



## NORTHEAST STATES FOR COORDINATED AIR USE MANAGEMENT (NESCAUM)

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To: All Interested Parties  
From: Michael J. Bradley  
Executive Director, NESCAUM  
Date: December 12, 1993

Subject: Final Report for the Emission Reduction Credit Demonstration Project, Summer 1993

During the summer of 1993, a number of companies, environmental groups, and government regulators worked together to discuss and resolve important questions concerning the creation of emission reduction credits (ERCs). The goal was to determine whether it is possible to accurately quantify voluntary mobile source and stationary source emission reductions of VOCs and NOx, the precursors to ground-level ozone.

During the course of the project, the private sector participants reduced VOC emissions by 142 tons and NOx emissions by 3,387 tons, contributing to lower than anticipated ambient ozone levels.

Although participants in the ERC Demonstration Project (Demonstration Project) did not initially set out to resolve how companies could use ERCs in an emission trading program, they did discuss a number of questions related to use. They also discovered that it is often difficult to completely separate ERC creation and use issues.

The participants in this task have overcome many differences to resolve fundamental concepts surrounding the creation of emission reductions. The project, its results, and the conclusions and recommendations of the project participants are presented in the project's report (enclosed).

Briefly, the participants concluded:

- Even though uncertainties exist in the accuracy of current compliance data and emission inventories, uncertainty is not inherent in any particular regulatory approach. Rather, it represents a reality to which any regulatory approach must respond.
- Protocols for the emission reduction strategies were developed among all participants concurrently and/or retrospectively with the implementation of the strategies. This approach allowed for simpler and more accurate accounting of the emission reductions than the prospective approach that is more commonly used by regulators.
- The definition of "surplus" emission reductions will vary from state to state depending upon each state implementation plan.

MICHAEL J. BRADLEY, EXECUTIVE DIRECTOR  
129 PORTLAND STREET  
BOSTON, MASSACHUSETTS 02114  
TEL. (617) 367-8540 FAX (617) 742-9162

It is worth noting that the conclusions and recommendations are the result of the consensus-based process that was used throughout the project. The fact that the participants recommend that the emission reductions from this project be "creditable" and that further work be undertaken to evaluate emission trading, reflects the high quality of the working relationship that has resulted among the participants over the course of the past six months.

I hope that you will find this report interesting and useful. I believe that the quality of both this report and the process which produced it is representative of a high level of effort and commitment to achieving environmental goals in an economically sound manner.

# **Emission Reduction Credit Demonstration Project**

Summer 1993

## ***Final Report***

### **Participants**

American Lung Association of New Jersey  
Boston Park Plaza Hotel and Towers  
Chevron Company  
Clean Air Action Corporation  
Conservation Law Foundation  
Hoffmann-La Roche, Inc.  
Massachusetts Department of Environmental Protection  
Massachusetts Division of Energy Resources  
Massachusetts Executive Office of Environmental Affairs  
Massachusetts Executive Office of Economic Affairs  
Medical Academic and Scientific Community Organization, Inc. (MASCO)  
Merck & Company, Inc.  
Mid-Atlantic Energy Project, Rutgers University  
New England Electric System  
New Jersey Department of Environmental Protection and Energy  
Northeast States for Coordinated Air Use Management (NESCAUM)  
The PENJERDEL Council  
Pennsylvania Department of Environmental Resources  
The Pennsylvania Resources Council  
Philadelphia Department of Public Health  
Public Service Electric & Gas  
Sun Company

# ***EXECUTIVE SUMMARY***

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## ***Overview***

- Significant reductions in air pollution, including 142 tons of volatile organic compounds (VOCs) and 3,387 tons of oxides of nitrogen (NOx) were achieved last summer as a result of activities undertaken during the Emission Reduction Credit Demonstration Project (Demonstration Project).
- Twenty-two organizations across three states participated in the Demonstration Project, developing 15 voluntary emission reductions strategies. These actions proved that voluntary action by industry, with the cooperation of regulators and peer review (including environmental advocates), can contribute to reducing air pollution and improving public health.
- Participants regard the Demonstration Project, undertaken as a good faith effort by members of the environmental, regulatory and private sector communities, as successful in achieving its four primary goals:
  - To achieve reductions in ozone pollution earlier than, or in excess of, existing state and federal environmental requirements, resulting in short-term and long-term air quality improvements;
  - To create protocols that document and quantify the emission reductions from each of the strategies and that are acceptable to businesses, environmental advocates, and government regulators;
  - To demonstrate that innovative, market-based solutions to reducing air pollution can be “real, quantifiable, surplus, permanent and enforceable” and can be documented at least as accurately as traditional approaches; and
  - To establish through this project a mechanism for building future emission trading systems.
- The Demonstration Project’s significant reductions in air pollution, which were not required by law and may not have occurred without this project, were the result of the voluntary investment of several millions of dollars by the project’s private sector participants.
- The Demonstration Project’s activities also included a trade of emission reduction credits (ERCs), in accordance with a state’s air quality law. Though not large in its environmental or economic impact, the trade demonstrated, in the spirit of the project, that emission reduction credit trades can be successfully completed when industry, regulators and environmental groups work toward a common purpose.

## ***Approach***

- Representatives of state air quality control agencies, other state agencies, public utilities, the business sector, and environmental and business advocacy groups were recruited specifically to ensure that the results of the project would be considered valid by as wide an audience as possible.
- To develop a consensus-building process, the group held an organization meeting to outline the guiding principles and goals of the project.
- An agreement highlighting the Demonstration Project's principles and goals was developed and signed by all participants.
- A set of emission reduction strategies was proposed, agreed upon, and implemented during the 1993 summer ozone season of June 15 through September 15.
- Protocols and procedures were developed to demonstrate to all parties that the reductions claimed were, in fact, achieved.
- The following report was produced to review the implemented strategies, summarize results and conclusions of the participants, and identify recommendations for areas that remain to be resolved or explored.

## ***Results***

- The emission reduction strategies implemented as part of this project yielded 3,387 tons of emissions of NO<sub>x</sub> reduced and 142 tons of emissions of VOCs reduced for the period from June 15, 1993 through September 15, 1993, averaging 37 tons per day of NO<sub>x</sub> and 1.5 tons per day of VOCs reduced during the ozone period targeted by the Demonstration Project. The businesses, their strategies, and the resulting emission reductions are summarized in the table on the following page. Values in italics represent reductions that (1) will occur if the strategy is implemented consistent with the protocol, and (2) occurred outside of the summer time period. All values are the result of calculations that may be affected by changes in a state's SIP or other relevant regulations.

*Businesses, Emission Reduction Strategies, and Emissions Reduced.*

<i>Company</i>	<i>Strategy</i>	<i>Emission Reductions (in tons)</i>	
		<i>NOx</i>	<i>VOCs</i>
Boston Park Plaza Hotel & Towers	Demand Side Management	0.12	
Chevron USA Products Division	Leak Detection and Repair		0.9
Clean Air Action Corporation	Pike Pass	56 <sup>1</sup>	168 <sup>1</sup>
	Reid Vapor Pressure Repair	0.44	21.48
	VOC Trade: Reformulated Fuel	0.41	20.03
Hoffmann-La Roche	Leak Detection and Repair		44.5
MASCO	Employee Trip Reduction	0.02	0.02
Merck & Company, Inc.	Leak Detection and Repair		2
New England Electric Systems	Demand Side Management	161	
Public Service Electric & Gas	Fuel Switching	2,724	
	Selective Non-Catalytic Reduction	454	
	Demand Side Management/ Standard Offer	47.3	
	Lawnmower Scrappage		0.03
Sun Company	Reid Vapor Pressure Reduction		74.8
	Vehicle Scrappage	3.68 <sup>2</sup>	13.49 <sup>2</sup>
<b>Total Emission Reductions</b>		<b>3,387</b>	<b>142</b>

### *Conclusions*

The Demonstration Project provided valuable new information that has not been developed in the traditional command and control environment. This new information includes:

- Emission Inventory and Emission Reduction Measurement
  - Existing compliance data and emission inventories are not as accurate as thought by some of the participants.
  - The issue of measurement uncertainty is inherent in existing regulatory efforts and, therefore, will affect almost every step of the ERC creation process.
  - Because sources do not always emit at a fixed rate, calculating emission reductions based upon a fixed rate could result in over- or understating the ERCs.
- Protocol Development
  - The protocols developed for this project are at least equal, if not superior, to existing requirements for compliance determination and state emission inventories.

- The process of accounting for ERCs is simpler and more accurate if performed retrospectively, rather than prospectively.
- In utility grids, dispatch changes from one source to another need to be measured in order to distinguish actual emission reductions from shifting demand.
- In developing the protocols in a manner consistent with the project goals listed above, participants in the Demonstration Project relied on the existing EPA definitions of “real” and “quantifiable.” However, EPA definitions of “permanent” and “enforceable” in its 1986 Emissions Trading Policy were found by the participants to require modification as they apply to the issues of credit creation which were the focus of this project.
- ERCs and State Implementation Plans
  - A thorough understanding of the state implementation plan in affected states is necessary to establish the appropriate definition of “surplus” emission reductions, and therefore which emission reductions are creditable.
- Environmental Benefit
  - The reductions of VOCs and NO<sub>x</sub> that occurred as a result of this project demonstrate a clear benefit to the air and to the public health.
  - This project has shown that a market-based approach to reducing emissions can provide an incentive for businesses to reduce emissions beyond required levels. The additional reductions created through the market system contribute to reaching ozone attainment “as expeditiously as practicable,” an important qualitative requirement of the CAA.

## ***Recommendations***

- The process of protocol development led to the recognition by the participants that EPA’s 1986 definitions of permanent and enforceable focus primarily on regulatory techniques to ensure the validity of credit use. In the context of credit creation, however, use of each of these terms requires a redefinition by EPA in order to be meaningful, and to evaluate possible acceptable combinations of credit creation and use which are consistent with the intent of encouraging innovative, reasonable actions to reduce emissions in a manner which maximizes environmental integrity. The issues of credit use are a function of the kind of credit created and will be explored more fully in Phase II of this project.
- The emission reductions calculated using these protocols meet EPA definitions of real and quantifiable, and the group’s definitions of permanent and enforceable. To the extent that these reductions are determined by states to be surplus, it is the recommendation of the Demonstration Project participants that the emission reductions created during this project be considered creditable by states and the U.S. Environmental Protection Agency. To encourage early emission reductions, reductions achieved through this project, and determined by states to be surplus, should be eligible for credit certification in states with existing or developing trading programs. Again, the potential use of credits will be examined in Phase II of this project.

- The project participants encourage states to develop and implement emission banking and trading programs that result in early surplus reductions using cost-effective measures. ERCs generated through such programs should be bankable and usable to meet compliance requirements as long as the rate of ERC use is consistent with SIP requirements.
- Trading programs implemented prior to the establishment of final attainment ozone reduction measures should be viewed as interim programs that operate within the known constraints of RFP, RACT and other SIP requirements. After attainment needs are identified, states should adjust emission trading programs to conform with the new conditions, if necessary.
- Because of the experience and success shared by the participants during the course of this project, the group recommends that a follow-up project be undertaken during 1994. This second project would include five major goals.
  - Examine and expand potential uses of ERCs.
  - Examine issues concerning the design of ERC trading programs.
  - Develop audit/enforcement protocols to document ERC use.
  - Examine the issues related to interstate trading and develop appropriate draft procedures to facilitate such trades.
  - Expand the 1993 Demonstration Project:
    - Increase the number of participating organizations,
    - Increase the number of participating states, and
    - Increase the types of strategies implemented.

*Additional copies of this report may be obtained by contacting:*  
 NESCAUM  
 129 Portland Street  
 Boston, MA 02114  
 (617) 367-8540



# Emission Reduction Credit Demonstration Project

## Summary of Emission Reductions

Company	Strategy	Reductions (total tons)									
		NOx			VOCs			CO			
		summer 93	other	potential	summer 93	other	potential	summer 93	other	potential	
	Boston Park Plaza Hotel & Towers	0.12									
	Window Replacement										
	Chevron USA Products Company				0.90						
	Leak Detection and Repair										
	Cleart Air Action Corporation										
	Electronic Pike Pass	0.44 b		56.0 a	21.5 b		158.0 a	22.9 b		16,122.0 a	
	RVP Reduction	0.41			20.0			21.4			
	Use of VOC Credits for Reform. Gasoline										
	Hoffmann-La Roche				44.5						
	Leak Detection and Repair										
	MASCO	0.02	0.06 c		0.02	0.07 c					
	Employee Trip Reduction										
	Merck & Co., Inc.				2.0	6.0					
	Process Reductions										
	New England Electric System	161.0 d	232.0 e								
	DSM										
	Public Service Electric & Gas										
	Mercoer 2 Fuel Switch w/SNCR	454.0									
	Hudson 2 Fuel Switch	2,724.0			0.03						
	Electric Lawnmower Exchange	0.002									
	DSM Standard Offer	47.3 f									
	Sun Company		3.7 g			13.5 g			107.9 g		
	Accelerated Vehicle Retirement				74.8 h	71.1 i					
	Field Vapor Pressure Reduction										
Totals		3,386.9	235.7	56.0	142.2	90.6	168.0	21.4	107.9	16,122.0	

Notes:

- a -- assumes full implementation of Pike Pass in both MA and NJ
- b -- not included in final total (presented to illustrate reductions from low-RVP alone; totals indicated in VOC reformulated trade represent actual net reductions)
- c -- annual totals minus ozone season totals
- d -- preliminary estimate; final total will be determined at end-of-year filing with MA DPU
- e -- includes preliminary estimate of 1993 annual totals and approved 1992 totals (minus 1993 ozone season estimate)
- f -- net reductions; ERC credit filing may be lower dependent on New Jersey DSM SIP ruling
- g -- total annual reductions; actual scrapage operation took place in October 1993, and formal ERC filing should look forward to 1994 fleet to determine amount of ERC
- h -- assumes manufacture and distribution dates beginning 5-13-93 and ending 8-15-93
- i -- non-ozone season reductions would need to be recalculated based on updated monthly ambient temperature and MOBILE5a.1 time inputs for formal ERC filing

**Emission Reduction Credit Demonstration Project**  
**Strategy Summaries**

Boston Park Plaza Hotel & Towers	Implemented a demand-side management strategy by installing highly energy-efficient windows throughout the hotel.
Chevron Company	Instituted an enhanced leak detection and repair program to track and repair leaks in pumps and valves to attain leak levels below what is currently required by state regulations.
Clean Air Action Co.	<ol style="list-style-type: none"> <li>1. Undertook gasoline Reid vapor pressure reduction including the estimation of the emissions improvement during distribution and storage in addition to reduced vehicle emissions.</li> <li>2. Initiated a trade allowing the use of VOC credits from low RVP gasoline to offset gasoline with higher RVP.</li> <li>3. Designed a strategy to create ERCs from an automated toll-collection system.</li> </ol>
Hoffmann-La Roche	Implemented a leak detection and repair program involving fugitive-emissions monitoring and capture.
MASCO	Established acceptable documentation for a vanpool/carpool system to identify net emission reductions.
Merck & Co. Inc.	Implemented several emissions reduction initiatives, including process chemistry changes, fugitives monitoring and spot repair, solvent substitution, and installed process monitoring and vapor recovery equipment in most of its manufacturing operations.
New England Electric System	Undertook demand-side management initiatives that included residential, commercial and industrial energy savings.
PSE&G	<p>Implemented four emission reduction strategies:</p> <ol style="list-style-type: none"> <li>1. Utility seasonal fuel-switch</li> <li>2. Utility selective non-catalytic reduction (SNCR)</li> <li>3. A lawnmower scrappage program</li> <li>4. A 150 MW energy conservation program (DSM).</li> </ol>
Sun Company	<p>Completed two strategies:</p> <ol style="list-style-type: none"> <li>1. A car scrappage program</li> <li>2. Reduced RVP gasoline.</li> </ol>

**Emission Reduction Credit Demonstration Project**  
**Contact List**

	<i>Organization</i>	<i>Contact</i>	<i>Phone</i>
1.	American Lung Assoc. of NJ	Robert Corso Linda Stansfield	(908) 687-9340
2.	Boston Park Plaza Hotel	Liz Kay	(617) 424-0235
3.	Chevron USA Products	Eric Schneider	(215) 339-7364
4.	Clean Air Action Corporation	Ben Henneke	(918) 592-0300
5.	Conservation Law Foundation	Robert Russell	(617) 350-0990
6.	Hoffmann-La Roche Inc.	Jack Kace Pam Fears	(201) 235-3774 (201) 235-7652
7.	MA Dept. of Env'l. Protection	Barbara Kwetz	(617) 292-5593
8.	MA Div. of Energy Resources	Howard Bernstein	(617) 727-4732
9.	MA Exec. Office of Econ. Aff.	Barbara Kessner	(617) 727-8380
10.	MA Exec. Office of Env'l. Aff.	Sonia Hamel	(617) 727-9800
11.	MASCO	Robert Tassinari	(617) 632-2310
12.	Merck & Co., Inc.	Dorothy Bowers	(908) 423-6860
13.	Mid-Atlantic Energy Project	Daniel Rosenblum	(201) 648-5695
14.	NESCAUM	Michael J. Bradley	(617) 367-8540
15.	New England Electric System	Leo Sicuranza	(508) 366-9011
16.	NJ Dept. of Env'l. Protection	John Elston Nina Rizzo	(609) 292-6710 (609) 292-7840
17.	The PENJERDEL Council	Gretchen Toner Scott Allocco	(215) 972-3949 (215) 440-7021
18.	PA Resources Council	Patricia Imperato	(215) 565-9131
19.	PA Dept. of Env'l Resources	Jim Rue	(215) 832-6012
20.	Philadelphia Air Management	Robert Ostrowski	(215) 823-7584
21.	Public Service Electric & Gas	Eric Svenson Neil Brown	(201) 430-5857 (201) 430-6017
22.	Sun Company	Tony Ippolito Bud Davis	(215) 977-3175 (215) 977-3485

# **Emission Reduction Credit Demonstration Project**

## ***Fact Sheet***

***Participants:*** 22 organizations in three states: Massachusetts, New Jersey, Pennsylvania

- Voluntary participation by the three primary stakeholder groups: the private sector, government agencies, environmental advocacy groups
- Nine companies implemented 15 emission reduction strategies, including demand-side management, low RVP, vehicle and lawnmower scrappage, employee trip reduction, selective non-catalytic reduction

***Rationale:*** Focus was on understanding and evaluating emission reduction strategies and their potential for credit creation; many aspects of credit use and trading were discussed; however, issues beyond credit creation were largely set aside for a separate effort

***Approach:*** Consensus-based approach to developing protocols that document and quantify the implemented emission reduction strategies

***Objectives:***

- To achieve reductions in ozone pollution earlier than, or in excess of, existing state and federal environmental requirements, resulting in short-term and long-term air quality improvements;
- To create protocols that document and quantify the emission reductions from each of the strategies and that are acceptable to businesses, environmental advocates, and government regulators;
- To demonstrate that innovative, market-based solutions to reducing air pollution can be “real, quantifiable, surplus, permanent and enforceable” and can be documented at least as accurately as traditional approaches; and
- To establish through this project a mechanism for building future emission trading systems.

***Results:*** Reductions of over:

- 140 tons of volatile organic compounds (VOCs)
- 3,380 tons of oxides of nitrogen (NO<sub>x</sub>)

***Recommendations:***

- Examine and expand potential uses of ERCs.
- Examine issues concerning the design of ERC trading programs.
- Develop audit/enforcement protocols to document ERC use.
- Examine the issues related to interstate trading and develop appropriate draft procedures to facilitate such trades.
- Expand the 1993 Demonstration Project:
  - Increase the number of participating organizations,
  - Increase the number of participating states, and
  - Increase the types of strategies implemented.

## **Emission Reduction Credit Demonstration Project, Phase II**

### ***Fact Sheet***

***Concept:*** Provide significant real-world experience with emission trading and, as a result, crucial guidance to states developing emission trading rules which are acceptable to a wide range of interests.

***Goal:*** Build upon the credit creation protocols produced in the ERC Demo Project (Phase I) by creating two additional types of documentation for ERC trades: ERC use procedures and audit protocols. Together, these three types of ERC documentation will provide the information necessary for all stakeholders (private companies, state and federal regulators, and environmental groups) in ERC trading to access and understand the impacts of an ERC trade.

***Rationale:*** The existence of these three types of documentation will minimize the regulatory burden required to ensure the environmental integrity of ERC trades and will provide industry with the level of certainty necessary to invest in ERC trading. As a result, environmental goals will be met or exceeded in a manner which provides maximum compliance flexibility and lower cost to the private sector.

***Approach:*** Continuation of the public-private partnership established in Phase I will entail a consensus-building process to develop and evaluate trades and the appropriate documentation for trading to be accepted by all participants.

***Objectives:***

1. The development of an agreement which outlines both the conceptual scope of trades for the project and their respective audit procedures;
2. The selection of specific trades to be evaluated; the development of ERC use procedures and audit protocols for ensuring that the trades meet state requirements, EPA's EIP guidance, and are federally enforceable;
3. The production of a report for use by states in the development of emission trading programs which includes the use procedures and audit protocols, and the recommendations derived from considering the individual trades in a larger programmatic context;
4. The implementation of a 1994 Summer Demonstration project which includes new ERC creation strategies and protocols covering a wider geographic area and including new participants, as well as new ERC trades with ERC use procedures and audit protocols.