An Acid Test for Congress?

Robert W. Crandall

THE CURRENT DEBATE over acid rain is often perplexing. As with many environmental issues, public concern has outrun the scientific basis for alarm. But even if the experts were agreed that a major program to combat acid rain were justified, it is difficult to see how members of Congress could come together on the details. The acid rain issue has fractured the political coalitions built by environmentalists for past legislative battles, and there are no replacements in sight.

In this article, I shall not address the merits of the case for limiting the sources of acid rain. Rather, I shall trace the political economy of past air pollution legislation in order to help explain the current legislative logjam in this area.

The Old Coalition and Its Consequences

Legislation (unlike acid rain) is not made in heaven. The 1970 and 1977 Clean Air Act Amendments created an incredibly complicated regulatory framework under which the Environmental Protection Agency (EPA) and the states control industrial and utility emissions. But there was method in this tortured madness. Political method. The clean air legislation of the 1970s was shaped by an unusual coalition of defenders of declining industries, high-sulfur coal producers, and environmentalists.

The first leg in this triad of support came from the tired and dirty Northeast and Midwest, trying to protect itself from the growing and clean West and South. According to my analysis (*Controlling Industrial Pollution*, 1983), congressional votes for strict environmental controls came predominantly from the higher-income, low-growth states of the industrial Midwest and Northeast. Peter Pashigian's research shows in even greater detail that support for the nondegradation aspect of clean air policy came predominantly from urban northeastern members of Congress.

The political payoff for these supporters of the clean air legislation has been protection from industrial flight. The protection takes the form of much stricter controls on new sources than on old sources of the major "criteria" pollutants (such as particulates, SO_2, and NO_x). New sources—that is, new plants or additions to plants—are subjected to tight engineering standards and careful scrutiny regardless of the quality of the surrounding air or the density of the local population. Moreover, EPA and the states require detailed demonstrations of the potential emissions from each and every

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one of these new sources. Standards for older sources, in contrast, are much more lenient, and EPA and the states are far from rigorous in making sure that even these standards are followed. Emissions monitoring is rarely continuous; it usually takes the form of an occasional well-announced visit from enforcement authorities or a request to submit letters indicating compliance with standards.

The result of this new-source bias is that pollution control costs are loaded disproportionately on new sources and, therefore, on geographic areas where the prospects for new investment in basic industries are strong. Existing sources get by with emissions levels that are far above those for new sources. Many midwestern power plants, for example, have SO_2 emissions that are four or five times the allowable levels for a new plant of the same size. This of course helps the employees and owners of the older, less competitive plants in the northern areas of the country.

A second leg of support for the clean air initiatives of the 1970s was provided by representatives of coal-producing states in Appalachia and the Midwest—many of whom, of course, were also old-industry defenders. Their backing came in exchange for a most curious form of regional protectionism, embodied in the 1977 amendment to section 111. That amendment requires (1) that all *new* emitters of sulfur oxides, whether they plan to burn clean or dirty coal, install the best available continuous emissions reduction technology—meaning flue gas scrubbers—and (2) that EPA set minimum percentage reduction levels for such equipment. These requirements, quite simply, have eliminated the incentive for utilities in the Midwest to import low-sulfur western coal to comply with the new-source standards. Thus the utilities have continued, instead, to use higher-sulfur eastern coal, incurring no relative financial penalty for this less-than-optimal choice of pollution control strategies.

The scrubber requirement was, of course, also welcomed by old-industry defenders, because it prevents utilities in the West and Southwest from simply using local low-sulfur coal to minimize emissions cheaply. New sources in these latter areas must include enormously costly scrubbers, regardless of the sulfur content of the local coal. A 1978 EPA study demonstrated the punitive nature of section 111 for the rapidly growing Southwest. According to the study, section 111 would raise electricity rates by as much as 11 percent in the Southwest but by only 0.3 percent in the industrial Midwest. It is no wonder, then, that even congressmen from the parts of the Midwest and Northeast that had no coal reserves supported the provision.

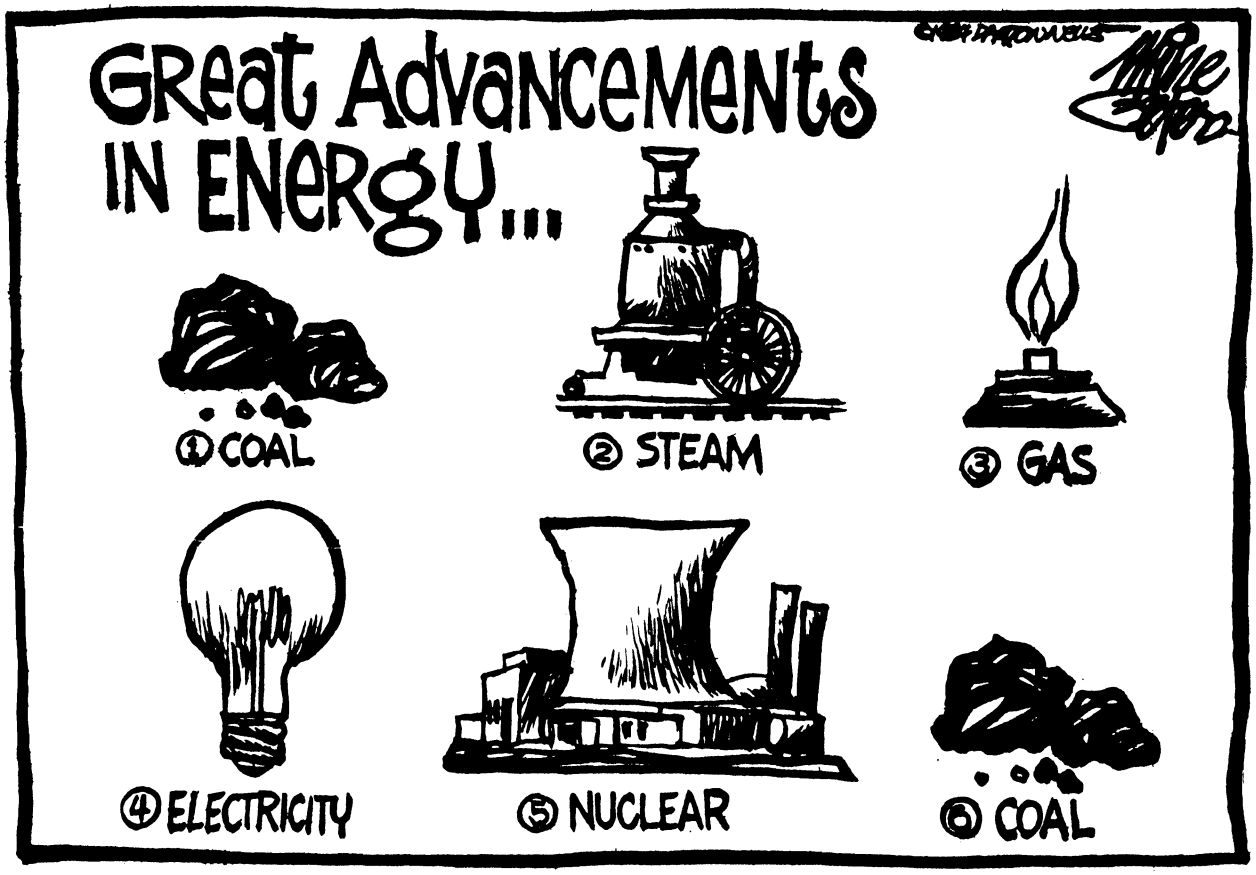
Finally, the third leg of support for the 1970s legislation came from environmentalists. Their support for section 111 was, at a superficial level, easy enough to understand. Scrubbers seemed to hold out at least some promise of environmental progress at little administrative and supervisory cost. A utility cannot fake the installation of a $200 million piece of hardware, and once the hardware is in place no changes in the political climate are likely to lead to its removal. A scrubber offers, in short, the appearance of rigid, mechanical certainty in pollution control—certainty that the more flexible (and much cheaper) control options perhaps do not.

The Environmental Consequences

Environmentalists should nevertheless have known better. It is now abundantly clear that their unholy alliance with traditional polluters did much for the polluters and little for the environment.

Section 111, as already noted, insists on scrubbers rather than low-sulfur coal as the primary means of controlling emissions. But scrubbers are relatively unreliable devices that have a tendency to break down all too often. Since local authorities and EPA are not able to monitor all major emitters continuously, a breakdown may go uncorrected for a considerable period during which the utility spews enormous quantities of SO_2 into the atmosphere. Were the utility using low-sulfur coal instead of scrubbers, such incidents would obviously not occur. As a result, the scrubbing requirement can dramatically increase both costs (relative to the burning of low-sulfur coal) *and* SO_2 emissions.

There is more to this environmental irrationality. The scrubber requirement has added substantially to the cost of new plants and so has reduced the utilities' incentive to replace older, belching boilers with newer, cleaner fa-



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cilities. Had the utilities been free to use low-sulfur coal to meet new-plant performance standards, they would have replaced these dirty, older plants more rapidly. In fact, a 1979 study of EPA options under section 111 revealed that increasing the severity of the percentage-reduction (scrubber) requirement increased both costs and emissions *even when the scrubbers worked perfectly*, if one took into account the reduction of the replacement rate for older boilers.

Finally, the 1970s legislation deliberately refrained from grappling in any serious way with the problem of controlling interstate pollution. Section 126 of the act ostensibly addressed the problem, but that provision leaves interstate pollution matters to EPA, and EPA has generally left these matters to themselves. This is not surprising: it is difficult enough for EPA and the states to promulgate and enforce standards on polluters that cause damage in their immediate vicinity; it is virtually impossible when the costs of reducing emissions fall on groups in one state and the benefits accrue to groups some distance away.

None of these problems was unknown at the time the 1977 amendments were passed. Nor was the phenomenon of acid deposition unknown. Environmentalists railed against the use of 1,000-foot stacks for dispersing pollutants from utilities and industrial sources. Yet they refused to tackle the SO_2 problem at its source—the dirty old plants in the Northeast and the Midwest. In their support for the 1970s legislation, environmentalist groups thus knowingly acquiesced in the establishment of two devastating precedents. The 1977 amendments focused on new sources which, by definition, hold only the promise of burning coal, rather than on existing sources, which actually do emit pollutants. And it protected dirty-coal production, which delivers sulfur to the utilities in the first place, rather than encouraging the production of clean coal, which keeps the sulfur underground.

It is not surprising that the "environmentalist" policy was eagerly supported by legislators from such staunch industrial bastions as Ohio, Illinois, Indiana, and Pennsylvania. Fully 44 percent of estimated 1980 utility emissions

of sulfur oxides came from just fifty utility plants, according to the Office of Technology Assessment, and half of these emissions came from twenty-three plants in those four states. And it is equally unsurprising that this choice of policy produced less than satisfactory environmental consequences. We can now say with confidence that it is past environmental policies, designed to protect dirty coal and dirty industry in the Northeast and Midwest, that have directly and indirectly created the acid rain problem.

Proposed Legislation

There were attempts in the last Congress to atone for these sins from the past. A number of proposals to deal with acid rain were filed, and all focused primarily on reducing the SO_2 emissions of existing utility plants. Large reductions in SO_2 emissions from these sources are of course technologically feasible, and SO_2 emissions are thought to comprise a major share of the precursors of the compounds contributing to acid deposition. All the bills also focused on plants in the Midwest and East. Approximately 80 percent of all estimated utility emissions come from a thirty-one state area, mostly east of the Mississippi, and many of the offending plants are located upwind of the ecologically vulnerable forests and lakes in the eastern regions of the country.

The bills diverged, however, when it came to deciding whose emissions would be reduced, and who would pay for the reductions. The differences are evident in the two principal proposals from the last Congress—S. 3041, which passed the Senate Public Works and Environment Committee, and H.R. 5314 (Waxman-Sikorski), which failed in a House subcommittee vote in May 1984. These two bills provide the main alternative approaches to reducing SO_2, and they are likely to be the leading candidates for acid rain legislation in the forthcoming Congress.

The Senate bill would have required all industrial and utility sources, first, to come into compliance by 1989 with their respective "state implementation plans" (SIPs) as those plans existed in 1981 before recent liberalizations. This would have reduced SO_2 emissions by about 1.5 million tons annually from predicted levels. The bill also would have required a further 8 million ton reduction in emissions by 1995, a reduction to be allocated by agreement among state governors or, failing that, by formula in proportion to utility emissions above 1.5 lbs. per million Btu's after implementation of applicable SIPs. Had the bill been enacted, the prescribed formula would probably have come into effect, for it seems unlikely that state governors could readily have agreed on any other formula for allocating the $5 billion or so annual costs for achieving the mandated reductions in emissions. In any event, ratepayers would have shouldered all costs of reducing emissions from their own utilities.

The House bill would also have allocated reductions in excess emissions among existing power plants, but it would have required a 10 million ton reduction from 1980 levels by an unspecified date. The reduction was to have been achieved by requiring each state to reduce a large part of emissions from utilities that emit more than 1.2 lbs. per million Btu's. In addition, the fifty dirtiest plants in the thirty-one states would have been required to install flue-gas scrubbers to reduce their emissions by 70 to 90 percent. (Once again, scrubbers were to be required here even if burning low-sulfur coal were a more efficient approach to achieving the same end.) A tax of 1 mill per kilowatt hour would have been levied on all non-nuclear power in the forty-eight states to pay 90 percent of the cost of these scrubbers, with remaining monies used to compensate utilities for part of their costs in achieving the rest of the 10 million ton reduction.

Regional Effects of the Two Proposals

The most interesting aspect of the two bills is how they would have redistributed the burdens of controlling air pollution. Both bills targeted most of the reductions and, therefore, control expenditures on the principal beneficiaries of the 1977 legislation: older utility plants in the Midwest and the producers of dirty coal. Moreover, since these two groups overlap geographically, several states would suffer a double whammy.

As Table 1 shows, more than half the projected emission reductions under each bill would have come from eight midwestern states.

Table 1

EMISSION REDUCTIONS REQUIRED
UNDER THE TWO BILLS, THIRTY-ONE STATES

	Senate Bill			House Bill		
	1995 base	1995 goal	Percent reduction	1980 base	Goal	Percent reduction
New England						
Maine, N.H., Vermont	0.06	0.05	12	0.10	0.05	54
Mass., Conn., R.I.	0.32	0.25	21	0.31	0.21	33
Subtotal	0.38	0.31	19	0.41	0.25	38
Middle Atlantic						
New York	0.52	0.37	29	0.48	0.26	46
Pennsylvania*	1.27	0.72	43	1.47	0.62	58
New Jersey	0.18	0.08	56	0.11	0.07	34
Subtotal	1.97	1.17	41	2.06	0.95	54
Midwest						
Ohio*	2.44	0.86	65	2.17	0.58	73
Michigan	0.62	0.37	41	0.57	0.33	41
Indiana*	1.79	0.59	67	1.54	0.37	76
Illinois*	0.95	0.48	50	1.13	0.37	67
Wisconsin	0.68	0.13	34	0.18	0.11	36
Minnesota	0.19	0.13	34	0.18	0.11	36
Missouri	1.27	0.40	68	1.14	0.25	78
Iowa	0.25	0.13	49	0.23	0.11	54
Subtotal	8.18	3.15	61	7.44	2.26	70
South Atlantic						
Maryland, D.C., Delaware	0.36	0.20	44	0.28	0.15	47
Virginia*	0.23	0.16	32	0.16	0.14	16
West Virginia*	1.03	0.49	52	0.94	0.37	60
North Carolina, South Carolina	0.74	0.55	58	0.74	0.28	62
Georgia	0.82	0.34	58	0.74	0.28	62
Florida	0.94	0.49	48	0.73	0.39	46
Subtotal	4.12	2.23	46	3.50	1.80	48
South Central						
Alabama	0.43	0.21	50	0.54	0.26	52
Kentucky*	0.87	0.43	51	1.01	0.30	70
Tennessee*	0.98	0.50	49	0.93	0.27	71
Mississippi	0.28	0.12	57	0.13	0.06	57
Arkansas	0.11	0.11	1	0.03	0.02	35
Louisiana	0.15	0.16	−3	0.03	0.03	0
Subtotal	2.82	1.53	46	2.67	0.93	65
TOTAL—31 states	17.47	8.39	52	16.07	6.20	61

Source: ICF, Inc., *Analysis of a Senate Emission Reduction Bill (S-3041)*, February 1983; U.S. Congress, Office of Technology Assessment, Staff Memorandum, *An Analysis of the Sikorski/Waxman Acid-Rain Control Proposal*, June 21, 1983.

These eight states would have had to eliminate roughly two-thirds of their estimated utility SO_2 emissions. Other dirty-coal states outside the Midwest would also have been heavily affected. In fact, the Senate bill would have required more than half of the nation's projected 1995 utility emissions reductions to come from the eight Appalachian and midwestern states (identified with asterisks in the tables) that now account for two-thirds of U.S. coal production. Pennsylvania, Ohio, Indiana, and Illinois, all key actors in the dirty coal/clean air coalition in 1977, would have been required to contribute 42 percent of the total SO_2 reductions.

Utility rates would also have risen sharply in several dirty-coal and midwestern states. Such rate hikes would have gone as high as 5 to 7 percent for an 8 million ton reduction, and to more than 10 percent for a 10 million ton reduction, as Table 2 shows. Even with the 1-mill electricity tax, which would have defrayed roughly two percentage points of the latter costs, coal states such as Ohio and Kentucky would still have suffered rate increases averaging 8 to 10 percent.

In addition, under the Senate bill, some of the same states would have lost much of their coal production as utilities shifted toward lower-sulfur coal. Indeed, the loss for Ohio, Indiana, and Illinois was estimated at 55 percent of future production in a 1983 study by ICF, Inc., an economics consulting firm. The House bill's full-scrubbing provisions would have provided some measure of protection to coal producers, but would also have entailed significant increases in the already enormous control costs. Since dirty-coal states are, for the most part, also large pollution emitters, even these states had strong reason not to support the

economic folly of the full-scrubbing requirements. The scrubbing provision of section 111, after all, was palatable to the eastern industrial states only because its burden fell mostly on the West.

The high costs that any polluter-pays program would impose on polluters undoubtedly explains why the House bill included a national kilowatt-hour tax, by which consumers in forty-eight states would subsidize the control costs of eastern and midwestern utilities. But how can congressional representatives from the West justify a vote for a tax on their constituents that is designated for use in the Midwest for the benefit of the East? The western member of Congress who is able to persuade her constituents of the wisdom of this policy deserves a very high-ranking diplomatic post.

Table 2

PERCENTAGE INCREASE IN ELECTRICITY RATES UNDER THE TWO BILLS
(from 1980 base)

	Senate Bill, 1995	House Bill (assuming full compliance)	
		With Kwh tax	Without Kwh tax
New England			
Maine, N.H., Vermont	0.7	1.4	2.1
Mass., Conn., R.I.	0.7	1.5	0.6
Middle Atlantic			
New York	0.6	2.1	1.3
Pennsylvania*	3.3	3.7	3.8
New Jersey	1.0	1.8	1.0
Midwest			
Ohio*	5.6	8.2	10.8
Michigan	2.3	2.8	2.1
Indiana*	7.3	9.0	11.7
Illinois*	0.7	3.8	4.2
Wisconsin	5.4	5.4	5.0
Minnesota	0.2	3.4	2.3
Missouri	4.5	7.7	10.0
Iowa	2.6	2.2	1.0
South Atlantic			
Maryland, D.C., Delaware	2.5	2.7	1.7
Virginia*	1.1	1.8	0.8
West Virginia*	5.2	5.5	6.4
North Carolina, South Carolina	0.9	3.4	2.2
Georgia	4.3	7.8	7.8
Florida	2.3	3.0	2.5
South Central			
Alabama	1.3	2.8	2.3
Kentucky*	3.6	10.2	12.4
Tennessee*	2.2	10.4	14.1
Mississippi	3.1	3.6	3.3
Arkansas	0.3	1.1	0.0
Louisiana	—	1.9	0.0

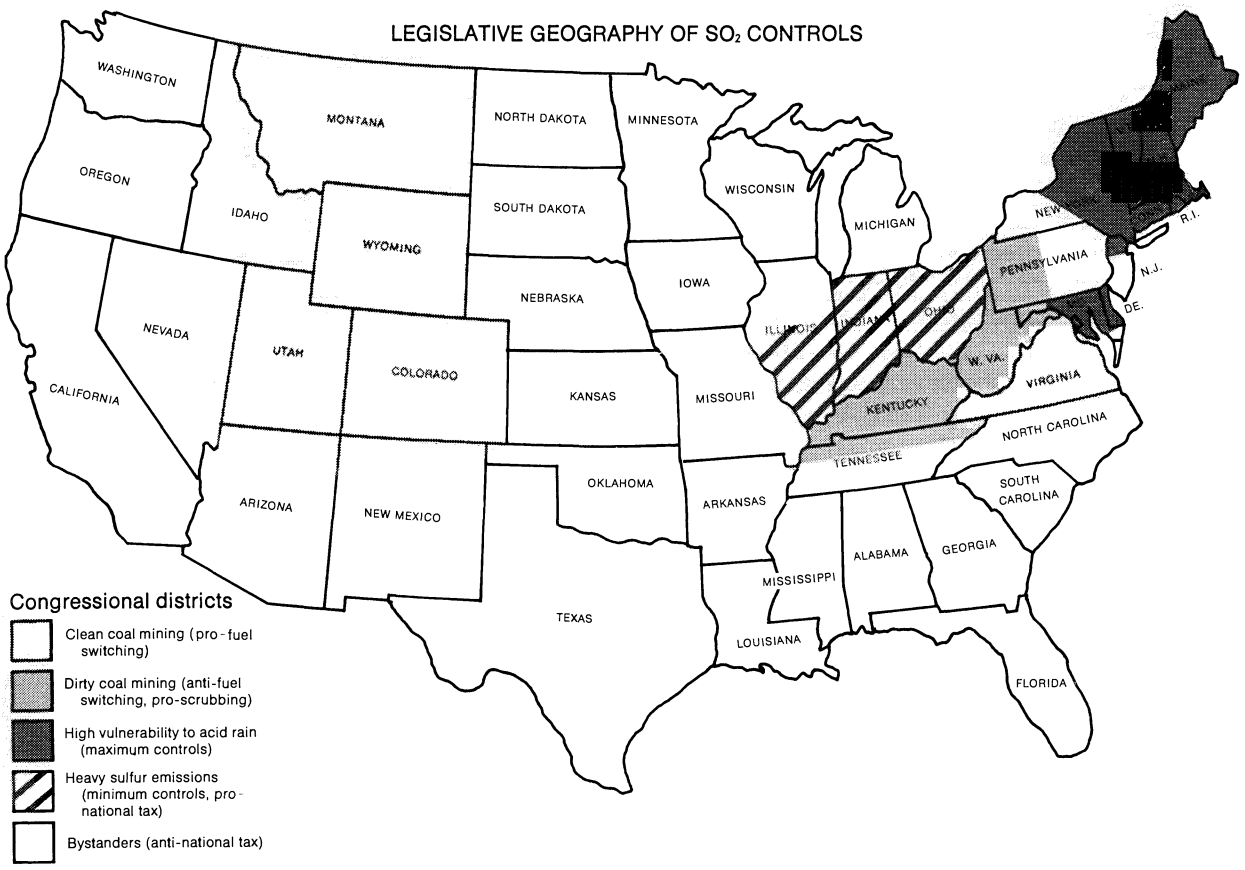
Source: Same as Table 1.

But how can congressional representatives from the West justify . . . a tax on their constituents that is designated for use in the Midwest for the benefit of the East?

The challenge facing acid rain activists is thus very clear. If they are seeking an efficient emission-control policy, they must present their erstwhile allies in the Midwest with sizable increases in electricity rates. And they must also accept the transfer of a significant portion of coal demand from the dirty-coal regions in the Midwest and Appalachia to the western fields in Wyoming, Montana, and Colorado. An inefficient program, designed to protect high-sulfur coal mining, will simply add to the already astronomical costs of the proposed programs in those states that mine high-sulfur coal—states which are, in many instances, also major polluters whose emissions must be curtailed. Finally, any attempt to shift pollution control costs from local to distant ratepayers who have no interest in the problem will surely engender new opposition. A betting man would give sizable odds against any acid rain legislation in these circumstances.

The Politics of Not Sharing

The odds grow even longer when the bookmaker considers what factors actually controlled the details of the acid rain bills proposed in the last Congress. If the bills had in fact been designed with environmental protection as their paramount concern, support might eventually have crystallized around them. But they were not so designed, and the considerations that did enter into their formulation are not the stuff of national political coalitions.



Source: Adapted from the Office of Management and Budget.

An "efficient" control policy is one that reduces emissions until marginal control costs are equal across plants and states. A politically optimum policy, in contrast, requires states to reduce emissions by some nationally uniform fraction of their current departure from efficiency. Under such a policy, states that are currently far from efficient control are given the most lenient standards. They are rewarded, in other words, for their past misbehavior. This is indeed the general approach taken in both the Senate and House bills: both would have required proportional rollbacks from current emissions that exceed a threshold level.

To gain a more detailed insight into the political implications of this general approach I performed a statistical analysis of the SO_2 reductions mandated for various states. Specifically, I used regression analysis to correlate the emission control burdens placed on different states by the House or Senate bills with three factors—each state's air quality, distance from the endangered lakes and forests of New York and New England, and number of political representatives on the relevant legislative committees.* The results indicate that the bills have been crafted with more attention to distributing the burdens of pollution control than to mitigating the adverse effects of pollution.

One might expect under a scientifically rational regulatory initiative that, first, areas with severe *local* SO_2 problems would be dealt with more strictly than those with lower ambient SO_2 concentrations. My statistical analysis reveals, however, that Congress was not particularly moved by considerations of local air quality. Examination of the targeted reduction for twenty-five states (or groups of states) in my sample provides evidence that both bills did ask for greater relative emissions reductions from states with the greatest local SO_2

*The regression equation related the departure of required emissions (R) from "efficient" emissions (E) to the current departure of existing emissions (A) from efficiency, the miles from the center of the state to the New York–Vermont border (M), the proportion of the state's population living in areas with unhealthy SO_2 concentrations (Q), and the number of committee members from the state (D). The actual equation estimated was:

$$(R-E)/E = a_0 + a_1 (E/A) + a_2 M_1 + a_3 Q + a_4 D$$

problems—but the differences are not statistically significant at standard confidence levels.

Second, one might expect a rational acid rain strategy to place the greatest control burdens on plants nearest to the endangered lakes of New England and upstate New York. After all, distant emissions from Detroit or Cincinnati might not affect the acidity of Adirondack lakes, but clearly New York state emissions contribute substantially to the problem if there is one. My statistical analysis reveals no significant relationship, however, between a state's distance from the New York–Vermont border and the strictness of the emission control required of the state by either the Senate or the House bill. This may be politically important—there are several recalcitrant members from Illinois, Michigan, and Ohio on the House subcommittee who might have been persuaded of the merits of acid rain control if the other members had offered to lean more heavily on their own utilities' emissions. Thus, it is not surprising that a congressman from Ohio cast the deciding vote against the House bill.

Finally, the cynic would expect that membership on the Senate committee or the House subcommittee should be worth something to a member's state or district. Why would midwestern and northeastern members of Congress seek to serve on inglorious backwaters of environmental committees if not to minimize the costs of environmental controls for their own states? The cynic's expectations are fully vindicated in the Senate bill. That bill, drafted by Chairman Robert Stafford (Republican, Vermont) clearly provided more favorable treatment for committee members' states—favoritism evident at a high level of statistical significance in my analysis. The bill's emission control requirements do not much depend on a utility's proximity to environmentally sensitive regions, but do depend substantially on the proximity of the utilities to the members' own home offices.

Conclusion

The two key bills for addressing the acid rain problem in the Ninety-Eighth Congress attempted to lessen the impact of controls on the dirty-coal states, but left most of the burden (quite properly) on those states. However, neither bill efficiently distributed the burden among the states on the basis of proximity to the endangered lakes and forests of the Northeast. This is probably due to the influence of congressmen from the Northeast who are more likely to gain reelection by criticizing the lack of emission control in the Midwest than by legislating reductions in their own backyard.

Since virtually any sensible acid rain legislation must increase electricity rates and reduce coal output in those midwestern and Appalachian states that form the successful dirty coal/clean air coalition, it is unlikely that this coalition can be reassembled for the purposes of reducing midwestern SO_2 emissions. It is difficult to see how any other coalition can be constructed to get legislation in this area, for the cost of alleviating someone else's problems will always be evident to lawmakers and voters in areas that do not mine high-sulfur coal and face little problem of acid deposition. Perhaps we will have a new approach to environmental coalition politics, but I fail to see even the dimmest outlines of it now. ■

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