

PERSPECTIVES

ELECTRICITY LEGISLATION: EASE BY INACTION

Proponents of deregulation should breath a sigh of relief now that House Commerce Committee Chairman Thomas Bliley (R-Va.) has made it official that, after two years of trying, Congress will not produce any electricity legislation this year. It could have been much worse. One of the bills on the table actually could have passed, retarding the cause of electricity competition by at least a decade.

Electricity deregulation has failed because it was never really attempted. The fundamental problem is that the major proposals put forth by both the Republican Congress and the Clinton administration reflect an amorphous concept of “restructuring” that would, in important respects, increase rather than reduce regulation. While differing in detail, the proposals in general would have:

- Enhanced the authority of the existing regulatory agency—the Federal Energy Regulatory Commission (FERC);
- Empowered new regulatory institutions; and
- Failed to eliminate a host of existing regulatory impediments to competition.

Other than that, Mrs. Lincoln, how did you like the play?

The \$200-billion-dollar electricity industry is, by any measure, the largest of the traditionally regulated industries, and the last to be targeted for deregulation. The electricity deregulation movement in the United States reflects a worldwide movement away from government control of power markets that is increasingly being driven by technological factors that are conducive to competition. Electricity markets are growing in size, bringing in new competitors, and reducing concentration. Moreover, the development of low-cost, small-scale power generating technologies makes entry easy and the exercise of market power difficult. Real deregulation is not just possible; it is imperative. Billions of dollars in consumer savings are at stake.

MORE POWER FOR FERC

For two years, House Republicans have promoted a vision of electricity restructuring that relies, virtually to the exclusion of anything else, on a federal mandate to the states to open their retail electricity markets to competition. For many, the federal mandate has become the *sine qua non* of electricity reform.

Obviously, opening retail markets is essential to achieving competition. But a mandate to the states is both unnecessary and counterproductive for several reasons. First, in the two years since California became the first state to establish retail competition, a total of eighteen states, accounting for about

half the U.S. population, have adopted retail competition plans. Those states include virtually all the high-electricity-cost states, where consumers have the most to gain. Most of the remaining states are studying various competition options. The rapid movement by the states makes a federal mandate superfluous.

Second, and more importantly, a federal mandate ultimately would be harmful to competition, because it necessarily would entail a dramatic expansion in the regulatory authority of FERC. FERC would be given the task of writing complex regulations detailing the criteria that state plans would be required to satisfy. Those regulations would take several years to promulgate, and would inevitably be tied up in litigation for several more. They would slow the development of competition.

Congress has proposed at least three new types of regulatory institutions in the name of electricity restructuring. (1) Independent System Operators (ISOs) would take over operation of regional transmission networks, under the regulatory supervision of FERC. (2) Regional Planning Agencies would coordinate planning of transmission, generation, and distribution facilities. And (3) a reliability agency would, perhaps in conjunction with FERC, be given the authority to issue mandatory rules.

Several ISOs are already up and running. They are intended to address concerns that vertically integrated utilities—those owning both generation and transmission assets—might use their transmission monopolies to favor their own sources of generation over those of their competitors. There is, however, no evidence to indicate that an institutional framework that separates ownership from control of economic assets, as ISOs do, will be efficient. Several of the more prominent proposals would empower FERC to require utilities to turn control of their transmission facilities over to ISOs, which already are showing themselves to be subject to the same inefficiencies and strategic behavior that characterize existing regulatory institutions.

Finally, Congress has failed to fulfill the federal government’s first obligation, which is to put its own house in order. First, despite ample evidence that generation at the wholesale level is competitive, it has failed to deregulate wholesale power. FERC continues to grant “market-based” pricing authority on a case-by-case basis. Second, despite widespread agreement that both the Public Utility Holding Company Act (PUHCA) and the Public Utility Regulatory Policies Act (PURPA) have outlived their usefulness, Congress has failed to repeal either of those laws. PUHCA is a New Deal-era law that has become a major impediment to the development of a competitive power market. It interferes with the ability of

firms to enter new retail markets and to restructure themselves as they adapt to a competitive environment. Under PURPA, a legacy of the energy policy of the late 1970s, utilities have become locked into long-term contracts at well above market-clearing prices.

Third, Congress has failed to address the issue of publicly owned and subsidized power and whether, and if so how, it can be made consistent with a competitive electricity marketplace. The government remains the largest single power producer, operating nationalized companies like the Tennessee Valley Authority and the Bonneville Power Administration, and providing significant subsidies to other public power entities.

THE MISTAKES OF THE TELECOM ACT

It seems too obvious to have to say, but successful deregulation implies reducing—not increasing—the role of the regulator. The current generation of electricity bills runs the risk of repeating the mistakes of the 1996 Telecommunications Act. That piece of legislation failed to clear federal barriers to competition, and instead empowered the Federal Communications Commission (FCC) to “manage competition” through a nebulous transitional period. The deregulation of airlines and trucking succeeded because the overseeing bureaucracies, the Civil Aeronautics Board and the Interstate Commerce Commission, respectively, were phased out. The FCC, however, has assumed more authority, not less, because the 1996 Act gave it the task of writing the rules for the new, supposedly less regulatory environment.

Two years later, investment and innovation in the telecommunications industry have been stifled, as companies wait for the courts to resolve uncertainty concerning the Act’s major provisions. Needless to say, consumers have yet to realize the benefits expected from allowing competitors in long distance, local telephone, video and data into each other’s markets.

Policymakers need to learn from the telecom experience. Congress should deregulate, not “manage competition” or “restructure.” The current generation of electricity bills should be scrapped and Congress should start with a clean slate when it takes up this issue again next year.

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OSHA REVIEW COMMISSION’S E-Z TRIAL: BACKDOOR AUTHORITARIANISM?

The Clinton administration’s “E-Z Trial” procedures are supposed to help small businesses facing allegations of violating Occupational Safety and Health Administration workplace rules. But do the procedures have that effect? Or does “Reinventing Government” mean backdoor authoritarianism?

From 1990 to 1997, I served as Commissioner of the Occupational Safety and Health Review Commission (OSHRC), the three-member body that decides disputes

between OSHA and private firms. Congress created that Commission to help prevent unfair treatment of employers and employees by OSHA. The Commission functions as a judicial body. When OSHA, a division of the Department of Labor, cites an employer for alleged workplace safety and health violations, the employer (and, in some cases, employees) may file a notice of contest, appealing the citations to the Commission. One of the Commission’s administrative law judges decides the case. An employer, employee, or OSHA can appeal a judge’s ruling to the Commissioners themselves who have the option of hearing the appeal or letting the judge’s ruling stand.

Many cases involve businesses with a small number of employees, and at least one-third of all defendants act *pro se*, that is, they challenge OSHA citations themselves, without help from an attorney. Yet an attorney, whose rate of success against small businesses has naturally been quite high, always represents OSHA.

FROM SIMPLIFIED PROCEEDINGS TO E-Z TRIAL

The Review Commission opened in 1973. By 1980, to help reduce costs in time and money, especially for small businesses, the Commission established its Simplified Proceedings program. The program offered employers cited by OSHA for workplace rules violations a more informal adjudication process, analogous to small claims court. The accused would give up certain rights, for example, the right to prehearing discovery of evidence, but the trial could take place quickly. However, the Secretary of Labor could veto an employer’s request to use the Simplified Proceedings and require that the employer be subject to the full Commission process. Further, cases involving citations in OSHA’s nine most-complex regulatory areas: ventilation, noise, radiation, toxic and hazardous substances, gases, vapors, dusts, mists, and underground construction, were excluded from adjudication under Simplified Proceedings.

By 1992, the three OSHRC Commissioners further expanded Simplified Proceedings. In particular, they eliminated the Secretary of Labor’s right to veto an employer’s choice of the more streamlined approach. But the new system was so poorly publicized that fewer employers chose the Simplified Proceedings option.

In 1995, the new Clinton-appointed Commission Chairman, Stuart Weisberg, in accordance with the Clinton-Gore plan to “Reinvent Government,” modified the Simplified Proceedings system and renamed it “E-Z Trial.” Like its predecessor, E-Z Trial prohibits prehearing discovery, removes proceedings from the constraints of the Federal Rules of Evidence, and requires the parties to negotiate over a pretrial settlement. Cases funneled into the E-Z Trial program normally involve small businesses, including employers with few OSHA citations and, as of July 1997, no more than \$20,000 in proposed fines. (Initially only cases involving fines of no more than \$10,000 were eligible for adjudication under E-Z Trial.) Decisions by judges under E-Z Trial still can be appealed to the full Commission.

But E-Z Trial differs in two important ways from Simplified Proceedings. First, the Commission's Chief Judge rather than the accused employer decides whether a case will be considered under E-Z Trial or under the full Commission proceedings. Reinventing government in this case consists of eliminating an appellant's option.

Second, unlike Simplified Proceedings, E-Z Trial includes cases involving OSHA's more complex regulations that often raise questions about legal interpretation of regulations. Because of the legal shortcuts taken under E-Z Trial and because of the small legal budgets of small companies, the employers' positions on the complex issues involved in such cases likely receive inadequate consideration. And if a defendant appeals an E-Z Trial decision to the full Commission—unlike appeals in an ordinary small claims court—the Commission's ruling can set legal precedents. The result can be, in effect, arbitrarily authoritarian rulemaking by OSHRC.

FOCUS GROUP POLICY

Due to concerns about E-Z Trial's seeming inadequacies, this Commissioner signed off on OSHRC's *Federal Register* announcement of its intention to adopt that approach on the condition that after a test period, the Commission would conduct a survey of employers and their representatives about the fairness and efficiency of the program. The Commission also would consult with its judges, the Solicitor of Labor, and OSHA personnel. In response to requests from management representatives, specific eligibility criteria for E-Z Trial cases were to be issued prior to its final adoption.

But after this Commissioner left the OSHRC, the two remaining Commissioners, both Clinton appointees, adopted E-Z Trial as a regular part of the Commission's Rules of Procedures. The Chairman declared E-Z Trial a success based on several focus groups and on indications that the time to complete a trial under that approach was less than for similar cases in the Commission's conventional proceedings. Both of those reasons are questionable.

The promised assessments of E-Z Trial were never made. No formal survey or evaluation of the eleven hundred-plus cases assigned to E-Z Trial since October 1995 has been conducted. No specific criteria for E-Z Trial cases have been set forth.

Instead, the Chairman discussed the pilot project with two handpicked focus groups of about a dozen people each. The focus groups' results were not made public. But James F. Sassaman, a Philadelphia-based safety professional who has defended construction and general industry employers in over eight hundred cases, and who attended both meetings, reports hearing "a lot of negative feedback."

The Commission's implementation of E-Z Trial, based on the focus groups, seems to contradict President Clinton's 3 March 1998 memorandum to agency heads. The memo directed them to implement procedures to address customer complaints, involve the largest number of customers possible in these discussions, and report, at least annually, on the customer service results achieved.

Further, the Bureau of National Affairs's *Occupational Safety & Health Reporter* of 14 January 1998 relates that Congress has received complaints about E-Z Trial procedures from both inside and outside the Commission. Yet no Congressional oversight committee has asked the Commission to systematically justify its E-Z Trial program.

SUSPECT CYCLE TIME

The Commission also evidenced the success of E-Z Trial with reports of a 60 percent reduction in "cycle time," the time needed for a case to go through the OSHRC appeals process, as compared with the time taken by the conventional, full proceedings. Consistent with that finding, Commission judges report that the Chief Judge has directed them to give the highest priority on their calendars to E-Z Trial hearings. But reduced cycle time does not tell the full story about E-Z Trial's efficacy, especially when compared to the earlier, voluntary Simplified Proceedings. The number of trials seems to have increased under E-Z Trial. Fewer defendants are settling before trial.

Once an employer files a notice of contest with the Commission, OSHA typically offers to settle the citation at approximately half the proposed fine, thereby avoiding the time and expense of a trial. But the pretrial settlement rate is reported to have slipped from about 94 percent for all cases—with Simplified Proceedings cases formerly settling at about 98 percent—to about 87 percent under E-Z Trial. One reason that more employers might prefer a trial to settlement is that the Commission raised the threshold of fines below which cases might be forced into E-Z Trial from \$10,000 to \$20,000. In other words, more is at stake and thus employers have greater incentive to try to have their fines voided entirely rather than settle for paying half.

Further, some employers no doubt go to trial rather than settle based on the belief that E-Z Trial is so "easy" that their chances of prevailing before a judge are greater than they are. Actually, by foregoing an offered settlement, employers in a trial could be judged to have more violations and thus be forced to pay higher fines than they would have paid had they settled. Also, for future violations of OSHA rules employers might be charged with "repeated" or "willful" violations because of past convictions.

POOR PRECEDENTS

Funneling the small employers into E-Z Trial may have costs that extend well beyond the mistreatment of those employers.

E-Z Trial allows OSHA to establish precedents when the employers' defenses are at a minimum. During an E-Z Trial, an attorney will represent OSHA. E-Z Trial denies employers many rights normally enjoyed by defendants, making it more difficult for small companies to refute government charges. This denial of rights also means that appeals to the Commissioners are more likely to go OSHA's way. Thus E-Z Trial allows OSHA to lie in wait for the right case and take advantage of small businesses in order to obtain a precedent-setting decision against future employers.

In the 1997 R.P. Carbone Construction Co. case, two Carbone managers testified at an E-Z Trial hearing that the company had certain protective measures against accidents in place prior to an OSHA inspection. Those managers submitted themselves to cross-examination. But an OSHA compliance officer countered that two other Carbone employees, who had not been present to verify the claim, had told him otherwise. The E-Z trial judge took it upon himself to accept this unsubstantiated testimony and ruled against the company. In a normal court proceeding, such evidence would not be admissible.

The company's lawyer appealed the judge's decision for review by the full Commission. But it was fairly clear that if the appeal were heard, the other two Commissioners would uphold the judge's decision, thereby setting an unfortunate precedent to be admissible in future cases. Thus this Commissioner had to turn down the company's request for a review of the unjust judgement by the E-Z trial judge.

OTHER PROBLEMS ARISING FROM E-Z TRIAL

E-Z Trial's new regulation concerning what OSHA must disclose to defendants is also biased towards the government. OSHA must divulge to accused employers only its investigative report, normally comprising two pages (OSHA forms 1A and 1B) and any evidence that OSHA judges to be exculpatory for the employers. But that is a case of letting the fox guard the chicken coop. Savvy lawyers know that the entire OSHA case file—including the compliance officer's video of the work site during the inspection—must be scrutinized by the defendant before intelligent settlement discussions can begin. Inexperienced employers handling their own cases likely do not know to ask the judge to compel OSHA to provide the entire file, and OSHA, seeking convictions, has no incentive to tell them.

Another new provision allows the Commission's Chief Judge to further shorten the time to E-Z Trial. Sassaman reports that since construction is a traditionally nomadic industry with high employee turnover, about two weeks for trial preparation is often not enough time to locate and prepare defense witnesses. In his written comments on the proposed adoption of E-Z Trial, Sassaman called E-Z trial "a cruel joke played at the employer's expense" that yields "junk justice."

REINVENTING ASSESSMENT

The Clinton administration's "reinvention" of OSHRC's Simplified Proceedings seems in fact to force employers into a process that denies them their Constitutional rights of due process. Yet after adopting E-Z Trial as a regular part of the Commission's Rules of Procedures, the OSHRC Commission Chairman ordered that an instructional video of the E-Z Trial process, costing at least \$50,000, be made. He then nominated his Commission for Vice President Gore's "Hammer" Award that recognizes achievement in reinventing government.

E-Z Trial should be subject to the full, honest assessment to which it was supposed to be subject when listed in the *Federal Register*. At minimum, the 1,100-plus employers assigned to E-Z Trial should be surveyed about the program's fairness and

efficiency by knowledgeable, independent evaluators. Otherwise the process should be considered not reinventing government but, rather, rediscovering authoritarianism.

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GEOGRAPHIES OF SMOG

Environmental Protection Agency regulations meant to reduce smog continue to be controversial and often encounter resistance from local officials and enterprises. Thus it is useful to discover how effective those regulations have been so far.

In 1970 Congress enacted amendments to the Clean Air Act (CAA). Those amendments created the EPA and dramatically altered the role of the federal government in air quality regulation. National ambient air quality standards (NAAQS's) were established. Each state was to implement the standards according to State Implementation Plans (SIP's). In the early 1970's, states lacked the technical expertise and resources needed to effectively implement full regulatory systems. Lawsuits brought by environmentalists and industry groups over the laxness or stringency of SIP's led to paralysis in the process. The situation led to the 1977 amendments to the CAA. Under those amendments, each July, every county in the United States is classified as being in or out of attainment of NAAQS's.

Ozone forms in a complex fashion from volatile organic compound (VOC) and nitrogen oxide (NOx) emissions from motor vehicles and industrial plants, as well as atmospheric conditions such as high temperatures. For "smog," or its major component, ground level ozone [O₃], the standard since 1979 is that the second highest maximum hourly concentration in a given year must not exceed 0.12 parts per million in any county. Attainment is thus based on a spike, or extreme value reading, called the second daily maximum. The standard is based on the assumption that only high spikes impair health, as opposed to prolonged lower-level exposure.

Ozone regulation has a number of key components: regulation of auto emissions through auto equipment specifications; alteration of traffic patterns to reduce travel times through traffic management such as staggered work hour programs and use of public transportation; and regulation of equipment of industrial plants. For the last, the designation of county nonattainment status plays a key role, determining the specification of new and existing equipment. New plants locating in nonattainment counties are subject to the Lowest Achievable Emission Rate, requiring the installation of the cleanest technology available without regard to cost. In contrast, new small plants in attainment areas are exempt from regulations and new bigger plants in attainment areas are subject to a weaker technology standard determined case by case with regard to cost. Existing plants in nonattainment areas are subject to retrofitting and other controls, while existing plants in attain-

ment areas are exempt from regulation. Given that background, it is useful to focus on three key features of regulation: (1) the determination of attainment status based on a single annual hourly spike reading as opposed to more typical daily or seasonal readings; (2) the difference in regulatory stringency for industries in nonattainment versus attainment areas; and (3) the difference in regulatory stringency for smaller versus larger plants.

THE OZONE STANDARD

The result of defining attainment status on the basis of a single hourly spike reading, the second daily maximum, rather than a measure of general air quality, gives insight into the potential pitfalls that appear when designing standards and regulations. In "Air Quality Regulation," published in *American Economic Review* in 1996, I show that the national distribution of second daily maximum readings across monitoring stations has improved significantly over time, moving most stations from readings in excess of the allowable maximum to ones below that maximum. In that respect, regulation is successful. However a fundamental problem is that the national distribution of more typical daily or annual readings across stations has not improved at all, or has grown worse. The EPA is aware of that issue and is trying to adjust the standard to a more typical daily reading. But in thinking about the pitfalls of regulation, an obvious question is, how can measured spike readings in locations improve, but typical readings get worse?

There is a daily ozone cycle, in which the 1-2 P.M. daily peak ozone reading on a typical day is four to five times the minimum reading at 5 A.M. Ozone persists and builds up over the course of the day, as emissions accumulate from economic activity. Inferred economic activity (commuting, trucking, machines turning on in factories) peaks very sharply at 8 A.M. and then declines slowly over the day until it drops sharply around dinnertime. This 8 A.M. peak followed by fairly strong but diminishing emitting activity through the day, results in an ozone peak at 1-2 P.M., given the nature of ozone persistence and build-up.

The key to moving a county from nonattainment status to attainment status is to reduce the height of the daily ozone peak, since this peak hourly reading on very hot days will be the annual spike reading upon which attainment status is based. To reduce this spike reading, states can do two things. First they can shut down or slow down major polluters and try to encourage public transportation on ozone alert days. Second, they can reschedule economic activity away from its 8 A.M. peak and subsequent 5 to 6 hours of high levels to earlier and later times. Congestion migration programs such as staggered work hours and factory rescheduling in nonattainment areas generally, and particularly in California, did exactly that. A change in the daily cycle of economic activity after 1977 significantly dampened ozone peaks (and also raised the trough or off-peak readings) in nonattainment areas, while in attainment areas, peak activity continued to rise. Although the ozone cycle dampened in nonattainment areas, contributing to

the reduction in second daily maximum readings, in many locations there was no impact on the average daily reading. That explains how nationally there has been an improvement in the distribution of second daily maximum readings but not in typical readings. Of course, if only ozone peaks damage health, then that is fine. But long-term lower level exposure could also prove harmful.

EQUIPMENT STRINGENCY

Air quality regulations also vary considerably from state to state and country to county. Harsher treatment of industries in nonattainment areas is meant to improve the air quality. In fact, counties that switch from attainment to nonattainment status subsequently show a significant improvement in air quality readings after the onslaught of regulatory activity. Counties that are consistently in attainment status show a generally modest deterioration in air quality, perhaps consistent with the notion of Prevention of Significant Deterioration in cleaner areas. There is variation across states. States that work over the years to ensure that plants spend more on pollution regulation (controlling for industrial composition and attainment status) experience greater improvements in air quality.

How do the improvements in air quality in nonattainment areas come about? Certainly controls on automobiles and traffic management play a role; but, for much of the regulatory period, state activity has focused on industry. The intent of the CAA is to have plants clean emissions at existing industrial sites, thus contributing to local air quality improvement. This has certainly happened. But there is a second way to clean up industrial emissions in nonattainment areas: plants can relocate over time to less regulated attainment areas to escape nonattainment area regulation. That will improve air quality in nonattainment areas, and lead to some degradation in attainment areas.

It was not intended that the CAA relocate plants, but relocation is not necessarily a bad thing. Moving polluting industries to generally lower population attainment areas reduces the number of individuals affected by pollution and spreads pollution out. However, it involves plants moving from industrial locations with lower costs of production to locations with higher costs of production.

In the 1977-87 time period, a switch to nonattainment status led to significant reductions of polluting plants in a county. My colleague Becker and I extended this analysis to the period 1963-92 in order to determine the effect of regulations on rate of births and survival rates of plants. (See "Effects of Air Quality Regulation," 1997 NBER Working Paper No. 6160) We found a 25 percent to 45 percent reduction in expected number of births of major VOC-emitting plants in nonattainment areas, compared to attainment areas. There was no reduction in a control group of nonpolluters. The reduction in births is greater in counties that are more severely out of attainment and hence likely to face more severe regulations. Declining profits due to regulations drive the tremendous reductions in births in nonattainment areas.

Existing equipment in existing plants was grandfathered

with the implementation of the 1970 Amendments and thus not effected by new regulations. The survival rate of plants born just before those regulations or in the early years of regulation jumped in some industries, especially in nonattainment areas. Presumably that is because those plants got in the door with cheaper preregulation equipment and thus could continue to operate in a cost-effective manner. While politically necessary, grandfathering extended the life of traditional heavy polluting equipment.

INDUSTRIAL COMPOSITION AND PLANT SIZE

A final feature of air quality regulation concerns institutional implementation. States have tended to focus on the biggest polluters and, in some states, only recently have medium or small-size plants come under regulatory scrutiny. Moreover, small new plants in attainment areas are exempt from regulations. Regulations thus favor the small plant sector of industries, typically single plant firms, relative to the larger plant corporate sector. But a shift in industrial composition from larger-scale to smaller-scale plants could worsen air quality. Smaller-scale plants, in addition to being less regulated, also are unable to exploit scale economies in pollution reduction, not to mention in overall production.

An examination of select industries shows that immediately after the adoption of new regulations in 1977-78, the number of small-scale industries expanded enormously relative to the number of larger-scale ones. Some of the expansion was due to small-scale industries exploring the feasibility of operating in unfamiliar attainment counties. In some industries, many smaller-scale operations sustained themselves in the new environment. In other industries there was a very low survival rate among the numerous small-scale operations, perhaps because in these industries, economies of scale were necessary for the health of the enterprise. By 1992, industrial composition in the latter industries looked the way it had in 1977.

LESSONS

Often very small details in regulations can have large and unintended effects. This certainly was the case with the CAA. The following lessons should be remembered:

- (1) If standards are defined on a spike air quality reading, implementation will lead to an improvement in spike readings, but not necessarily more typical daily or annual readings.
- (2) Imposing differential regulation across geography has led polluting plants to move from more regulated nonattainment areas to less regulated attainment areas (which are also less efficient places to locate). Geographic uniformity of regulations would end such moves.
- (3) Differential regulation by plant/firm size has led to a change in composition in some industries towards small-scale plants/firms. Such plants tend to pollute relatively more and fail to exploit economies of scale in production. Uniform regulation by plant size would eliminate those inefficiencies.

The differential in regulation by geographic areas and plant size does conserve on regulatory resources, at least initially. Regulators focus on the biggest plants in the lowest air quality regions. But that has long term implications for the geographic patterns of industrial locations and air quality readings and for industrial composition and plant sizes.

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THE EPA RELIES ON FAULTY MARKET INCENTIVES

On 24 September 1998, the Environmental Protection Agency issued a final regulation to reduce by 28 percent emissions of nitrogen oxides (NO_x). Under certain conditions, NO_x combines with sunlight to produce ozone (smog). The rule is designed to limit the transport of ozone across state boundaries. The impetus behind the rule is modeling that suggests that in some areas in the eastern United States, eliminating all local sources of ozone precursor emissions are not sufficient to meet the revised, July 1997, national ambient air quality standards (NAAQS) for ozone. The rule sets state-by-state limits on NO_x emissions ("NO_x budgets") and defines rules to allow the trading of NO_x emissions "capped" by those budgets.

Economists have long recognized that market incentives, such as the cap-and-trade-model rule defined in the notice, are more efficient at achieving policy goals than traditional command-and-control approaches. However, the use of market incentives is not a sufficient condition for ensuring that a policy action maximizes, or even improves, social welfare. For a market incentive to make people better off, it must meet two key conditions. First, the goal, in this case, the cap or "budget," must be set to maximize social welfare. Second, the tax or marketable permit should be denominated in units that are a reasonably accurate proxy for the environmental risk at issue.

The EPA's rule does not meet those two necessary conditions, and thus is not likely to improve public health and social welfare. It fails the first condition because the revised ozone NAAQS, which the emission limits are designed to meet, will not improve public health and welfare. Analysis conducted by the Regulatory Studies Program of the Mercatus Center at George Mason University suggests that the full costs of implementing the revised ozone standard could exceed \$80 billion per year, and that even without considering those costs, the standard is likely to actually harm public health. The EPA's own analysis attributes small and uncertain health benefits to achieving the ozone standard, and these benefits will be more than offset by the health damage associated with increased penetration of ultraviolet radiation which would result from the ozone reductions.

The proposal fails the second condition because the emissions limitations and trading allowances defined in the rule are not denominated in units that reflect the risk of concern, that is, health risks from human exposure to high ozone concentra-

tions in nonattainment areas during peak ozone periods.

The EPA has apparently patterned its NO_x cap-and-trade rule on its successful sulfur dioxide emissions trading program. But NO_x differs from SO₂ in some important respects. Emissions of SO₂ are a reasonable proxy for the impacts of concern (acid precipitation). SO₂ emissions are national and so are the environmental effects, making distinctions about locations of source and receptor points less important. The timing of SO₂ emissions is not an important factor in their ultimate environmental effect. As a result, a ton of SO₂ is a uniform, fungible "commodity" that is well suited to trading.

In contrast, NO_x concerns are based on alleged public health risks associated with high ozone concentrations that are localized both in space and time. The relationship between NO_x emissions and ozone concentrations is not linear. In the presence of heat and sunlight NO_x can react to form ozone, but each unit of NO_x emitted does not form an equivalent unit of ozone. Furthermore, ozone concentrations in a particular area are more heavily affected by NO_x emissions from nearby sources than from distant ones. Finally, ozone has been linked to acute, rather than chronic health risks that result from a few high ozone days that occur during certain weather conditions in the summer months. (The EPA defended its ozone standard based on acute respiratory attacks during high ozone episodes.) As a result, region-wide NO_x emissions, which are the focus of the proposal, are not a good proxy for the public health effects that are of concern with ozone.

Clearly, tons of NO_x emitted are not uniform and fungible "bads," yet the EPA's proposed cap-and-trade rule would allow them to be exchanged freely as if they were. Given the difference in ultimate impacts (peak ozone concentrations and health effects) of emissions in different parts of the country at different times of year, unlimited trading across the whole ozone transport region could have undesirable health consequences. For example, EPA modeling data suggest that if a

source in North or South Carolina were to sell excess allowances to a source in Connecticut or New Jersey, air quality in the major nonattainment areas of the northeast would actually get worse. Similarly, the exchange of a ton of NO_x emitted in May for a ton of NO_x emitted in August could make summer ozone episodes, which are the sole public health concern articulated by the EPA, more severe.

Market incentives that encourage temporary measures to reduce ozone concentrations on peak days in key areas would be more effective at targeting the health risks of concern than the EPA's cap-and-trade approach based on region-wide NO_x emissions. For example, on days designated ozone alert days, a jurisdiction that expects ozone levels to exceed the standard might offer to compensate an upwind jurisdiction to reduce its emissions of ozone forming compounds (NO_x and volatile organic compounds). It might do that in tandem with incentives to reduce ozone formation within its own boundaries, such as market measures to discourage emissions from a variety of sources on ozone alert days. An "open market" trading program that allowed the trading of discrete emission reductions with limitations on trading among geographic areas and seasons, could also be more flexible than the EPA's approach and provide stronger market incentives to reduce emissions during peak ozone periods.

Even the EPA's cap-and-trade proposal could be improved if the EPA defined the cap, not in terms of tons of NO_x removed at the source, but in terms of the health benefits from reducing ozone. It would require the development of nonuniform caps tailored to the impacts attributable to individual jurisdictions. The EPA could also better target the risks of concern by adopting a trading approach that limits trades between subregions.

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