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# Implications of the Clean Air Act Amendments for the Northeast

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*The Clean Air Acts Amendments (CAA) of 1990 continue to affect public policy at the federal, state and local levels of government. At the PURE '93 Conference last January, "Alternatives to Traditional Regulation," one panel explored the implications of the CAA on the Northeast. Joseph A. Belanger of the Connecticut Department of Environmental Protection provided this assessment of Title I of the CAA, particularly with respect to ozone attainment requirements.*

*by Joseph Belanger  
Connecticut Department of Environmental Protection*

### Introduction

Title I of the Clean Air Act Amendments of 1990 concerns attainment and maintenance of national ambient air quality standards. In the Northeast, the major attainment issue is to meet the ozone standards. Within the ozone attainment issue, there are five central points about the Clean Air Act Amendments of 1990 that should be addressed:

- What ozone "attainment" is, and what it means for the Northeast.
- The controls that will be required for utilities, particularly with regard to nitrogen oxides (NO<sub>x</sub>).
- The scientific implications of NO<sub>x</sub> controls and attainment, and how these shape the problem in most of the Northeast, and to some extent in Maine.
- What some of the states and the Ozone Transport Commission, which covers the eleven northeastern states, a portion of Virginia and the District of Columbia, are doing.
- The issues that are raised by market- based incentives, such as trading of NO<sub>x</sub> offsets.

### The ozone situation in the Northeast

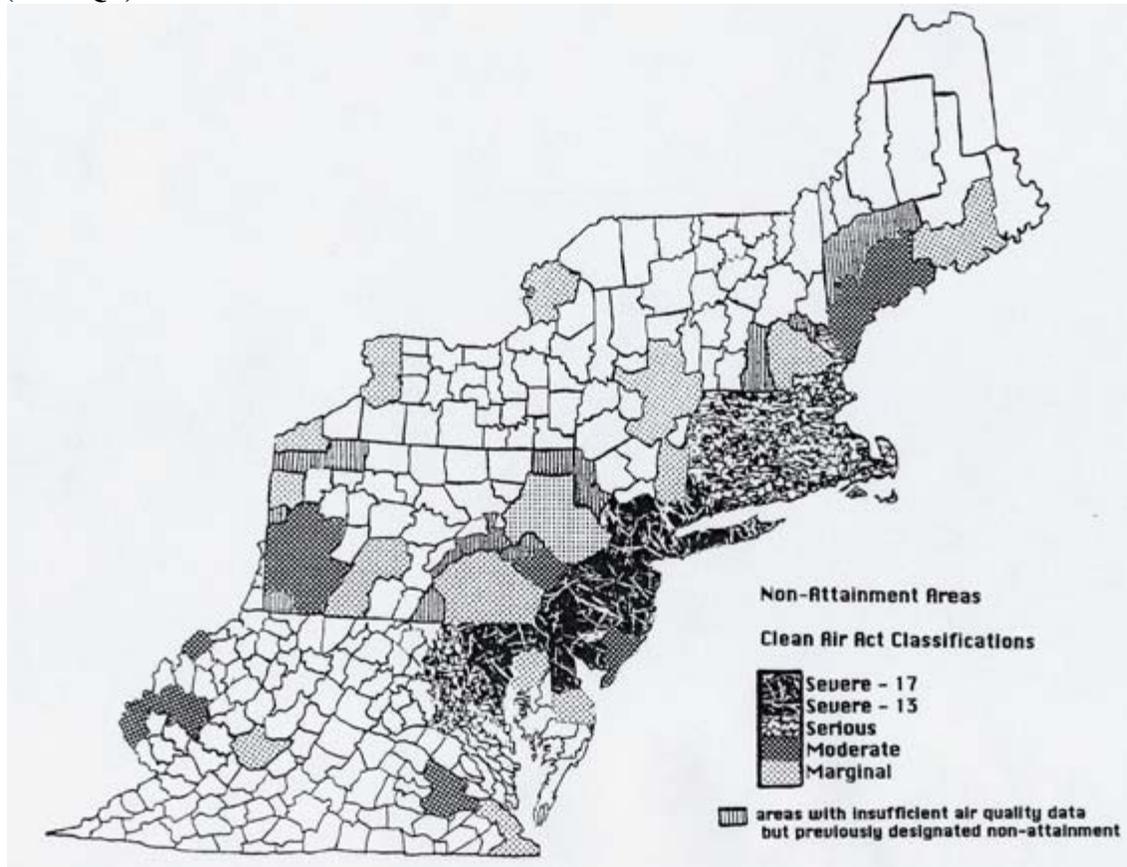
There are four ozone non-attainment classifications within the New England region, which vary from severe in southwest Connecticut to marginal in parts of New Hampshire and Maine. The target dates for ozone attainment range from 2007 in the severe areas to 1993 for the marginal ones. Inasmuch as ozone is a problem that, to a large degree, results from transported pollutants, the ability of states such as Maine to reach attainment by the earlier dates, while states such as Connecticut and Massachusetts are on extended timetables, could be questioned.

Part of Maine is in the lowest NO<sub>x</sub> classification area, so it has until 1993 to attain ozone compliance. Southwest Connecticut has until 2007, and the excellent pollutants from Connecticut will be traveling up the coast and over Massachusetts and Maine.

Figure 1 provides a graphical summary of the non-attainment status of all areas in the Northeast. As you can see, the most severe problems occur in a region that extends from New Jersey to

southwest Connecticut. Most of southern New England is in the "moderate" category. The southwestern tip of Maine is in the "moderate" category, while much of the central coastal region is in the "marginal" category.

**Figure 1: Areas Designated as not Meeting the National Ambient Air Quality Standard (NAAQS) for Ozone**



### *Title I NO<sub>x</sub> provisions and utilities*

Title I of the Clean Air Act Amendments has many provisions relating to specific emission reductions requirements, control of emissions growth and attainment planning. Three regulatory strictures arise from the treatment of oxides of nitrogen as an ozone non-attainment pollutant.

These are:

- A requirement that any new major stationary source of NO<sub>x</sub> create or procure emission reductions that offset its new emissions in an amount greater than 1 to 1. These are generally referred to as offsets.
- A requirement that existing major sources of NO<sub>x</sub> install "reasonably available control technology"(RACT).
- The implicit requirement that NO<sub>x</sub> emissions be reduced below the RACT levels as a part of the strategy for reaching attainment.

Each of these requirements provides utilities and their regulators both with challenges and with opportunities. For example, the offset requirement, which essentially establishes a cap on the level of total emissions from large sources, will require any newly-permitted power supply, whether an independent power producer or a utility-owned facility, to acquire emissions reductions or credits at least 1.15 times its total NO<sub>x</sub> emissions. These credits may be difficult to find, and they will also represent a cost in addition to the cost of the higher level of controls that are required by the Clean Air Act Amendments. But this requirement is also an opportunity, because sources other than power plants will be required to obtain offsets. Existing power plants that have a large potential to reduce emissions may be a source of the emission credits for major new industrial plants, if the appropriate mechanisms and incentives are established.

The RACT requirements probably provide significant challenges because the general requirement is that existing sources reduce NO<sub>x</sub> emissions levels by approximately 40 percent by 1995. Northeast States for Coordinated Air Use Management (NESCAUM) has developed proposed emissions limits for various types of utility plants and each of the states is adopting its own regulations to implement the program.

### **EPA's ozone studies**

NO<sub>x</sub> regulation will also affect utilities in the second stage of NO<sub>x</sub> control. There has been no consensus on the role that NO<sub>x</sub> plays in the ozone problem, and therefore no agreement on the extent to which it needs to be controlled. The EPA, along with the Ozone Transport Commission, is trying to determine what level of NO<sub>x</sub> reductions, as compared to volatile organic compounds (VOCs) reductions, will be required. Efforts to reduce VOCs would fall largely on some industrial applications and would affect the motor vehicle sector. But the utility sector would largely escape, because utilities are not big VOC emitters.

Three sets of studies have been done on the role of NO<sub>x</sub> in ozone by the Environmental Protection Agency. First, the EPA examined the Clean Air Act requirements to determine if controls should extend to Ohio and the West. EPA modeled this extension, and discovered that it did not help. EPA then looked at various across-the-board percentage reductions in the Northeast. This was really a sensitivity analysis to determine where we should apply controls. This approach has started to give some direction. Elimination of a lot of volatile organic compounds -- gasoline vapors and car pollutants and the emissions from industrial coating operations, such as paint -- does not seem to make much difference. These reductions did not significantly improve the situation in the Northeast. On the other hand, if the focus of control is on NO<sub>x</sub>, then there is a very significant improvement. This study was very wide-scale and several caveats need to be placed on interpretation of these model results. The models are very gross and need refining. But they point to the need for NO<sub>x</sub>, rather than VOC, controls. The implication is that controls are required for those who burn a lot of fuel and for motor vehicles, because these are the two major sources of NO<sub>x</sub>.

But even when all of these controls that are required under the Clean Air Act Amendments are implemented -- the car programs, the industrial controls, and the RACT requirements -- problems still exist in southern Maine. Violations of the standard could occur even after implementing all that is required by the Amendments. More restrictive controls would probably

be necessary. Roughly a 75 percent emission reduction in NO<sub>x</sub> uniformly across all sources would bring much of the region into attainment and would solve the problems in southern Maine. However, controls in the areas of the Northeast states that already meet ozone standards have no effect. This would suggest a focus on just the non-attaining northeast corridor to determine if essentially the same results can be achieved by controls focused on the non-attainment areas rather than a 75 percent reduction across the board. This focused analysis tends to direct attention toward the electric utility sector, which is the major source of NO<sub>x</sub> in the Northeast. In Maine, some big industries, such as paper companies, will bear some of the burden of compliance.

### **Market mechanisms and the Ozone Transport Commission**

Given these various demands, the challenge is to provide mechanisms that allow the necessary reductions to be made in the most cost-effective manner and to assure that a new or expanding industry or business is able to find the necessary credits. The Clean Air Act Amendments encourage the use of market mechanisms to achieve these objectives.

There are rules in the Clean Air Act about when and how trades to offset emissions can occur. Basically, emissions from an area with a more severe air pollution problem can be traded for use in a less severe area. The air quality standard in the area in which it is used cannot be violated as result of that trade. And a trade requires more than a one to one offset. In a worse case (or the best, from the perspective of environmentalists), the ratio is 1.3 to 1.0. A firm that needs one hundred tons of emission rights would have to find 130 tons of emissions reduction somewhere else.

Emissions trading programs are being encouraged at the state level. Emissions trading is virtually impossible if each potential buyer must find potential sellers on an ad hoc basis. The transaction costs would be very high, and there would be difficulty in planning projects when it is unknown from where emissions will come. Without a market, there would be no incentives to create emission reductions in advance and to put them "in the bank." At the state level, there is an effort to establish a formalized trading program. Firms will have the opportunity as they implement the first (1995) stage of RACT to implement more efficient control devices than are necessary to achieve RACT. Such firms can put those savings in the bank for later use, or the firms can sell those savings to someone else. We are trying to develop that kind of market across all of the states, with help from the Ozone Transport Commission, so that interstate trading of credits may be possible.

The Ozone Transport Commission is very interested in the possibility of an emission credit trading program. Its goal is an interstate program that would allow the various states in the region (from northern Virginia through Maine) to trade NO<sub>x</sub> emission credits. This interest arises in part from the offset requirements that apply to all areas of the ozone transport region, attainment areas or not. Note that this differs from elsewhere in the country where attainment areas are exempt from offsets. And in part, the interest arises from the idea that a larger trading domain will result in a more robust market, lower costs, and an increased regional economic competitiveness. Of particular concern are the portions of states or entire states that are classified as attainment areas and that have limited existing sources from which to obtain credits and face

constraints on future development. States like Vermont have very few sources of these credits for a new industry that might try to locate there.

In addition to the issues raised by any trading program, such as environmental integrity, workability, and compatibility with federal and state regulation, interstate trading raises questions about the interstate economic effects of trading programs. Because of the legal, technical, and political complexities, the Ozone Transport Commission approach is cautious. It focuses on promoting state programs, on identifying those elements of state programs that need to be identical or similar to ensure compatibility, and on identifying the geo-graphic areas within which trading could take place given legal constraints and environmental and meteorological realities.

### **Implications for utilities and regulators**

None of these changes, of course, is without implications for utility regulators and utilities. Because utilities are a major source of NO<sub>x</sub>, they are prime candidates for offsets for new development. They are also prime candidates for the use of credits to comply efficiently with NO<sub>x</sub> RACT requirements, as when the scheduling of some of the necessary retrofits is best extended beyond the regulatory compliance date. The trading of credits might be used when compliance costs would otherwise be unreasonable because the remaining useful life of a facility would not justify the investment in control equipment. Averaging, or "bubbling," on a plant-wide, utility-wide or area-wide basis would be another way in which a trading system could result in lower costs. This is especially true in the context of long-range attainment plans, where the states have more flexibility in the approach they take.

The offset requirements and trading programs also raise a number of interesting questions for regulators, such as: How should the value of these credits be viewed when dealing with avoided cost determinations, demand-side management programs, and rate-making? The value of these credits may be \$2,000 to \$5,000 per ton initially. As emissions are further curtailed, these values will go much higher. What should electric utilities be expected to do to provide emission credits to facilitate economic development in a state? Should they be required to incur greater NO<sub>x</sub> reduction costs to provide credits that promote economic growth in their service area? Should utilities be required to sell credits on preferential terms to firms within their service territory? And most obviously, how will sales and purchases of credits be viewed in the context of reviews of prudence of business decisions?

### **Conclusions**

Given all these questions and problems, why should we pursue market approaches? Quite simply, we have no alternative. The offsets are required for economic growth. Attainment of clean air objectives is both desirable and necessary. Economists indicate that savings of 20 to 40 percent of compliance costs may be possible under a market-based program. The savings occur because reductions can be implemented where and at a time that are most cost effective. As firms are subjected to second stage requirements, both the costs and potential savings become even larger. In Connecticut, costs are estimated to be between \$700 million and \$1 billion per year to reach attainment of the Clean Air Act Amendments objectives. When the annual savings are

summed over a 14-year time horizon, the total dollars at stake are very large. We really have no choice but to seek cost-effective strategies.

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