities were so dependent on local industry that any attempts to reduce air emissions would be ineffective (Dewey, 2000). With only a small number of exceptions, most municipalities spent only a small amount of money to limit or reduce the amount of air pollution prior to the late 1960s (Burch, 1967).

Understanding pollutant transport within the state was also critical to improving air quality, another task New Jersey was poorly positioned to tackle even with political support. The interjurisdictional magnitude of air pollution was not generally known and any data that could add clarification was not very reliable. Furthermore, none of the testing stations or monitoring programs installed up to 1967 had been set up to discern the amount of pollution crossing municipal or county borders (New Jersey Air Pollution Control Commission, 1966).

Not until 1967 would officials in New Jersey organize a new and enhanced air pollution control agency in response to citizen protests in the state capital and national press coverage of dirty air hovering the state. Amendments to the Air Pollution Control Act eliminated the Air Pollution Control Commission and established the Clean Air Council even though the industry-dominated Air Pollution Control Agency and the New Jersey Chamber of Commerce continued to resist every change (Dewey, 2000).

The new, broadly represented council empowered under the Department of Health was authorized to distribute construction permits and certificates of operation in accordance with emission standards and state-of-the-art control technology to initial and pre-existing emission sources. Also, additional amendments created New Jersey's motor vehicle inspection program (Stansfield, 1989). Real progress to reduce air pollution in New Jersey, though, had to wait until after 1970 when the CAA amendments were passed.

Justification for federal intervention was not solely based on the resistance to control air pollution in the Garden State. New Jersey was among many territories -- New York, Missouri, Illinois, Indiana, Ohio, West Virginia, and others -- that exemplified the "continual nonfeasance of squabbling states" to control air pollution. That resistance met the growing cry of frustrated citizens against dirty air and eventually initiated action by the federal government (Dewey, 2000).

Two notable attempts to avoid a federal role in air pollution control, the 1963 Clean Air Act and the Air Quality Act of 1967, ultimately joined the long list of unsuccessful initiatives to improve the deteriorating relationship between New York and New Jersey over interstate air pollution. Under the Air Quality Act, New Jersey had the obligation to adopt regional air quality standards for those pollutants for which air quality control techniques had been issued by the National Air Pollution Control Administration (Metropolitan Regional Council, 1969). The Clean Air Act also made available a larger number of grants for state and local programs to curb air pollution. However, as Dewey (2000) attests, both initiatives "could not show enough progress soon enough to satisfy

the increasingly radical environmental sentiments of the American people as the nation moved toward 1970, the first Earth Day and . . . the CAAA of 1970."

4.2 Impacts of the 1970 Clean Air Act Amendments

The reauthorization of the CAA in 1970 finally shifted the authority of air pollution control to the federal level and established NAAQS for specific "criteria" pollutants. The list of pollutants identified to effect human health and the natural environment negatively included ozone, a respiratory irritant also responsible for crop and plant damage.[10] In accordance with the new amendments, the air quality in New Jersey and other states had to comply with the newly established federal standard for ozone or any of the other five criteria pollutants identified under the Act -- CO, SO_2, lead (Pb), NO_2, and particulates.

The original intent of the CAA was to require states to comply with the ozone standard (Maximum daily one hour average of 0.08 ppm) by 1977. However, as this deadline approached, it was evident that the entire eastern portion of the United States would fail to meet the standard.

Realizing the overt aggressiveness of the 1970 revisions, Congress amended the CAA again in 1977 to extend the deadline for compliance with the ozone standard to 1982 and also allowed extensions to 1987 for parts of the country with unique air quality challenges. Any state that was granted an extension was required to establish motor vehicle inspection and maintenance programs and to outline additional measures to reduce pollution contributing to ozone formation. That federal change, in addition to the move by EPA in 1979 to weaken the ozone standard from 0.08 to 0.12 ppm, enabled the

majority of areas to enjoy the benefits of compliance with the federal standard except for heavily urbanized areas such as New Jersey.

Regardless of the early modifications to and tribulations with the initial criteria pollutants, the ozone standard has proven the most problematic for New Jersey in terms of compliance. That has remained true even in light of the early rulemaking approach in New Jersey to combat the release of ozone precursors subsequent to the CAAA and the creation of NJDEP in 1970, which centralized the majority of air quality concerns.[11] While, in certain cases, New Jersey air quality rules reflected the minimal safeguards established under federal law, on numerous occasions New Jersey strengthened the pollution control requirements for industrial and commercial sources, particularly for VOCs, establishing some of the strictest control requirements in the country (Stansfield, 1989).

One of the factors behind New Jersey's conservative approach to regulation early on was that rules were largely based on the assumption that less air pollution was better for health. This approach grew from the lack of knowledge about what concentrations of most pollutants, if any, were safe to breathe, and also prevented the state from having to wait for unquestionable scientific evidence of danger before it put measures in place to control a potential health hazard (Stansfield, 1989).

Conservative approaches to regulation were also justified to deal with the complexity of New Jersey's air emissions, particularly hazardous air pollutants, which included certain VOCs. By the 1980s, over 800 plants were categorized as major stationary sources of air emissions in the state and included power plants, manufacturers and petroleum refineries. Together, those companies accounted for more than 35,000

stacks, tanks, incinerators, and processes, all of which contributed air emissions. Also, more than 10,000 plants held permits for operations that emitted smaller streams, and an untold number of facilities did not have to register with the state because they were operational prior to the rules becoming effective (Stansfield, 1989).

Despite initial attempts to reduce emissions in New Jersey, in 1980, significant solvent use, a large industrial sector and a high density of gasoline pumps contributed 1000 tons of VOC emissions per day and a significant portion of NO_X emissions. To make matters worse, those emissions only added to the large volume of air pollutants entering the state from neighboring areas (Stansfield, 1989).

As a result of New Jersey's unique air quality challenges, the federal government extended the ozone compliance deadline for the state until 1987. In exchange, New Jersey identified additional measures to decrease ozone precursors when the state revised its SIP in 1983. Failure to meet the extended deadline posed a risk of being denied federal funds for highway construction and sewage treatments facilities, as well as a ban on new construction that would produce additional air emissions.

4.3 The Ozone Struggle

Subsequent to the receipt of a federal extension to comply with the ozone NAAQS, New Jersey participated in the Oxidant Modeling for the New York Metropolitan Area Project (OMNYMAP) along with New York and Connecticut in the early 1980s. Combined with EPA's Regional Oxidant Model (ROM), the project aimed to simulate the movement and changes in concentration of air pollutants in the region to establish useful methods of ozone regulation. The modeling program supported the notion that the level of ozone and

ozone precursors blown into the state was sufficient to cause New Jersey to violate (exceed) the ozone standard even in the absence of any source emissions in the Garden State (Stansfield, 1989). Unfortunately, with little authority under federal rules to address interstate air pollution issues, New Jersey was limited to regulatory initiatives that affected its own emission sources to demonstrate air quality improvement.

Years of study and the paucity of well-defined initiatives gave the initial indication that New Jersey might not be able to gain control of the ozone problem in time to meet the 1987 deadline, or be able to follow through on the ozone reduction initiatives outlined in the SIP. One of the first attempts to suppress ozone included a new requirement for the state's 4,600 gas stations to install "Stage II" recovery systems or unique nozzle hoses on gasoline pumps to deter vapors from being released during use periods. According to NJDEP, that measure would capture 15,900 tons of VOCs annually at a cost of $50 - 75 million, much to the dismay of the petroleum industry ("DEP set to," 1986). The agency deemed the measure necessary due to the conviction that the then-new federal automobile regulations to reduce vehicle emissions would take ten years to demonstrate improvements in air quality ("Delay seen in," 1985).

Environmental groups, dismayed with New Jersey's belated policy push to control ozone formation, quickly pointed to inconsistencies between the Stage II program and government subsidy allocations within the state. At the same time New Jersey was struggling with gas station vapors -- only a small part of the air pollution problem by NJDEP's own estimates -- Washington and Trenton generously subsidized billions of dollars for wider highways in the state. Concurrently, the New Jersey Turnpike Authority was embarking on a $2 billion expansion program that would allow for an 80 percent

traffic increase by 2004 and help accommodate a statewide 34 percent increase in automobiles since 1970. Such an expansion would deter federal compliance as NJDEP acknowledged that automobiles contributed to at least one-third of the metropolitan area's air pollution problem ("Danger: Ozone," 1987).

Despite the postponement of the Stage II program as a result of federal intervention in 1987, New Jersey successfully reduced annual VOC emissions to 575 tons per year as a result of stricter emissions controls on refineries and petrochemical plants, the installation of catalytic converters on automobiles due to federal requirements and state-mandated auto inspections. However, New Jersey remained 152 tons per day short of the required 423 ton reduction set by the CAA by the end of that year ("For healthier air," 1987).

At this point, it was clearly evident that New Jersey would not comply with the 1987 deadline. Instead, the state violated the ozone standard 123 times through August 1987 according to EPA, more than the same period of any year since 1981 ("Ozone pollution in," 1987).[12] Furthermore, the New York metropolitan area, which includes Bergen, Passaic, Hudson, and Morris Counties, had the third-highest ozone concentrations in the country after Los Angeles and Houston ("DEP set to," 1986). State environmental officials adamantly pointed out that NJDEP was lagging on many, if not all of the ozone reduction measures outlined in the amendments to the state SIP in 1983 (Boxall, 1986).

Rather than plead with federal authorities to avoid sanctions, New Jersey criticized the federal government in 1987 -- specifically EPA -- for not imposing regional controls to alleviate the obstacles of interstate pollution. State environmental officials

claimed that New Jersey would be unable to resolve its ozone problem without federal intervention on a regional basis and did not believe the state should take "draconian" measures to do so as a result of the invasion of interstate pollution (Boxall, 1987; Markowitz, 1987).

But New Jersey was not alone. The sheer magnitude of the number of states that did not comply with federal clean air standards during the latter 1980s prevented EPA from imposing sanctions on states. The New York metropolitan region was just one of sixty urban areas around the country to miss the 1987 deadline ("Danger: Ozone," 1987).

The absence of federal punitive initiatives was offset by intrastate actions aimed at pressuring NJDEP to implement programs previously established as worthwhile actions to improve air quality, regardless of complications created by invasive air pollution. At the end of 1987, the growing impatience of a coalition of environmental groups led to a suit and eventual finding against the Governor and NJDEP for failure to implement the state ozone plan. The ruling required NJDEP to put a policy in place by October 30 of that year to reduce ozone in seven ways, including the imposition of controls on the coatings of buildings, the unloading of gasoline barges and the installation of vapor-capturing nozzles on gasoline pumps ("Ozone ruling: NJ, 1987; Merrill, 1991). At the same time, New Jersey was also pursuing a fee-based system on source emissions, a potential ban on consumer and commercial products that contained solvents, and changing the contents of gasoline sold during the summer months. But most measures would not be in place until the mid-1990s (Markowitz, 1987).

4.4 The 1990's and the Advancement of Regional Cooperation

The 1990 amendments to the CAA revised regulations for all of the criteria pollutants and required revision to SIPs so that abatement strategies for ozone and its precursor pollutants could be outlined. As a result, once again the deadline to comply with the federal ozone standard was delayed and sixty areas nationwide avoided federal sanctions arising from violations with previously established ozone limits.

With eleven major sections totaling roughly 800 pages and a projected annual cost of $32 billion (as estimated by EPA), the 1990 amendments would cost New Jersey business roughly $1.4 billion each year according to the New Jersey State Chamber of Commerce. Such costs would inevitably be passed to consumers and, according to the Chamber, would result in economic and competitive disadvantages in a state where conservative air pollution policies were already in place (Kiely, 1990).

The structure of the law and its concentration on motor vehicle and industrial emissions made a deep impression in New Jersey. With urban smog being a main point of focus in the revised law, New Jersey was ranked "severe" under a new categorical scale outlining specific restrictions that included the requirement for oil companies to sell reformulated gasoline with higher oxygen levels within state boundaries.[13]

The number of industrial plants regulated in New Jersey also changed. Before the new smog provisions of the CAA, only sources that annually emitted fifty or more tons (around 800 sources in NJ) were covered under New Jersey air quality regulations. The federal amendment expanded the state's regulatory umbrella to impose strict pollution control requirements on 4-5,000 facilities and encompassed even small emitters such as dry cleaners and bakeries. Companies that emitted more than 25 tons per year of VOCs

would soon be required to comply with RACT requirements. Similarly, upcoming MACT requirements would impose stricter requirements on companies that emitted more than ten tons per year of any toxic chemical as defined by the Act. NO_X reductions would also be reduced by the state's utilities under the new acid rain provisions.

The 1990 amendments paid particular attention to ozone, requiring a 15 percent reduction in smog-causing pollutants by 1996 and 3 percent each year thereafter with full compliance required by 2005 for severely affected states such as New Jersey. However, the savings clause within the 1990 amendments provided for the continuing validity of existing SIPs.[14] As a result, New Jersey's attempt to extend the deadline for reducing ozone until 2005 was declared "clearly impermissible" by a federal judge due to the pre-existing court order which mandated New Jersey's SIP be revised in 1987 so attainment could be met by 1996 (Kiely, 1990; New Jersey Law Journal, 1994).

In spite of the imminent compliance deadline, New Jersey and NJDEP remained consistent with previous approaches to improve the state's air quality -- staying away from extreme initiatives due to the volume of air pollution blowing into the state. Instead, the pursuit for cleaner air in the state began to integrate more fully the market-based concepts and regional organization tools recognized by the new CAAA that were driven by the economic implications of delayed non-compliance with air quality standards (Gray, 1992).

The transition to regionalize ozone compliance measures was advanced in 1992 when NJDEP permitted new companies to trade NO_X emissions with established facilities, a measure that extended offset privileges already in place for VOCs (Merrill, 1992). A separate but voluntary initiative, New Jersey's agreement to participate in the

federally established Ozone Transport Commission in 1992 gave momentum to the collective approach states were seeking to meet new federal ozone requirements. These measures, combined with the OTC's agreement in 1993 to seek offset capabilities between the majority of member states, paralleled efforts by the NESCAUM/MARAMA demonstration group to formulate an OMT program that EPA was set to promote at the national level.

4.5 The Origin of Open Market Trading in New Jersey

In many regards, the decision to integrate OMT into the state's existing air quality regulations could be portrayed as a sensible policy decision. The state was struggling to find methods of regulation that simultaneously balanced air quality improvements and the competitiveness of its industry. In addition, the use of market-based measures and inter-state approaches to emission reductions, particularly ozone precursors, were being pursued as measures to balance commercial and health-oriented concerns while recognizing the regional nature of the ozone problem.

Furthermore, New Jersey had a significant presence within the NESCAUM/MARAMA initiative. Taking part in the project, in addition to NJDEP, were the state's largest utility, Public Service Electric and Gas (PSEG), drug giant Merck and Company headquartered in White House Station, Hoffman-La Roche located in Nutley, and additional smaller businesses. Many of the companies were successful in voluntarily reducing ozone precursor emissions in the demonstration project starting in 1993, the incentive for which was the desire to obtain pollution credits from EPA to be later sold to other companies or used to expand existing operations (Salpukas, 1993).

Additional incentives that pushed the generation and sale of credits originating in the demonstration project, as expressed by PEER (2000) and multiple respondents, included the looming RACT requirements set to take effect in May 1995. Without the availability of credits to offset the absence of appropriate emission reductions, certain large emitters within the state would not be able to comply with the federal air control mandate and would therefore be subject to environmental liabilities.

New Jersey was also among the states required under the CAA to achieve a 65 percent reduction in NO_X emissions by 1999. Trading emissions credits, according to industry officials, would help "clean up the air, speed it up and do it at a reasonable cost" and would also complement the state's existing air quality regulation that would only achieve half of the reduction required by the end of the decade ("Oxides: The next," 1995).

Paralleling emission reductions within the demonstration project was a series of planned, high profile credit transactions to be conducted under a Memorandum of Understanding (MOU) between companies, in which industry attempted to promote the idea of OMT. In March 1994, PSEG announced a potential deal to sell Northeast Utilities of Berlin, CT 500 tons of NO_X credits. Northeast Utilities would, in turn, distribute the credits to smaller factories and hospitals that operated boilers subject to the 1995 RACT requirements ("Oxides: The next," 1995).

The executive director of NESCAUM, Michael Bradley, called the potential credit sale to Northeast Utility a possible "catalyst to a regional market that would help quite substantially in reducing the ozone levels in the summertime." Furthermore, in what could be portrayed as a threat to policymakers, Northeast Utilities stated that the

availability of open market-like credits were critical "if we're going to avoid businesses' shutting down and moving out of the area" (Wald, 1994).

Interestingly, the deal was to be brokered by PSEG's agent, Clean Air Action Corporation, whose president, Ben Henneke, was considered along with Richard Ayres by PEER (2000) as the two individuals who played an "inordinately influential role in driving EPA's policies." As evidence to that claim, they were considered in the August 1995 OMTR as "the original developers" of OMT (EPA, 1995).

Ayres, besides being the author of the influential paper on OMT in 1994, was also an attorney with O'Melveny and Myers of Washington, DC. The law firm represented Henneke "throughout the Agency's [EPA] pivotal decisions to endorse and promote open market trading" (PEER, 2000). Further cementing the political connections between New Jersey industry and federal law makers, Mary Nichols, EPA's assistant administrator, was the wife of John F. Daum, a member of the O'Melveny and Myers firm in 1995. Despite a signed formal recusal from any involvement in the firm that represented Henneke, Nichols wrote to all state air quality directors offering her own and EPA's support for open trading (PEER, 2000).

However, the credit transaction between the utilities never occurred. In a move that killed the deal and signified the need for a formal open market program to facilitate inter-state trades, Northeast Utilities backed out of the deal because the "regulations on interstate trading of pollution rights had not yet been written" (Wald, 1995).

In another credit exchange publicized in New Jersey's *Star Ledger* and *The New York Times* in June 1995 that did occur, Merck purchased credits from PSEG to comply with state and federal RACT requirements. The exchange could allow Merck to buy up to

75 tons of NO_X in 1995 (and each year thereafter until 1998). The *Times* labeled the exchange, which NJDEP had yet to certify, as a new service PSEG could provide to its biggest customers: a "right to pollute" (Wald, 1995 and Perone, 1995). In response to the *Times* article, Merck stated that the trade of credits between PSEG and Merck was a "pioneering effort to develop a market-based, regional response to ozone problems in the Northeast" ("Market responds to," 1995).

With a formal trading program still absent from state air quality rules, companies lacked an instrument to sell and to use credits generated during the demonstration project without going through extended state approval processes as was the case with the PSEG-Merck deal (including public comment periods on the proposed credit transactions as part of SIP revisions). That would prove particularly problematic for PSEG because the utility had amassed the greatest number of credits of any firm during the demonstration project and, at the time had several more trades under consideration ("Oxides: The next," 1995).

Publicly, NJDEP also supported OMT, the extent of which increased in the press after the informal unveiling of EPA's proposed OMT rule in June of 1995. NJDEP Commissioner Robert Shinn urged EPA to finalize the rule quickly so New Jersey could adopt its own OMT program in the near future (Johnson, 1995).

According to one of my respondents, though, support for OMT at the high levels of NJDEP, while sincere, was also a testament to a state political context unwilling to pursue significant emission reductions to achieve federal air standards. The extent of that resistance, which climaxed to a "crisis point" in 1994 with the new Republican majority at the national level, led to NJDEP being "beaten to death," according to the respondent, due to the state legislature's stance that the environmental body was an over regulatory

institution. Furthermore, any drastic emissions reduction measures pursued by NJDEP at that time were perceived by the state legislature as an invitation to restructure the department's top management to make it more receptive to restrained policy measures. With that in mind, NJDEP searched for incentive-based approaches to regulation like OMT to improve the state's air quality and to endure a combative political situation.

Additional interviews with participants confirmed this support for OMT at the high political echelons of NJDEP, but also signified that it ended there as well. As pointed out by one respondent, environmental officials responsible for the actual management of the air program within NJDEP viewed OMT as an avenue for industry to shortcut air quality regulations, and those officials did not trust a private market approach to regulation. Managers were specifically concerned that companies would be granted DER credits for emissions reductions "that would have happened anyway" and feared the creation of hot spots within the state as a result of the use of large numbers of credits in particular areas.

Resistance to the unique trading program within NJDEP was soon trumped by a major overhaul of the state's air pollution law in August 1995 that provided the vehicle for OMT to manifest in New Jersey. The passage of the 1995 amendments to the Air Pollution Control Act (APCA) came when New Jersey was facing multiple federal deadlines to amend the state's air pollution control law. The amendments were passed by a legislative majority that, according to one respondent, "did not understand what they were voting on."

The APCA amendments required NJDEP to propose rules and regulations that established an emissions trading and banking program, although they did not specifically

require an open market approach. However, the language of the bill and the timeline for implementing the amendment's provisions all but guaranteed the selection of OMT. The legislation specifically required the department to "consider the role of a third party in the banking, verification . . . and program audits associated with emission reduction credits" and to "create and preserve opportunities for private sector participation in any emission trading program established by the department" (New Jersey State Legislature, 1995). All of these were characteristic of OMT. In addition, the mandate placed on NJDEP the task of proposing new rules and regulations for the trading program within 90 days all but isolated the choice for OMT because of its low startup requirements.

According to multiple respondents, the specific language of the bill was neither attributable to input by NJDEP nor to the bill's sponsors having knowledge of the intricacies of OMT. Indeed, the open market-like references within the legislation were the direct result of a successful lobbying campaign on behalf of industry, including PSEG, conducted by Michael Bradley, the former NESCAUM director-turned-consultant for the large utility company and other businesses around the state interested in OMT.

As a result, New Jersey quickly began to implement the industry-sponsored program which, according to one of OMT's biggest advocates, Gov. Christie Todd Whitman, would "help New Jersey improve air quality and the quality of life for business" (Page, 1995).

The extremely tight schedule forced NJDEP to promulgate the OMET rules in two stages. Stage I would create the basic structure of the program. Stage II development would include more opportunities for public comment and would incorporate a

development design team to refine the program once it was up and running (NJDEP, 1996).

State environmental officials announced the Stage I rules on February 20, 1996, and the OMET program became active on August 2, 1996. With EPA still unable to finalize federal guidance on OMT, some New Jersey companies, albeit not many, began trading DER credits to fulfill federal RACT requirements. At that point, no one could predict that the program would be terminated six years later by a new NJDEP commissioner who labeled the program "an experiment that failed" (Mansnerus, 2002).

CHAPTER 5

THE DEMISE OF OMET

5.1 Preface

The amendments to New Jersey's APCA instigated one of the few movements by states to incorporate OMT into environmental law. Commanding NJDEP to complete a nearly impossible task, according to one respondent, the Act's signing on August 2, 1995, required state environmental officials to propose and adopt rules within 180 days for what would become the state's OMET program.

More than just a credit swapping plan, New Jersey's OMET program would be considered a "national model for making clean air profitable for polluters who reduce their own emissions." Some commentors labeled it as "one of the hallmarks" of former Governor Christie Whitman's environmental policies and the program later became an initiative that she would promote at a national level after becoming head of EPA (Halbfinger, 2001; Nussbaum, 2002; Twyman, 2002b).

Therefore, the decision by the current NJDEP Commissioner Bradley M. Campbell to write off the once acclaimed credit trading program as "an experiment that failed" in September 2002 is all that more surprising (Mansnerus, 2002). As the program is now in the final stages of being phased out, the decision to end OMT in New Jersey warrants a discussion as to whether open trading is flawed in a theoretical sense or whether the program's demise was the outcome of mismanagement by state environmental officials. The results from this study support the latter explanation.

This assertion is the result of NJDEP's unequivocal failure to execute the few obligations it was responsible for under the state's OMET program -- credit audits and enforcement -- and this enabled the program's shortcomings to be cloaked under a myriad of complementary announcements by stakeholders. Those lone civil responsibilities to a program largely under the control of the private sector were especially warranted following the decision to grant private facilities unprecedented control to quantify and generate emissions credits that would later be sold to companies seeking to comply with federal air standards. Furthermore, the recognition by state environmental officials to fulfill their obligations failed to transpire in lieu of highly publicized events which should of prompted greater program oversight.

Despite the absence of concrete safeguards early on, NJDEP sought to protect the program's flawed construct instead of incorporating regulatory measures appropriate in OMT programs according to federal officials in 2001. Those measures, outlined in EPA's EIP guidance, would have aided in protecting New Jersey's program from the same flaws that ultimately caused the program to be terminated.

5.2 Program Development

The language and deadlines of the 1995 APCA imposed a significant obligation on state environmental officials. With "no infrastructure to implement the [OMET] program" at that time, according to one NJDEP respondent, environmental officials took on the responsibility of OMT when department resources were being cut 20 percent in regulation, permitting, and enforcement under the Whitman administration (Environmental Law Institute, 2002). There was, according to the respondent, an

"unwillingness to assign people to manage the [OMET] program," despite Whitman's claim that the 1995 bill gave "the Department of Environmental Protection the resources it needs" (Page, 1995).

Absent a final EPA OMTR and under an "extremely tight schedule," NJDEP sought to include "those provisions of USEPA's proposed OMTR for which a consensus appeared to exist" and at the same time "address[ed] issues which the proposed OMTR [did] not yet address," which the Department believed had to be in place for trading to begin quickly (NJDEP, 1996). That combination enabled, if not forced, New Jersey to settle on a program that was self-implementing with minimal state oversight (EPA, 2002).

Consequently, NJDEP side-stepped time-consuming measures to safeguard the OMET program including the establishment and approval of emission quantification protocols for industry use. Also, credit verification became the sole responsibility of third party validators to avoid the OMET program becoming a burden for the state (EPA, 2002). At the same time, this same combination of factors provided an excuse to delay decisions on much less time-intensive -- but nonetheless important -- functions such as a proper audit frequency (NJDEP, 1996).

Federal officials were clearly becoming wary over the program's direction during its development in 1995 and 1996 due to constant changes in thinking and a sheer uncertainty as to how OMT should operate. The most contentious and misguided issues were DER verification, quantification, and liability. The delegation of credit verification to the private market and the potential conflicts of interest that could result were "the

area[s] most people in headquarters [had] concerns about when discussing NJ's OMET program" (EPA e-mail to NJDEP, May 22, 1996).[15]

Federal EPA officials in Washington, DC also wanted New Jersey "to list some criteria in the rule on what should be addressed in the [quantification] protocols." The 1995 OMTR recognized the potential impact that protocol use and development could have on open market programs. The requirement to have pre-approved protocols before firms could claim DER credits was recognized as a requirement that could strain government resources and greatly hinder the development of OMT systems. NJDEP would need dozens, and possibly hundreds, of specific protocols to tend to the diverse nature of mobile and stationary sources authorized to generate and trade DER credits (EPA, 1995).

In response to this market obstacle, EPA sought to work with states to establish guidance for acceptable protocols that would create "meaningful standards for the kinds and quality of data required to support the calculation of amounts of emissions reduced by generators or needed by users." In turn, industry would be able to employ, and be held to this guidance, to create protocols specific to various commercial operations (EPA, 1995).

State environmental officials were discontented with EPA's prior efforts to develop protocols for stationary and mobile sources that required "complicated quantification techniques, which included statistical analysis, that were overwhelmingly objected to by process participants" and led to the creation of an "unmanageable trading system" (NJDEP, 1996). Instead, NJDEP sought to "rely on its own experience and expertise with stationary and area sources" to develop unilateral quantification guidance

for companies within the state (NJDEP, 1996). Companies could then use this guidance to formalize their own protocols which would utilize alternative compliance mechanisms already in use (e.g., stack emission testing). However, Region 2 officials responsible for the approval of New Jersey's approach to quantification were left in the dark as to what officials at EPA headquarters would require in state guidance. They stated that "obviously, it would help if we knew what that [sic] criteria [were]" (EPA e-mail to NJDEP, May 22, 1996).[16]

The issue of liability associated with DER credits in the OMET program also sparked disagreement within EPA. In the OMET program, if credits previously verified and used for compliance were eventually found to be invalid, the credit user would not be liable for the invalid credits, and no penalty would be applied. The user would only be expected to replace invalid credits with valid credits (EPA, 2002). The OMTR stated that the principle of buyer liability would work the best to assure DER quality (EPA, 1995).

These examples of New Jersey's unilateral approach to OMT exemplified the difficulty in developing state programs in the absence of a final, binding OMTR and highlighted the reasoning behind the decision to authorize the OMTR as only guidance. Region 2 officials quickly realized the program's distinctive nature and this led EPA to "not judge NJ's rule against the OMTR" as the state's program was "something different" from EPA's proposed rule. Instead, New Jersey's trading program would be classified as a stand alone EIP and would consequently "be judged by the criteria for all State Implementation Plan submissions -- that they be enforceable, compatible with the Act [CAA], protective of the NAAQS, etc." (EPA Region 2 communication with NJDEP, March 21, 1996).

Despite clear uncertainties in New Jersey's forthcoming trading program, federal officials remained inclined to "let NJ try it" (EPA Region 2 communication with NJDEP, May 22, 1996). The OMET program could, in fact, then be viewed as an experiment in regulatory incentives to improve air quality. In other words, the sole federal publication on OMT would not be the standard for a proper or improper open market program. Instead, New Jerseyians were subjected to the trials and errors of public policy, the extent of which, should have prompted careful oversight by NJDEP. Such vigilance would not be forthcoming. On the contrary, state officials remained lax, if not negligent throughout the program and simultaneously promoted the air quality benefits of a credit trading program that could never be appropriately quantified for EPA.

5.3 Reasons for Closure

A significant deficiency in New Jersey's OMET program was its inability to communicate and confirm the program's actual environmental benefit. The federal OMTR was clear in its intention to simultaneously reduce the cost of compliance *and* promote emissions reductions to provide immediate public health benefits. The proposed federal rule also stipulated that any state seeking to incorporate OMT programs had to comply with federal guidance for all EIPs and this stipulation required incentive programs to be "designed to benefit both the environment and the regulated entity" (EPA, 1995). The OMET program clearly violated this condition. New Jersey's own SIP submission clearly stated "no VOC or NO_X emissions reductions were projected to be associated with the implementation of the NJ OMET program" (Wolfe, 2001).

However, the absence of claimed reductions in the state's SIP did not thwart state efforts to promote or publicize the program's ability to improve air quality. NJDEP, politicians, and corporate managers that successfully lobbied for OMT regularly identified and promoted OMET on the basis of the program's environmental benefits. State officials stated that the emissions trading component of the APCA would result in lower pollution overall and companies expressed the program would clean up the air (Page, 1995 and "Oxides: The next," 1995).

Former NJDEP Commissioner Bob Shinn went as far as to claim the program resulted in 10,000 tons of emissions reductions between 1995 and 1996 (NJDEP, 1997), a statement that gave the impression that the OMET program was not merely an additional compliance option for industry, but also an innovative way to reduce emissions.

The foundation for OMET's environmental benefit claim, though, was masked in an overall goal to provide industry "with a flexible compliance alternative in meeting its continuing, shrinking emission reduction requirements, and, on the same hand, offering an environmental benefit, in that it encourag[ed] early emission reduction and guarantee[ed] a 10 percent retirement of emissions upon use" (Neely, 1996). While news organizations widely reported this claim of a 10 percent retirement benefit, no one publicized the fact that, according to one EPA respondent, EPA Region 2 would not allow the state to claim those reductions in the state's SIP due to insufficient quantification guidelines.

The lack of a serious mechanism to ensure that the generation of credits was the result of real emissions reductions would become the central argument against the state's trading program advanced by environmental groups (Nussbaum, 2002). This argument,

according to one NJDEP respondent, was warranted because allowing industry to generate their own quantification protocols was a "big mistake." Such a provision gave firms the incentive to "push a protocol their way" and to "take advantage of the program." These were outcomes that the official believed occurred.

Justification for this perceived abuse emerged in 1998 when a very contentious issue -- one that had undergone much debate inside EPA -- surfaced. Companies in New Jersey were given the authority to sell DER credits generated before 1996, most of which were from the NESCAUM/MARAMA northeastern demonstration project. EPA Region 2 had "been fighting against this [claiming pre-1996 credits] all the way" (EPA e-mail to NJDEP, May 22, 1996). In spite of this federal resistance, in February of that year, EPA authorities agreed to allow companies in New Jersey to carry over pre-1996 credits, a decision that would allow companies to cash in on just over 10,000 tons of credits. More than 9,500 tons of those credits belonged to PSEG that, based on credit transaction occurring in 1997, had a market value between 9 and 12 million dollars (Callahan, 1999 and Twyman, 2002b).[16] In turn, NJDEP was required to submit to EPA as part of its SIP revision all of the emission quantification strategies used by companies during the demonstration project. In October 1998, as requested, NJDEP handed over ten DER credit generation strategies that had been employed by companies such as Conectiv, PSEG, BASF Corporation, and Interbake Foods Incorporated. EPA determined the following:

> All ten credit generation strategies do not fully address the protocol development criteria of Subchapter 30 [New Jersey's OMET rules], nor are they consistent with EPA's guidance. The deficiencies ranged from minor calculation errors to missing information to basic inconsistencies between the strategy and Subchapter 30 and EPA guidance. For example, Subchapter 30.20(e)(3) required the source to submit records from the

> emission rate measurement/quantification technique. Therefore, EPA expected to see data in fuel use, heat input, unit efficiency, etc., but this information was missing (Callahan, 1999).

Despite EPA Region 2's contention that DER credits obtained through early reductions were questionable, if not invalid, the agency could not take any enforcement action against companies that had used early credits to comply with air quality regulations because New Jersey's SIP revision had not yet been approved, and was therefore not federally enforceable. EPA hinted though that this was a program vulnerability and would be a potential focus for investigation once the program was approved. Federal environmental officials suggested that "the generators, verifiers and any users of the DER credits review these specific DER credit strategies before Subchapter 30 becomes subject to EPA enforcement" (Callahan, 1999).

However, the larger, more pressing issue at hand involved the impact EPA's review had on the balance of credits generated after 1996 -- namely those that had been based on protocols generated in the private sector and, according to one respondent, that were attributable to the demonstration project. By 1999, NJDEP had acknowledged that in the three-year period since the program commenced in August 1996, companies in the state's four most heavily urbanized counties had earned more than 2.5 million pounds of NO_X and VOC credits (Regan, 1999).

Instead of investigating the validity of credits formally generated under the OMET program, NJDEP instead distanced itself from this and other unidentified problems. According to one respondent, when compliance-related problems surfaced, responsible personnel were "discouraged from referring things to enforcement" because the commissioner at the time "wanted to give the program a chance" and "was in favor of

the program and wanted it to succeed." Such problems included clear violations of the state's OMET rules as "some of the companies, at least two or three, maybe more . . . stated they were using credits to compensate for emission limit exceedances as [dictated] by their permit." Even when agency enforcement authorities were alerted, this particular respondent stated, that "enforcement never got to the point of checking it out and issuing a violation, but they were made aware of it."

Interestingly, a senior state environmental official interviewed dismissed the possibility of invalid credits due to the following:

> That's why we have an enforcement program at DEP. The tools are in the enforcement program and . . . the goals of credits are real, verifiable and non-reoccurring. So that is the test when the inspector goes out, to verify . . . credits. Are the reductions real, can you verify it, and are they non-reoccurring. If you can't meet those three tests, you [the company] do not get the credits and that basically [is] why you follow-up the program with enforcement to make sure that those credits actually are real.

Of course, the potential safeguard against completely bogus or skewed credits lay in one of the few real obligations NJDEP had in the OMET program -- auditing. Generation, verification, registration, transfer, and use of DERs was delegated to the private sector, further justifying the need for the department to follow through on its responsibility for program review. Audits would provide assurance that credits firms were claiming were indeed the result of reductions in excess of what was required by an air quality rule, SIP, or Federal Implementation Plan as obligated under program guidelines.

Early on in the program, NJDEP in fact viewed auditing as a measure to prevent the generation of credits from emissions reductions that allegedly would have occurred in

the absence of the OMET program (NJDEP, 1996). State environmental officials also made specific commitments at the onset of the program to, at a minimum, "meet any program audit requirements established in federal regulations or guidance" (at least every three years) in response to comments by EPA that aimed to ensure "that the inter-temporal nature of open market trading [did] not result in continued non-attainment in New Jersey and downwind areas" (NJDEP, 1996).

Here, too, NJDEP failed to fulfill its public commitment. According to one NJDEP respondent, with only one full-time staff person committed to the OMET program, auditing was not "high enough on the department's priority list to do," but "one could say that maybe the department didn't want to know what was going on."

Formally, the state's position to EPA was that New Jersey "didn't need to complete a program audit until three years after EPA approval of the SIP," which New Jersey submitted to EPA at the end of 1998. EPA did not agree with New Jersey on this and tried to point out to NJDEP that the audit was based on implementation of the program and not based on implementation of the program after EPA approval. In fact, EPA told New Jersey that "it was in their interest to complete the audit outside of the SIP process and that positive audit results could help towards SIP approval" (EPA Region 2, personal communication, January 29, 2004). The result was that throughout the entire time OMET was operational (1996-2003), NJDEP never conducted a program audit or verified the accuracy of a single DER credit.

Despite such administrative lapses and resource limitations, state environmental officials did not take additional measures to insure that the OMET program was not vulnerable to abuse. Quite the opposite, NJDEP instead pushed to loosen permits

requirements in December 1999 in an attempt to accelerate DER credit use, a move that was premised upon a desire to give businesses increased flexibility over emission levels during periods of high production demands.[17] The new rules, outlined under Stage II of the program, would "allow companies to exceed permitted pollution limits for limited periods of time" and allow companies "to pay off an expanded number of permit violations with credits" (Regan, 1999).

As NJDEP sought revisions to the state's OMET program, state environmental officials also sought to prevent the incorporation of any additional safeguards into New Jersey's EIP that federal officials deemed to be appropriate for incentive programs. In November 1999, two months after EPA published a draft version of the new federal guidance pertaining to EIPs, New Jersey asked EPA to "grandfather" the state from any new provisions that would pertain to its OMET program (Shinn, 1999). The OMET program would have to meet the new EIP guidelines as New Jersey's SIP revisions had not yet been approved.

To justify that request, NJDEP stated that the OMET rules were based "on the federal model open market trading rule for ozone smog precursors, proposed by USEPA in 1995" and that NJDEP had strived "to adhere to all applicable rules and guidance issued by USEPA" (Shinn, 1999). In actuality, as pointed out in this study, New Jersey's efforts to conform to the 1995 OMTR did not include and/or follow through on a key provision of the federal rule, namely assurances for any environmental benefit, auditing, or proper enforcement mechanisms.

The requirements of the forthcoming federal EIP guidance could have had severe implications on the state's OMET program. As stated, "a decision to make the new

federal EIP guidance applicable to already promulgated [state] rules would effectively remove the availability of open market trading as an administrative instrument that could lower compliance costs for at least two years, if not permanently" (Shinn, 1999). However, this statement, though, was not entirely true. The upcoming EIP guidelines would not remove OMT as an administrative tool, but would rather represent EPA's final action and conditions for OMT that included, among other things, the requirement for industry to certify upon credit generation that quantification protocols met "all relevant requirements of EPA's quantification protocol development criteria" (EPA, 2001), a measure that NJDEP resisted in 1996.

In a move that would eventually shelter the state's EIP from conforming to EPA's final policy requirements on OMT, NJDEP called on EPA headquarters in June 2000 to "proceed as soon as feasible to finalize the action of the USEPA" and approve New Jersey's SIP to incorporate the state's OMET program (Shinn, 2000). Coincidentally, EPA proposed to approve conditionally New Jersey's SIP revision for ozone in January 2001, the same month the new federal EIP guidance was published. That federal action safeguarded New Jersey's OMET program from the new incentive guidance because any SIP that had already been conditionally approved by EPA would be exempt from the new provisions (EPA, 2001). Instead, EPA Region 2 officials sought to work with New Jersey in subsequent years to improve any areas of concern. EPA officials admitted that this task would be more easily accomplished before the OMET program was approved (EPA, 2002).

The conditional approval of New Jersey's program in January 2001, while beneficial for the state's initiative to facilitate emissions trading, would also prove to be

its ruin because this action catalyzed a series of high profile events that would ultimately uncover several unfavorable program liabilities that had been festering under NJDEP's complacency. The public comment period required by the conditional approval prompted joint written comments from the New Jersey Chapter of the Sierra Club and PEER to EPA's IG.

Those formal written comments itemized the two group's concerns regarding EPA's proposed approval despite "numerous cautionary findings by the Inspector General that such programs may be deeply flawed and would pose a hazard to public health." In addition, the groups collectively claimed that facilities "used this never-approved program both to generate credits and use them to demonstrate 'compliance' with the Clean Air Act's requirements" (Ruch and Wolfe, 2001).

The IG responded to the concerns of PEER and New Jersey's Sierra Club by initiating an investigation in 2001 that focused on the emissions trading programs launched in New Jersey and Michigan. The IG sought to ascertain the following:

> -- Whether there was an adequate basis for EPA's proposed approval of selected OMT programs.
>
> -- Whether EPA-approved emissions quantification protocols were used and if accurate, reliable data under lied OMT trades in these programs.
>
> -- The extent of EPA and state compliance assurance, enforcement, and oversight activities relative to OMT trades (Chan, 2002).

The IG was clearly interested in determining the validity of DER credits in New Jersey, stating that "quantification was one [concern] that [environmental groups] raised and that we intend to pursue" (Nussbaum, 2002). That focus proved to be warranted as the IG found that "data quality objectives were not consistently used to minimize the risk

of invalid trades in the 84 trades we [IG] reviewed in New Jersey and Michigan" (EPA, 2002).[18] The IG also confirmed something that was already widely known in the state -- that no EPA or state approved protocols were used during the calculation of credits.

However, the IG's finding that had the most significant impact on the OMET program was not something initially targeted by the investigation. During the course of the review, EPA inspected the trades to which PSEG had been a party and "alleged [that the utility had] violated [New Source Review] requirements by modifying two plants without obtaining required permits that would have established lower compliance levels. With lower levels, these plants' emissions reductions credits would not have been as great as initially claimed." Another utility, Conectiv, was found to have used "cooler, off season ozone credits to meet the warmer, more polluted, ozone season requirements," a violation that the IG claimed NJDEP could have detected if the department had been reviewing program data (EPA, 2002).

Federal officials and PSEG reached a settlement in January 2002 in which the utility company retired roughly 18,600 tons of DER credits valued at more than $16 million, a fine according to one respondent that was rather insignificant, since the credits were never verified by the government to be genuine in the first place (EPA, 2002). The larger problem stemming from the settlement, though, related to the impact that this agreement would have on the existing DER market. The removal of PSEG's credits significantly reduced the number of available in the market and limited the supply of credits that companies could purchase to stay in compliance with technical standards (Twyman, 2002a). This reduction of DER credits, combined with the closure of the

program's credit registry at the end of 2001 due to the contractor's pulling out of the program, create a tumultuous situation.

The final exam that the OMET program would ultimately fail was the evaluation by then-new NJDEP Commissioner Campbell. According to Campbell, a former Clinton-administration environmental official and Region 3 administrator, the settlements resulting from the IG investigation "highlight[ed] the need to re-evaluate New Jersey's failed emissions trading program" to make sure communities were not being short-changed (Twyman, 2002a). That re-evaluation led Campbell to ask EPA to hold off on the final approval of the state's SIP in May 2002 with the hope that NJDEP officials would substitute the OMET program with a more "workable" alternative (Samuelsohn, 2002). That search lasted only four months before Campbell concluded that the OMET program had failed and had hurt the state's effort to reduce air pollution, while other environmental advocates labeled the program "an environmental con game that did not work (Mansnerus, 2002).

5.4 Conclusions and Recommendations

As pointed out by one respondent, the experience garnered during New Jersey's emissions credit trading program highlights a potential misconception over the conjoining of market mechanisms and environmental policy -- that market-based solutions can independently solve environmental problems, or, more appropriately for the OMET program, provide industry with an alternative method of regulatory compliance. Open market trading pushed the regulatory envelope in that the state delegated the necessary tasks associated with credit trading to the private sector in an entirely unprecedented

manner. The New Jersey State Legislature and NJDEP simply overestimated the public's tolerance for the abrogation of government oversight in the conduct of environmental management.

The limit of that tolerance was ultimately violated by the absence of real safeguards and numerical targets essential to achieving environmental improvements. The need for an environmental goal, as pointed out by EPA's IG, was especially warranted in the OMET program to confirm that the program provided emissions reductions equivalent to those achievable under the prevailing system of technical standards (EPA, 2002). Combined with the questionable manner that NJDEP administered the program, one can easily assert that prolonging the OMET program as a regulatory option in the state could only result in poorer air quality and an increased incidence of public health hazards.

It is therefore not surprising that the feedback collected in this study on how to improve the OMET program focused on conservative means to employ market-based policies such as OMT. Recommendations included the creation of significant oversight and the need to begin an OMT program with a small number of participants to build confidence in both the regulatory agency and the public that a worthwhile and well-intended program is in place. Moreover, an effective emissions trading program requires a strict enforcement program and regulatory authorities should actively investigate and confirm the validity of a sufficient number of DER credits to ensure that real emission reductions are taking place.

To avoid concerns regarding the prominence of private parties in open trading, the need for accurate quantification protocols and agreed upon guidance must be the core of

any OMT program. Since regulatory authorities must devote considerable effort to developing protocols for every industrial application involved in credit generation, they should prioritize those operations and reduction techniques that are most prevalent in industry and have the capacity to produce the largest number of credits due to the sheer volume of source emissions. Those protocols should ideally be approved by either EPA or the appropriate state agency, or both, before credit generation can take place. For smaller emissions sources where approved quantification protocols are not justified, environmental authorities must develop guidance that is agreeable to both state and federal officials. Facilities subject to such guidance should be the focus of enforcement audits to confirm those facilities are following appropriate procedures for generating credits.

The real value of OMT, though, should not be predicated upon the volume of emissions reductions that are taking place. Open market trading represents a rare regulatory tool that can spur smaller and more numerous businesses to find innovative, rewarding ways to reduce emissions. As Ayres (2000) points out, "with more accurate information about the costs of reaching pollution control goals, policymakers can make more informed decisions with respect to such goals." The advantage of promoting and learning from that innovation justifies the continued experimentation with OMT as an option for achieving cost-effective pollution reduction targets.

END NOTES

[1] Although netting is similar to the bubble method, it relates only to sources undergoing expansion or modification that normally require stricter lowest achievable emissions reduction standards associated with new operations. The netting effect circumvents that requirement by using offsets to stabilize aggregate emissions.

[2] The equimarginal principle says that if multiple sources are trying to achieve a common goal, and you want to minimize the total cost of achieving that goal, distribute production in a way that will equalize the marginal costs between the multiple sources.

[3] The first phase took effect in 1995 and covers 111 large existing power plants in 21 states. The second stage, starting in 2000, applies to all power plants within the 48 contiguous states and the District of Columbia.

[4] The OTR is a federally designated area identified in the Clean Air Act Amendments that receives policy guidance from the Ozone Transport Commission (OTC). The OTR includes portions of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, and the District of Columbia, and is distinguished by significant interstate transport of emissions.

[5] Restriction plans seek a 35 percent reduction in NO_x emission levels against levels in the inner zone and a 45 percent reduction in the outer zone. Additionally, Inner and outer zone sources must reduce to 25 percent of 1990 emissions and northern zone sources to 45 percent after 2003 (Farrell, Carter and Raufer, 1999).

[6] Ozone is the product of nitrogen (NO_x) and volatile organic compounds mixing in the atmosphere on hot and sunny days and is the primary component of smog.

[7] EPA does not have the authority to develop a NO_X interstate trading system; therefore, attempts to do so must be done by enticing state-level environmental agencies to become members of it to diversify their overall air quality management program.

[8] The "SIP Call" merely indicates the method EPA uses to control regional ozone throughout the eastern US. With the authority to force states, or "call" upon them, to revise their SIPs after new insights to air quality, EPA can specify the total reduction necessary at the state-level, but it cannot mandate emissions limitations at the source level. As a result, EPA can persuade states to utilize market-based systems to meet any new emissions budgets set by the federal government as more traditional regulations would be extremely unpopular.

[9] Michigan actually enacted an open market emissions trading program in 1986, but was forced to rework significant parts of it following release of the 1995 open market trading rule.

[10] Similar to SO_2 and particulates, ozone also provided evidence that other air pollutants were present in the lower atmosphere. For instance, the concentration of ozone reflected the presence of photochemical oxidants (VOCs and NO_X), also known as ozone precursors, needed for ozone formation. As a result, any regulatory action seeking to reduce the concentration of ozone would also require cutbacks in ozone precursor emissions.

[11] The automobile emission inspection program remained a part of the Division of Motor Vehicles and was overseen by the state Attorney General.

[12] In 1989, New Jersey operated 150 air monitors at 75 locations throughout the state. Twenty-eight of those monitors were part of the continuous monitoring network capable of measuring ambient concentrations of ozone and were stationed in every county except Sussex (Stansfield, 1989).

[13] Reformulated gasoline is fuel blended to burn cleaner and reduce smog-forming and toxic pollutants in automobile emissions.

[14] The savings clause of the 1990 CAAA provides that if a control requirement is required to be adopted by an order, settlement agreement, or plan in effect before the date of enactment of the 1990 Amendments, the control requirement may not be modified unless the modification insures equivalent or greater emission reductions of the relevant air pollutant.

[15] Communications between EPA Region 2 EPA and NJDEP officials were obtained through Freedom of Information Act Requests.

[16] Based on transaction costs in 1997 in which PSEG sold 63 tons worth of DER credits to a specialty paper manufacturer and to the South Jersey Gas Company at prices ranging from $950-$1,250 a ton (Twyman, 2002b).

[17] In the three years leading up to 1999, companies in four of the state's most heavily urbanized counties earned almost 25,000 credits under the OMET program. However, only 30 of those credits were purchased (Regan, 1999).

[18] Data quality objectives are "explicit statements that describe the type, amount, and quality of data to support environmental regulatory decisions. According to EPA's data quality objectives order (Order 5360.1), five attributes should be known before the data are used for regulatory decisions. These include quantitative measures of precision, accuracy, completeness, qualitative statements regarding data representatives, and comparability" (USEPA, 2002).

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