



A Dilemma Downwind

Ozone Blows Across State Lines, Raising a Tangle of Regulatory Issues

by Alan Krupnick and John Anderson

As states, the Environmental Protection Agency, and power companies square off in court, judges and administrators are forced to grapple with the economic implications of clean air policy. Recent research at RFF can help.

Air pollution blows with the wind across state lines, sometimes for hundreds or even thousands of miles. In a federal system, this raises difficult legal and political issues. Recent research at RFF illuminates two of the key questions in the current litigation over the federal Environmental Protection Agency's proposed solutions.¹

The dispute is over ground-level ozone. While arguably among the least dangerous of the common air pollutants that the EPA struggles to reduce, ozone accounts for the lion's share of violations of the nation's air quality standards. Thirty-two metropolitan areas, with one-third of the country's population, at present exceed the federal health standard for ozone.

Ozone is produced on hot, bright days when sunlight cooks a mixture of precursor gases, nitrogen oxides (NOx) and volatile organic compounds. The sources of NOx include the combustion of fossil fuels in power plants and automobile engines. One of the EPA's chief weapons in reducing ozone levels has been controls imposed on the emissions from power plants' smokestacks.

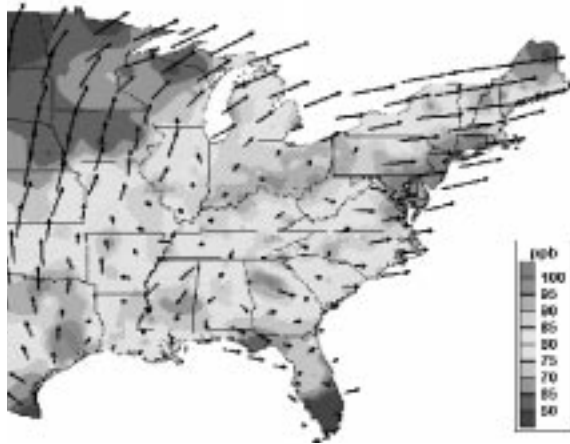
The controls are expensive and can affect the price of electricity. Since the degree of control required varies from one jurisdiction to another, the EPA's rules touch on the competition among the states for economic growth. With deregulation, the electric utilities

are no longer protected monopolies but are fighting actively for customers—accordingly, they would like to spend as little on environmental controls as possible while still complying with the laws.

For years cities in the Northeast have complained bitterly that, regardless of their own increasingly expensive efforts to control ozone, they are pushed into violation of the standard by pollution carried in from the west and southwest by the prevailing summer winds.

In 1995 the EPA set up an elaborate venture in federal-state cooperation called OTAG—the Ozone Transport Assessment Group—in which it would work with the governments of the 37 states from Nebraska eastward, plus the District of Columbia and any corporations and environmental organizations that wanted to participate. Using meteorological modeling they would quantify the amounts of pollution crossing from one region to another and offer recommendations. That work took two years.

Based on it, the EPA announced a rule designed to reduce the imported pollution to negligible amounts. The rule was to cover 22 states, a region reaching from New England as far south as Georgia and as far west as Missouri. EPA's proposed limit on emissions was more stringent in some cases than the OTAG's recommendations but, the EPA explained, "it provides



Winds and Ozone on High Ozone Days. Ozone Transport Assessment Group, Executive Report 1997.

the most improvement in air quality while staying within the bounds of the most highly cost-effective technology available.”

The Clean Air Act leaves to each state the choice of methods to comply with the federal standard. But EPA's method here was to give each state a pollution ceiling that it could meet by imposing restrictions that the EPA suggested. One such restriction was a uniform limit on electric utilities throughout the 22-state region of 0.15 pounds of NO_x emissions per million BTU of energy generated.

To the downwind states, the rule seemed eminently fair. All power plants would bear the same burden, and the result would be that the whole region would be greatly helped in complying with the standard.

But to most of the upwind states in the Midwest and the South, the rule seemed outrageous. Distant plants that contributed only trivial amounts to downwind ozone would bear the same regulatory burden as plants much closer to the urban Northeast that had a significant impact on ozone levels there.

Eight of the upwind states sued. The EPA, they argued, has no authority under the Clean Air Act to take into account the kind of fairness or cost-effectiveness on which it was basing its proposed rule. An appellate court in Washington suspended the rule until it could hear the case. (It was the same court that, a few days earlier in a separate case, had overturned the EPA's proposed new air quality standard for ozone and sent it back to the agency for revision.)

Legal issues also arose from the proposed emissions-trading plan that the EPA had coupled with the new emissions limit. A utility that found it expensive to bring a plant within that limit would be allowed to buy emissions permits from a more efficient plant that was able to stay below the limit. The effect of the trading system would be to cut the utilities' cost of compliance by nearly one-half, relative to a uniform emissions limit that did not allow trading. But it meant that a ton of NO_x emissions from a distant plant, with little effect on the urban Northeast, could be traded for a ton from a much closer plant.

Research at RFF has addressed two of the central issues in this controversy. One is the trading system and whether it needs to be redesigned to take into account powerplant location or, more precisely, the varying effects of different plants' contributions to human exposure to ozone. An exposure-based emissions trading system would be more complex, since the value of each ton of emissions would depend on the locations of the two plants trading it.

To investigate the consequences, RFF researchers constructed a model using EPA's own database, including more than 9,000 point sources of pollution, as well as mobile sources. Then, using runs of the EPA's approved Urban Airshed Model-V produced by its creator, ICF Kaiser, the research team developed relationships between emissions at their point of origin and pollution exposures to people living in downwind regions for each of three types of meteorological episodes that produced significant concentrations of ozone. The model showed that even during weather conditions leading to major ozone violations in the Northeast, utilities in southern Michigan, Ohio, West Virginia and western Pennsylvania have relatively small effects, per ton of NO_x emissions, on New York and New England, with larger effects locally and in eastern Pennsylvania and New Jersey. In contrast, New York utilities have much larger effects, per ton of emissions, on New England and locally. In spite of these spatial differences, when viewed across the entire study region, RFF concluded that there was no clear benefit to an exposure-based trading system, compared with simple ton-for-ton NO_x trading. Public health benefits would be approximately the same, and there would be no significant difference in costs to the utilities.

The second issue, and an even broader one, is

whether the EPA has set its aggregate limits for NO_x at the right level in terms of the health benefits that they can be expected to produce. It turns out that the EPA's proposed limit on power plant emissions of NO_x, with the ton-for-ton trading program, would give an ozone level that is just about right—but only if one assumes that exposure to ozone in the air can hasten mortality.

That assumption is crucial, yet most do not embrace it. The EPA itself has been reluctant to conclude that ozone increases mortality risks, in view of the few studies showing such an effect and the many showing no significant effect. If one assumes that ozone does not cause deaths, the EPA's proposal is much too restrictive, incurring costs far out of proportion with the benefits it would bring.

The Clean Air Act also allows states themselves to take the initiative against interstate pollution by petitioning the EPA to tighten the controls on upwind sources outside their borders. Eleven states have filed such petitions, and last April the EPA issued a rule responding to eight of them. The rule was based on the new air quality standard, and assumed that the EPA's program to control ozone transport would shortly go into effect. When the court overturned the new air quality standard and then stayed the ozone transport program, the EPA was forced to withdraw its rule. A revision, the EPA has said, will appear later this year.

Adding another layer of complication to the legal maneuvering, New York state has announced that it intends to sue 17 Midwestern power plants that, it claims, are illegally treating increases in generating capacity as plant maintenance—thereby avoiding costly requirements for NO_x controls on new sources.

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In effect, the state has decided not to wait for the EPA to try to work out a compromise.

An economic question hangs over this complex series of related legal cases: at what level do the efforts to reduce ozone produce benefits that equal their costs? The courts have so far held that the Clean Air Act does not permit economic factors to be considered in setting standards. But the current litigation will force judges, administrators, and perhaps eventually legislators to deal with the economic implications of clean air policy. Consumers will notice the consequences in their power bills.

Alan Krupnick is a senior fellow and director of the Quality of the Environment Division at RFF. John Anderson is RFF's journalist in residence.

Note

1. Krupnick, Alan, and Virginia McConnell with Matt Cannon, Terrell Stoessel, and Michael Batz, "Cost-Effective NO_x Control in the Eastern U.S.," 1999.

Note: Since this article was completed EPA's attempt at compromise failed, and the agency announced that it, too, will sue a number of Midwestern utilities for illegally treating increases in plant capacity as "maintenance." Lost in this debate is that with NO_x emissions capped in a NO_x trading system, added controls on NO_x emissions from new sources are unnecessary, serving mainly to increase the costs of meeting the cap rather than reducing aggregate emissions.

—the authors