CONF - 810631--3

LA-UR -81-1372

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MASTER

AUTHOR(S): Richard J. Tobin and John A. Jaksch

SUBMITTED TO: 74th Annual Meeting of the Air Pollution Control Association, Philadelphia, PA, June 21-26, 1981

University of California

LOS ALAMOS SCIENTIFIC LABORATORY
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Form No. 836 R3
St. No. 2629
1/78

UNITED STATES
DEPARTMENT OF ENERGY
CONTRACT W-7405-ENG 36

MANAGEMENT ALTERNATIVES TO THE CLEAN AIR ACT AMENDMENTS OF 1977: AN ANALYSIS OF REGULATORY VERSUS ECONOMIC APPROACHES

Richard J. Tobin
State University of New York at Buffalo
Buffalo, New York 14260

John A. Jaksch
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Prepared for Delivery at the 74th Annual Meetings of the Air Pollution Control Association, Philadelphia, Pennsylvania June 21-26, 1981.

Introduction

This paper discusses the presumptions of current institutional arrangements in the management of air quality and contrasts these with alternative options. Considerable discussion will be given to the theoretical considerations embodied in economic alternatives to regulations. The paper examines the viability of economics vis-a-vis regulatory approaches with respect to institutional practicality, acceptability, feasibility of implementation, and general effectiveness in meeting stated air quality goals.

The last ten years have witnessed a notable increase in government regulation. New programs in the field of health, safety, and environmental protection seemed to flow from Congress with unusual regularity and in a previously unparalleled manner. In the environmental arena alone, for example, Congress passed laws regarding solid wastes, strip mining, noise abatement, toxic substances, land-use planning, coastal-zone management, and air and water pollution. Similar lists could be compiled for other substantive areas. Regardless of their particular area of concern, many of these laws share a reliance on regulation, with the use of command-and-control techniques whereby the government specifies behavior designed to achieve chosen standards.

However desirable regulation may have appeared in the past, it is clear that it is now under attack. One need not look far or wide to find critics of the Federal Government's regulatory programs. Many of these programs are said to contribute to inflation, encourage delay in business and commercial activity, foster inefficient solutions, and represent an unnecessary intrusion of government into people's lives. Though other alleged deficiencies are easily cited, the point is that critics are increasingly vociferous in their demands for change.

In the face of unmet goals and undelivered promises, even many supporters of the Government's programs have begun to question the wisdom of regulation. Perhaps more important, Federal policy makers are demonstrating increased sympathy for these concerns about the merits, efficacy, and effectiveness of regulation. President Ronald Reagan's recent Executive Order in February 1981 on regulatory impact analysis and review is only the latest manifestation of this concern.[1]

For many people, the appropriate solution for the ailments of regulation includes its elimination or substantial reduction. In place of regulation these advocates favor the substitution of alternative strategies that supposedly reduce Government's role and increase managerial flexibility, but still lead to the achievement of desirable goals. The current debates about the Nation's air quality goals provide a relevant illustration. In recent statements, for example, spokesmen from the Business Roundtable and the National Association of Manufacturers argued that the law's requirements are too costly, inflexible, and insensitive to other national goals, such as energy development. Without disputing the need to achieve clean air, the two groups called for changes that would reduce the costs and burdens associated with the Clean Air Act Amendments of 1977.[2]

Calls for changes to the act frequently seem to reflect several unstated assumptions. These include a belief that the transition from regulation to any new approach will be relatively straightforward, that issues of political feasibility are of limited concern (especially in view of the growing opposition to regulation), and that alternative strategies will "solve" the problems believed to be associated with regulation.[3] Though these claims may be correct, prudence surely dictates that thorough scrutiny be given to any proposals that may bring about large-scale changes. The logic, of course, is that change often involves many unintended consequences, and that the possible impacts of implementation of any new approaches ought to be estimated beforehand.

In short, the current debates about the efficacy and efficiency of regulation and the likely congressional reauthorization in 1981 of the current clean air legislation provide justification for examining alternative approaches to the control of air pollution. The purpose of this paper, then, is to examine the dichotomy between regulatory and market incentive approaches to achieving environmental objectives.

The Problem

It would seem that one objective in any political system would be to maximize the compatibility of policy goals. What is suggested is that most policy makers prefer situations in which achievement of one policy goal does not diminish the prospects of achieving another goal. Ensuring the availability of sufficient energy supplies and protecting environmental quality immediately come to mind as examples. One can find many instances where demands for energy can conflict with a desire for a habitable environment. As an illustration, the decreasing supply of environmentally clean fuels and their rising costs have focused public and private attention on energy-environmental trade-offs. The point to be made is that patterns of energy consumption almost invariably affect air quality. This interrelationship is part of the explanation for criticism of existing regulatory policies in the environmental arena.

However one defines the energy problem, it is clear that it has resulted in a closer scrutiny of the resultant impacts of energy development on environmental quality. The policy problem is how to achieve a balance between environmental protection, the need for a strong economy, and increased domestic production of energy. For example, essential questions that can be raised concerning energy-environmental tradeoffs are as follows: Can the Nation's standard of living continue to support present, or anticipated future, environmental gains? To what extent can control technology conserve the assimilative capacity of the environment? Are the costs of incremental improvements in environmental quality, often occurring only as a result of increased energy consumption, worthwhile in the face of increasing energy costs?

In past years, when little conflict seemed to exist between energy and environmental goals, these questions were only infrequently asked, and

then not by policy makers. Now that the questions cannot be ignored, however, their answers raise concern about the continued appropriateness of traditional regulatory approaches, as well as the desirability of alternative, economic-based approaches, to the control of air pollution.

One should not be left with the impression that energy issues are the only source of concern about environmental regulations. During the initial period of Federal involvement in environmental protection, improvements in environmental quality were obtained fairly easily. Some gross and obvious pollution problems were easy to identify and remedy. Social and political judgments supported the concept that benefits clearly exceeded costs, and technology existed to make substantial reductions in pollution emissions.

Many of these factors have now changed, and environmental regulation has become increasingly more costly, difficult, and contentious. The reasons are several. First, declines in growth rates and industrial productivity have caused many people to question the relative priorities attached to environmental protection. Some parts of industry view the requirement of installing sophisticated, expensive air-pollution-control devices as a commitment of capital resources from which little, or no, economic return is obtained. Some small and inefficient companies have been forced to close down because expenditures for pollution-control devices, along with other economic factors, have eliminated their profit margins. The firms may be unable to pass the higher costs of operation to the consumer because of weak market conditions, and the firms find it difficult to increase productivity enough to absorb the costs.

Second, as more pollution and pollutants are regulated, the costs of obtaining incremental improvements in environmental quality become increasingly more expensive. In essence, the initial increments of pollution are much cheaper to control than are the last increments.

Third, the increasing sophistication of measuring devices, the growth of scientific knowledge about the impacts of pollution, and the identification of new toxic and hazardous pollutants serve to compound the problems of regulators. In some instances, information on the potential effects (or confirmation of the effects) is unknown or very sparse. It may take years to gather and collect sufficient information on which to base an informed decision. Despite the need for time, decisionmakers are often called on to make decisions on environmental issues before all the facts are known. The issues, questions, and concerns surrounding acid rain provide a good example. Depending on the source of information, acid rain is either a negligible problem that can be readily ignored or the most substantial air quality issue now facing the country. In short, although there are surely more ways to critique environmental regulations, the reasons cited do provide a sense of the concern that exists.

Regulatory versus Economic Approaches for Controlling Pollution

The previous section presented the issues facing the United States in achieving environmental objectives while also recognizing the need for energy

development and the achievement of other desirable goals. The issue is whether there are better ways to achieve environmental goals than with the present regulatory approach.

Economists and others have long argued in favor of control systems that use some form of monetary or market incentives. Under the current regulatory arrangement, many economists argue, the existing incentives to reduce pollution are ineffective and inefficient. In place of these controls, economists seek methods that provide flexibility and motivation while attempting to achieve a goal or objective at least cost. Contrasting the regulatory and economic approaches helps to put both in context.

Regulation decrees and directly imposes certain forms of behavior on firms by means of rules or standards relevant to ambient emissions or concentrations of pollution. With a regulatory approach, pollution control authorities must carry out at least four steps:

(1) determine the rules or regulations governing each firm's behavior that are necessary to achieve a given pollution control objective;

(2) determine and establish the penalties to be imposed for noncompliance;

(3) conduct a monitoring of discharges so instances of noncompliance can be detected, or establish some system of reporting and auditing to check progress; and,

(4) use the courts for penalty enforcement.[4]

In deciding how to react to environmental regulations and their accompanying standards, dischargers must compare various compliance costs with penalties and other expenses associated with noncompliance. The costs of noncompliance can be high and uncertain. Alternatively, noncompliance may not be detected and, if detected, might be ignored because of limited resources, higher priorities, or for some other reason. The kinds of enforcement imposed on polluters may also vary with the administrative agencies and courts. Each may take a hard or soft line in bringing action to enforce the regulations or imposing noncompliance penalties. Moreover, complaints are often heard that regulatory standards are static, inflexible, and unwieldy.

To overcome these problems, a market-based system has been proposed. To establish and use such a system, a pollution control authority would take at least three steps:

(1) determine the level of charges per unit of pollution discharged to induce desired abatement behavior on the part of a firm;

(2) monitor the discharges and establish a system for reporting or auditing; and,

(3) collect the pollution revenues equal to the charge per unit of pollution emitted times the amount of pollution discharged during each reporting period.[4]

Many economists have been favorably impressed with a market approach because of the possible advantages inherent within it. The most frequently cited advantages can be summarized as follows:

(1) price incentives should influence a polluter to internalize the externality (i.e., pollution):

(2) the instruments, once implemented, are flexible and can be altered to accomodate changing environmental objectives;

(3) market incentives can be more equitable than other enforcement instruments; the incentives can internalize the externality to the producer and ultimate consumer of the produce (or, alternatively, incentives can effectively reallocate resources within the private sector in a more socially desirable and optimal way); and

(4) market mechanisms minimize interference with private decisionmaking processes as polluters are allowed to choose whatever means they wish to reduce pollution.

In essence, market mechanisms can act as an inducement to industry to minimize costs by controlling emissions up to the point where the costs of control just equal the amount of fee per unit discharged. In economic terms, the objective of a market approach is to achieve an economically efficient point where the net benefits of pollution abatement are the greatest. Although it is theoretically desirable to reach this point, the information requirements needed to achieve it are overwhelming. From a practical standpoint, therefore, pollution control authorities must settle for less than the ideal until improved data become available.

Figure 1 graphically displays the concept of economic efficiency. Dollar costs and benefits are shown on the two vertical axes; the level of pollution reduced on the two horizontal axes. In the upper graph, the curve O' Y^O N' represents the total cost of treatment; in the lower diagram, OYN depicts the marginal costs of treatment, or the first derivative of O' Y^O N'. O' F' P' shows the total social benefits of pollution control in the top figure; FYR shows the marginal social benefits in the lower part. Points Q' and Q represent total reduction of all pollution; O' and O represent no pollution control. The point of economic efficiency, with respect to pollution control, is at U', with O' U' pollution controlled. This results because at U' the net difference between total costs (O' H') and benefits (O' C') is greatest. Point U (in the lower drawing) also is an economically efficient point and presents an alternative way of illustrating the concept presented in the upper drawing. In the lower drawing the marginal social benefits of pollution reduction equal the marginal costs of treatment at Y. If the amount of waste treated is to the left of U' or U, then the net benefits are less (that is, marginal costs are less than marginal benefits), and it would be socially beneficial to treat more pollution. In short, it would be to society's benefit to impose a higher fee or to provide a higher subsidy to induce a firm to move toward U' or U. The opposite would hold for pollution treatment taking place to the right of U' or U. Too much pollution treatment is taking place, and it would be to society's gain (that is, net benefits would increase) to reduce the fee or subsidy in order to induce a firm to move toward U' or U.

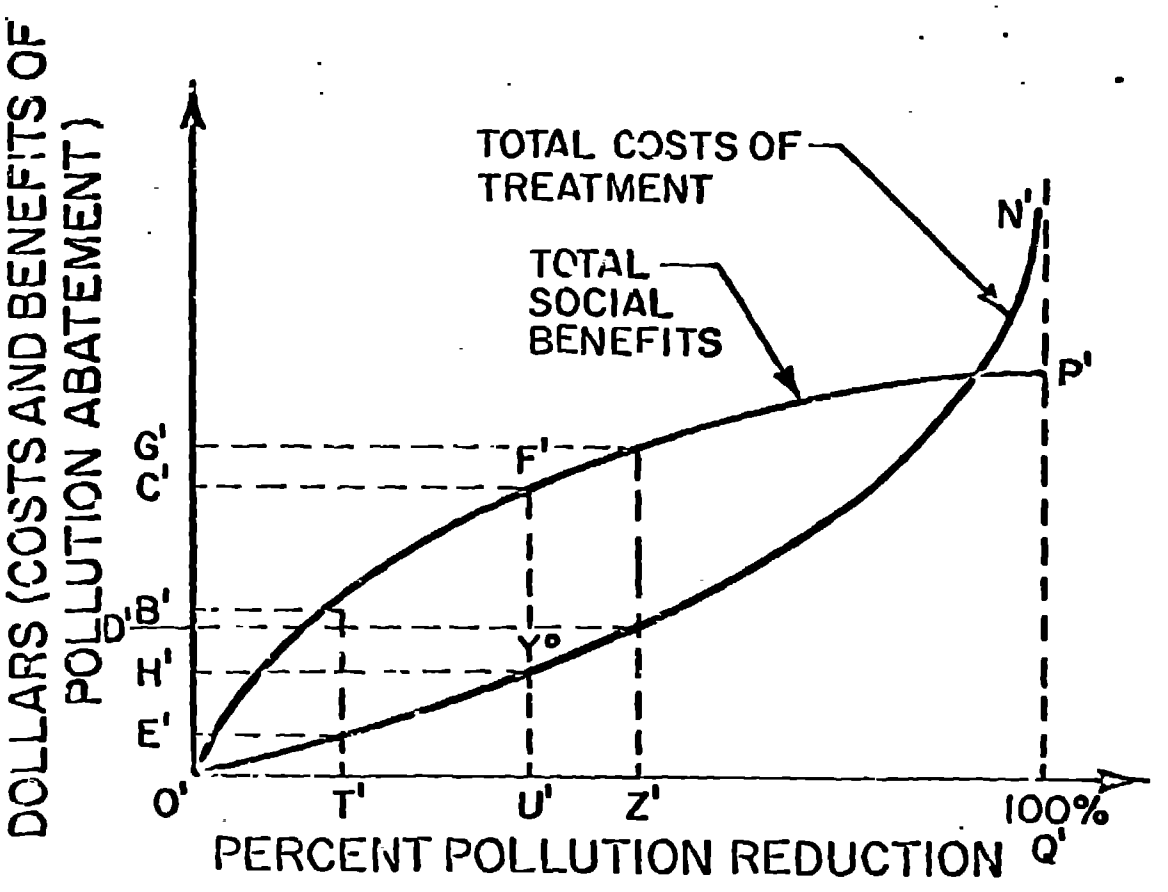

Fig.I. ILLUSTRATION OF SOCIAL OPTIMALITY

Figure 1 About Here

Comparison of Two Major Market Incentives: Fees and Subsidies

As noted above, emissions fees (or taxes) should be designed to induce a polluter to internalize all or part of the pollution costs that were previously ignored. A firm may decrease output because of higher production costs, but the reduced output may result in reduced emissions. Consequently, consumers may have fewer products to consume and at higher costs, and this may be viewed, in economists' terms, as a utility (welfare) loss to the consumer. However, the utility loss may be offset by environmental improvements and the substitution of older products for the more expensive ones.

In contrast to fees, subsidies represent direct financial aid given to a firm to induce pollution control. To the extent that a firm fails to treat its wastes and does not avail itself of the subsidy, an opportunity cost in revenues is foregone. Viewed from another perspective, a subsidy (like a fee) has the net effect of inducing a firm to internalize the costs of pollution externalities.

Fees or subsidies can be levied on or given to, respectively, specific production inputs, products, profits, or emissions and effluents. Fees and subsidies are viewed as the most direct methods to control pollution and to improve environmental quality. The implementation of a subsidy can symmetrically achieve the same emission reduction as a fee. In other words, fees and subsidies are viable methods of influencing resource allocation with the objective of improving environmental quality.

One of the major differences between a fee and a subsidy relates to the issue of property rights. The imposition of a subsidy assumes that property rights to the environment accrue to the polluter, who is paid not to exploit something that the firm explicitly owns. One objection to this is that tax resources collected from the public are given to firms to discourage their use of what many people believe to be a public resource, namely the environment. This statement also reflects a key difference between fees and subsidies. With the former, polluters must pay a charge to a public body in order to pollute, and property rights to the environment are assumed to be in the public's possession. In contrast, with subsidies a public body provides revenues so that a firm will not pollute; this suggests that the public does not own the environment. Additionally, a subsidy can actually create an incentive to generate pollution if the costs of reducing or treating the pollution are less than the per unit waste subsidy. Obviously this must be a major consideration in the use of any subsidy approach.[5]

At least three important observations must be made about fees and subsidies. First, if properly implemented, both approaches will yield the same amount of waste treatment. Second, the two methods' distributional effects are profoundly different. Fees increase the cost of production and, ultimately, prices to consumers. Subsidies, in contrast, ordinarily do not affect prices, but do raise taxes. Hence, a subsidy's distributional effects may be more diffused through the economy. Moreover, consumers more remotely,

if at all, concerned with the product's use or pollution may be made worse off through implementation of subsidies and possible tax increases than if a fee were implemented. This would occur because all taxpayers within a jurisdiction would "donate" to the subsidy, whereas the impact of a fee would be felt only by those who buy particular items produced by fee-paying polluters.

Finally, although emissions fees have the potential to reduce a firm's profitably, subsidies may have an opposite impact. Subsidies may keep alive a polluting firm that may otherwise have been unprofitable, even in the absence of a pollution charge. By making the firm potentially more profitable than without the subsidy, the subsidy may encourage new firms to enter the marketplace. The net result could be an increase in pollution above levels existing before the subsidy. Thus, fees are generally preferable to subsidies on grounds of equity, distribution, and property rights.

Marketable Pollution Permits and Refundable Deposits

Although fees, taxes, and subsidies have received the most attention from advocates of regulatory reform, other strategies for pollution control exist. Two such strategies include the sale of pollution permits and the use of refundable deposits.

The first of these, marketable permits, allows a pollution control authority to set an environmental goal or target and then to auction, or sell, a fixed number of permits that grant the right to pollute. By controlling the number of permits (as well as the overall emission capacity attached to each permit), authorities can achieve their desired goals. In other words, the number of permits issued and the rate of emissions discharged place a ceiling on pollution.

In theory, marketable permits share several of the advantages of emission fees. To the extent that they function relatively routinely and automatically, permits are dependable tools. Similarly, both systems (1) require some monitoring to ensure that a polluter's emission rights are not being exceeded; (2) are equitable to the extent that they require polluters to internalize the costs of pollution; and (3) create incentives to minimize pollution (because less pollution would require less costly permits or fewer permits).

In addition to the shared attributes, pollution permits appear to have other advantages beyond those associated with fees. Fees are vulnerable to inflationary impacts, but pollution permits seem much less so. Because the number of permits is limited, the permits' value increases with inflation. Other variables likely to cause an increase in the value of permits include population growth and industrial expansion. Such growth and expansion can be expected to increase the demand for pollution permits, and their prices should rise accordingly--the right to discharge pollution becomes an increasingly scarce good available at higher and higher prices.

Another attribute is that the permit system mitigates the uncertainty frequently associated with fees. Pollution permits reduce uncertainty by

setting an emission level that cannot be exceeded. This is in contrast with the uncertain response of polluters subjected to fees.[5] The firm may decide to pay the fee rather than reduce pollution. Indeed, under some circumstances it might be worthwhile to do so. On the one hand, for example, some companies might be willing to pay whatever fees are imposed if such payment precludes some other companies, including potential competitors, from locating in an adjacent area. Companies with short-term interests (perhaps mining concerns) might find it more advantageous to pay a fee and pollute than to install costly control technologies that have useful lives far in excess of the company's intended operations.

Pollution permits may be flexible enough to facilitate changing environmental goals or objectives. For example, if the goal is to loosen environmental standards, then the goal can be accomplished by increasing the number of permits available. Finally, pollution permits may be made geographically discriminating as well. If a particular area is more pollution sensitive, then the number of pollution permits issued and sold can be limited.

Let us is now turn to the use of refundable deposits for controlling or mitigating pollution. The idea behind such deposits is to make pollution unprofitable. Under the system a polluter would be required to put up a refundable bond or deposit against the damages and clean-up costs resulting from pollution, or for the proper disposal or recycling of potentially polluting materials. If a firm substantially reduced its pollution, most of the deposit would be returned .

The refundable deposit has several of the commendable features associated with other economic approaches. Moreover, the deposit system serves reasonably well in areas where compliance monitoring may be impractical or impossible. The system's major disadvantage is that it may not be as cost-effective as other forms of fiscal incentives.

Some Practical Problems with Economic Approaches to Pollution Control

Despite the appearance of initial appeal on the part of the economic strategies, they are not without potential political and institutional problems. Because emissions fees have received the most attention from those in favor of economic approaches to pollution control, it is appropriate to focus on the fees' possible problems.

The first problem to be faced is the appropriate level for a fee (attempting to approach point U' or U in Figure 1). What constitutes an appropriate fee? Should the fee be related to the cost of installing the necessary control equipment or, alternatively, should it be related to the damage costs of the pollution? These questions require crucial choices because the two methods will produce widely disparate fees. In either case, significant amounts of information would be necessary. Reliance on the first method would require polluting industries to provide information on the cost of abatement or control devices.

In contrast, setting the fee on the basis of damage costs would involve a multiplicity of semi-value judgments on such things as the costs associated with pollution-related illnesses or death, and damages to plants, animals, and buildings. The difficulties in doing so are well known. Although a damage-related approach may be attractive, its use is highly problematic. From a practical viewpoint, policy makers do not have enough information, and economists do not have the empirical or sometimes the theoretical tools, to adequately measure or place an economic value on all damages associated with pollution emissions. Hence, the likelihood of arriving at an efficient level of pollution control may be impossible.

Even if these hurdles could be overcome, problems would still exist with the size of the fee. Initial calculations might determine an appropriate fee, but as soon as any variable in the equation changed (for example, the rate of inflation, the total pollution load in an area, improvement in control technologies, the estimates of damages), recalculation would be necessary. Static fees would likely be undesirable as they might not induce the desired level of abatement.

The political difficulties in changing fees cannot be ignored. On the grounds of due process alone, a change in fees would probably necessitate extended rule-making hearings. The number of hearings would be multiplied to the extent that different fees would be established for different pollutants, as surely would be the case, because the control and damage costs of various pollutants are not always related. For this reason, decisionmakers are not likely to favor frequent fee revision.

The discussion to this point has assumed that an appropriate fee can be established initially. If, however, this is not the case, then the potential disadvantages of fees become even more glaring. A fee that is too low would, by definition, fail to achieve its objectives, once imposed. For polluters, it would be cheaper to pollute than it would be to control their emissions. A fee that is to high could stimulate delays and legal actions, and could become counterproductive if resources are misallocated for unnecessary control equipment. In short, unless a fee falls within the appropriate range, which would be fairly narrow, opposition would likely be great and political feasibility very low.

Although typically labeled as a fee, emissions fees can be identified just as easily as a tax, which is defined simply as a payment of money for use by a government. Identifying a fee as a tax has several important consequences. In an era when tax reduction is politically popular, the prospects of imposing new taxes may not appeal to elected public officials. Similarly, legislative bodies at the state and Federal level have specialized committees with responsibility for tax matters. Consequently, legislative committees with responsibility for environmental matters would probably have an insignificant role in establishing the legal framework for the fee. The most important point is, however, that tax committees usually do not delegate their authority to set taxes to administrative agencies.[6]

Assuming the willingness of tax committees to allow emissions fees, the resulting fee might bear scant resemblance to an appropriate fee, especially because such committees have a propensity to set tax rates at the

same level for similar categories of taxpayers. In other words, a single fee/tax might be set for all power plants in a state or region regardless of the varying impacts on air quality that each plant might have. Furthermore, once established, a change in the fee might require additional action by a tax committee, and it is highly unlikely that committee members would be amenable to the frequent changes that might be necessary in the early years of operation.

Industries subject to fees are also likely to express apprehension, especially because of their possible distributional impacts. Under a fee system, less efficient and heavily polluting firms would face higher costs, reduced output, and lower profit margins. One consequence might be to put dirtier urban regions at a competitive disadvantage in attracting further growth while encouraging the pollution of cleaner, rural areas. Similarly, for the declining and heavily polluted regions of the Midwest and Northeast, it is highly unlikely that politicians would countenance any system that exacerbates their constituencies' economically disadvantageous position.

These concerns provide some explanation of why emissions fees have not been warmly embraced in the United States. In addition, one can expect continued opposition from both the public and private sectors to market alternatives for traditional regulatory approaches. More specifically, the following questions and concerns have been raised about the possible adoption of an emissions fee:

Can or should a well-entrenched, reasonably working, established system be replaced by one that is new and relatively untried? Is a fee system just an added burden on top of an existing system, resulting in higher enforcement and administrative costs? Will the administrative and enforcement costs of setting up the new system be greater than the costs of the old system?

How will the revenues collected by the system be used? Will or could the system be another government taxing scheme, with fees arbitrarily set and used to raise revenue for the general fund?

Will the charges be set or changed to prevent or allow installation of new polluting facilities in a region?

If there is a variation in fees between regions, will there be competition between regions for energy and industrial growth development?

How will emissions fees be imposed during upset conditions (accidents where pollution-control facilities are not operating at designed capacity)?

Finally, a difficulty exists in determining the scope and responsibility for local, state, regional, and national governments in environmental control. Each governmental level may have different environmental and/or developmental objectives, which implies different

environmental values and standards. Regional differences with respect to both environmental quality and energy development are already evident.[7] The growing emphasis on state responsibility now evident in Washington has only served to heignten the differences.

Like emissions fees, pollution permits have several possible problems associated with their use. First, potential problems exist in regard to the establishment of the appropriate boundaries for permitting jurisdictions. The task may be easy from a meteorological or topographical perspective, but perhaps not from an institutional one. If regions or airsheds for permits are determined on the basis of meteorological considerations, for example, existing municipal, county, and state boundaries might have to be ignored, not to mention the boundaries of national parks and monuments.

Both the feasibility and desirability of such an approach seem questionable. It is highly unlikely that existing political jurisdictions or political bodies would be willing to cede their authority to new jurisdictions or political bodies. In contrast, even if authorities were willing to cede authority, some governmental entity would have to decide the boundaries of the new jurisdiction. Would counties be willing to give this responsibility to Federal officials, or, alternatively, would Federal land managers be amenable to inclusion of national parks or monuments in the same regions as massive oil-shale facilities? Both common sense and political reality suggest otherwise. What seems most likely is significant pressure to respect existing political jurisdictions, despite the justification that might exist for meteorologically based airsheds.

Second, if issues of airshed boundaries could be resolved, the new jurisdiction would still be without political authority (as opposed to statutory authority). Who would organize the new political entity, and how would decisions about representation be made? If groups of counties formed individual airsheds, problems of organization and representation might be easily resolved. For example, in the Rocky Mountain region, with the presence of many Indian tribes and Federal jurisdictions, such as the Forest Service, the National Park Service, and the Bureau of Land Management, the prospects of an easy resolution are remote.

Perhaps of significant importance is the fact that local governmental officials or representatives might not have legal authority over the Federal Government or its agencies. Thus, decisions affecting Federal lands might need the consent of the appropriate Federal official. Put in other terms, Federal officials might be able to exercise a veto over proposals affecting their lands. If such lands were in distinct clusters, a remedy to the problem might be possible. As anyone familiar with ownership patterns in the Western states is aware, however, the distribution of ownership among private, state, and Federal interests is a veritable patchwork.

Assuming that the problems of representation could be overcome, another important issue in terms of marketable permits focuses on how portions of a ceiling would be allocated. At least a half-dozen methods are possible (for example, lottery, market purchase, technical-control potential, likely contribution to employment, first-come first-served), but each of these raises key questions about equity and the role of government bodies. If allocations

are sold to the highest bidders, as is frequently proposed, governmental authorities might not have any control over who purchases the allocations. Similarly, such a system could advantage companies with readily available capital at the expense of companies that are presently short of capital, but whose product might be highly desirable (for example, oil shale). Another allocation scheme, first-come first-served, could vitiate entirely long-range planning by local governments because of limited control over what the pollution sources might be.

Finally, pollution permits suffer from a lack of familiarity and understanding on the part of policy makers and pollution control authorities. In essence, these people are unlikely to be enthusiastic about something as unfamiliar as pollution permits.

Although a lack of familiarity characterizes reactions to pollution permits, this is not the case with refundable deposits. Two states, Oregon and Vermont, have had beverage-container deposit laws for several years, whereas Maine, Iowa, Michigan, Delaware, and Connecticut have added these laws more recently. Oregon's law has had notable effects on the amounts of litter and solid waste. Since it became effective in October 1972, use of refillable containers in the state has increased substantially to the point that 90 % of all beverage containers are refillable.[6] The state's law has also produced more uniformity in the use of beverage containers (reusable 11-ounce stubbies predominate in beer sales, for example). The law has not been without its costs. While reducing litter, it has imposed additional costs (through reduced output) on container manufacturers, increased handling expenses for distributors and retailers, and has caused some inconvenience for consumers who must store and return the containers.[6]

Despite these experiences, the advantages seemed sufficiently compelling to the staff of the Federal Government's Resource Conservation Committee, a special interagency group established as a result of the Resource Conservation and Recovery Act of 1976.[8] In its report, the staff said that legislation requiring a mandatory national system of deposits on beverage containers would significantly reduce litter and solid waste, reduce disposal costs, conserve vast amounts of steel and aluminum, prevent air and water pollution associated with can and bottle production, and prevent the consumption of up to 61,000 barrels of oil per day.[9] Whether similar kinds of advantages would apply to refundable deposits related to air pollution is uncertain. The possibility of such deposits is still novel, and this probably will work against their quick adoption and widespread use.

Conclusions

Several conclusions can be derived from the paper. Market incentives, though appearing very desirable in theory, face considerable problems in implementation to any great extent in the foreseeable future. The problems can be categorized into three general areas: economic, political, and geographical.

Economically, the issues include determining the kind of market interaction to use and the resultant impacts on the polluter and final product. Economists are really not sure beforehand that the adopted market mechanism will necessarily produce the desired behavior on the part of industry.

Politically, there are the issues of power and acceptance. Will legislative tax committees delegate their authority to set taxes to administrative agencies, which, from an efficiency-enforcement standpoint, may be the best thing to do? Both the public and private sectors feel the current system is working reasonably well. Is there a reason to temper or change something that is known and working for the unknown? President Reagan may require that proposed rules and regulations be subjected to cost-benefit analysis before implementation. However, such a pronouncement is a long way from using market mechanisms in lieu of regulation.

Finally, there are the regional or geographical issues. Different, but regionally applied, market incentives may pit one region against another in attracting industry. Problems may occur if there are multiple jurisdictional entities within the same region. It is highly unlikely that existing political or jurisdictional bodies would cede authority to each other or to a new political entity.

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