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Significant issues for environmental policy and air regulation for the next decade

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1. Introduction

This conference focuses on air pollution and other environmental problems that affect the Adirondack region. I wish to stand back from that focus, and ask, from the perspective of economics, what are the fundamental questions that will confront environmental policy in the United States as we move into the next century. I believe there are three central questions, all variants of the following: what is the appropriate role of the government? Those three questions are: what is the appropriate degree of government activity; what form should that activity take; what level of government should be delegated responsibility? Now, in a brief presentation such as this, I cannot provide definitive answers to these difficult and complex questions. What I will try to do, however, is define the questions clearly, and suggest criteria that can be used within a political context to evaluate responses.

2. First question: what is the appropriate degree of governmental activity in environmental policy?

So, first, what is the appropriate degree of government activity in the environmental realm? In real world environmental policy, this abstract question becomes how stringent should our environmental goals and standards be? For example, should we cut back on sulfur dioxide (SO_2) emissions by 10 million tons, would an 8 million ton reduction be sufficient, or would a 12 million ton reduction be better? In other words, how clean is clean enough? How safe is safe enough?

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We have limited resources to spend on regulations and there are other things we care about besides acid rain. We care about other environmental problems, and in addition to the environment, we care about many things, such as food to eat and clothes to wear. This means that the limited resources we have imply that there are trade-offs that affect the kinds of social investments we can make. We simply cannot make all the social investments that have benefits associated with them. So, from an economist's perspective, the answer to this question at first blush seems relatively simple: regulate until the incremental benefits of regulations are just offset by the incremental costs. But, in practice, of course, it becomes much more difficult, in large part because of the inherent problems of measuring benefits, and to a lesser degree, in measuring costs. Further, concerns about fairness and process are important economic or non-economic factors that merit consideration.

There is little doubt that a reallocation of expenditures from current practice to achieve our many environmental goals would have the potential, in the case of human health, of saving significant numbers of lives while using fewer resources. The estimated cost per statistical life saved varies across regulations by a factor of more than 10 million. A reallocation of efforts among priorities could save the same number of lives at much lower cost, or if you prefer, at the same cost we could save vastly greater numbers of lives.

Over the years, policy makers have sent very mixed signals regarding the use of benefit/cost analysis in policy evaluation. Congress has passed several environmental statutes that effectively preclude the Administrator of the US Environmental Protection Agency (EPA) from considering benefits and costs in developing the levels at which certain standards are set, while other statutes under which EPA operates actually require the use of benefit/cost analysis. At the

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same time, Presidents Carter, Reagan, Bush and Clinton all introduced formal procedures for reviewing the economic implications of major environmental regulations. In each and every case, benefit-cost analysis was the yardstick of choice.

On the other hand, benefit/cost analysis has rarely been used by legislators or regulators to help set the stringency of environmental standards. The politics of environmental policy have favored very different approaches to setting standards, such as those embraced by the Clean Air Act: e.g., set the standard to protect the most sensitive members of the population with an adequate margin of safety. Economists and legal scholars have long argued that such criteria are neither reasonable nor well defined, but little has changed.

You will recall that a major part of the Republican 'contract with America' was a regulatory triad that included a bill that would have made meeting a benefit/cost test a necessary condition for a broad set of regulatory actions, including those that were already enacted by statutes. That bill, of course, was defeated in the Senate, and it would have, in any event, faced a certain veto by the President. But Congressional efforts at generic regulatory reform continue, as in the Thompson–Levin Bill in the US Senate. And it is likely that there will be periodic attempts to introduce benefit/cost tests into individual environmental statutes when they are enacted for the first time, or when they come up for periodic re-authorization.

Importantly, proposals for this flavor of regulatory reform, comparing benefits and costs when allocating funds and deciding priorities, have been finding much more receptive audiences in the states. Indeed, as of 1997, some 30 states reported very significant environmental reform efforts coming out of their legislatures.

That is my brief outline of the first of what I believe are the three important questions that environmental policy makers will have to face as we move into the next century, the question of how to evaluate environmental regulations in regard to their benefits and costs.

3. Second question: in what form should government involvement be?

Now I turn to the second of the three major questions for environmental policy, and it is this: once the goals and standards are set for any environmental problem, whether it is on an economic basis, as with benefit/cost analysis, or whether it is on a political, ethical, or religious basis, policy makers are still left with another question: what form should government involvement be? In other words, what means, what policy instruments should be used to achieve the established ends?

Economists have consistently urged the use of market based instruments, principally, pollution taxes and tradable permit systems, rather than command-and-control instruments, such as design standards and uniform performance standards. At least in theory, market-based instruments have the advantage of being cost-effective, that is, they can minimize the aggregate cost for industry and hence for consumers of achieving some given environmental target. Importantly, they also provide dynamic incentives for the adoption and diffusion of cheaper and better control technologies. This is why, in the case of economy-wide, long-term problems such as global climate change, virtually no one seriously considers anything but market-based approaches in real policy deliberations.

Despite these advantages, market-based instruments have been used much less frequently than command-and-control standards. But, gradually, the political process has become more receptive to market-based instruments. Beginning in the 1970s, EPA offered states the option under the Clean Air Act of employing (quite flawed) variants of tradable permits for the control of localized, 'criteria' air pollutants. And more significantly and more successfully, tradable permit systems were used in the 1980s to accomplish the phase-down of leaded gasoline, which I take to be the great success story of the modern era of environmental regulation, as well as the great success story of market-based instruments. So the phase-down of leaded gasoline, accomplished through a tradable permit system among refineries, removed leaded gasoline from the market faster than what could otherwise have been done and at a savings of about US$250 million per year to consumers. In addition, to facilitate the phase-out of ozone-depleting substances (chlorofluorocarbons), to implement stricter air pollution controls in the RECLAIM program in Los Angeles, and perhaps most important of all, to control acid rain under the Clean Air Act Amendments of 1990, tradable permit systems were successfully employed. This last program, the trading of SO_2 emission allowances to reduce acid rain, is estimated to be saving the nation about US$1 billion per year in compliance cost, while achieving the statutory goal more quickly than could have been done with a conventional approach. Given the historical lack of receptiveness to these ideas for the preceding 25 years in the modern era of environmental protection, we might ask why has there been a relatively recent increase in interest in these approaches?

As a professional researcher and teacher, I would find it gratifying to believe that the explanation for this increased acceptance politically has essentially been increased understanding of market-based instruments among the politically relevant players. But how

important has this really been? In 1981, a colleague of mine, a political scientist at the Kennedy School, Steven Kelman, surveyed Congressional staffers and found that support and opposition for market-based environmental policy instruments was based principally on ideological grounds. Republicans, who supported the concept of economic-incentive approaches, offered as a reason the assertion that 'the free market works' or 'less government intervention is desirable', without any real awareness or understanding of the real economic arguments for or against market-based environmental instruments. Likewise, Democratic opposition, at the time, was largely based upon ideological factors linked with little or no apparent understanding of the real advantages and disadvantages of these instruments.

What would happen if we were to replicate Kelman's survey today? My refutable hypothesis is that we would find increased support from Republicans, greatly increased support from Democrats, but insufficient improvements in understanding to explain the tremendous changes that have taken place and the positive reception that these ideas have begun to receive in Washington and throughout the United States. What else has mattered?

There are at least seven factors that help explain the changed political reception. The first is that pollution control costs increased, so that policy makers began to question whether command-and-control regulations could produce further gains in environmental quality. During the previous 20 years, pollution abatement costs had continually increased, as stricter standards moved the private sector up the marginal cost curve. By 1990, US pollution control costs had reached, just for Federal regulations, about US$125 billion annually, a 300% increase in real terms compared with 1972 levels.

Second, a factor that became important in the late 1980s was strong and vocal support from some segments of the environmental community. In particular, by supporting tradable permits for acid rain control, the Environmental Defense Fund (EDF) effectively distinguished itself from other groups. When the Clinton/Gore administration began, most environmental groups had difficulty in fund-raising, because of the absence of a well defined enemy in Washington. EDF continued to prosper.

Third, note that the SO_2 allowance trading program, the leaded gasoline phase-down, and the CFC phase-out were all designed to reduce emissions, not simply to reallocate those emissions cost-effectively among sources. Market-based instruments are most likely to be politically acceptable when they are proposed to achieve environmental improvements that would otherwise not be feasible.

Fourth, deliberations regarding the SO_2 allowance system, the lead phase down, and CFC trading differed from previous attempts by economists to influence environmental policy in a very important way: means were separated from ends. That is, consideration of goals and standards were distinguished from the design of policy instruments used to achieve those standards. By accepting politically identified acid-rain reduction goals in 1990, it was possible to focus on adopting a cost-effective means of achieving that goal. Of course, the danger then and always of focusing on cost-effective means and accepting politically defined goals is the risk of 'designing fast trains to the wrong station'.

Fifth, acid rain was essentially an unregulated problem until the SO_2 allowance trading program of 1990; and the same can be said for leaded gasoline and CFCs. Hence, there were no existing constituencies in the private sector, the environmental advocacy community, or in the government. There were no constituencies for the *status quo* approach, because there *was* no *status quo* approach. The message here is that we should be more optimistic about introducing market-based instruments for 'new problems', such as global climate change, than for existing, highly-regulated problems such as abandoned hazardous waste sites.

Sixth, by the late 1980s, there had already been a perceptible shift of the political center towards a much more favorable view of using the market to solve social problems. The Bush administration, which proposed the SO_2 allowance trading program and then championed it through an initially resistant Democratic Congress, was, at least in its first two years in office, a 'moderate Republican' administration. Phrases such as 'fiscally responsible environmental protection' and 'harnessing market forces to protect the environment' do have the ring of quintessential moderate Republican issues. But, beyond that, support for market-oriented solutions to various social problems had been increasing across the political spectrum for 15–20 years, as evidenced by deliberations and decisions made on the deregulation of the airline, telecommunications, trucking, railroad, and banking industries. Indeed by 1990, the concept or at least the language, 'market-based environmental policy', had been transformed from politically problematic to politically attractive.

Seventh and finally, the adoption of the SO_2 allowance trading program for acid rain control, like any major policy innovation, can partly, if not largely, be attributed to a healthy dose of chance that placed specific persons in key positions C in that case, at the White House, the Environmental Protection Agency, the Congress, and some key environmental organizations. The result of that set of coincidences, and the other factors I have described, was what may be

thought of as the 'golden era' for market-based environmental strategies.

4. Third question: what level of government shall be delegated responsibility or authority?

Having first considered the ends of environmental policy, and second, the means, the policy instruments of environmental policy, I now arrive at my third and final question that will be paramount as we move into the next century of environmental policy: what level of government should be delegated responsibility and authority? Should it be local, state, regional, federal, multi-national, or global? There is no single answer, of course. Even from the relatively narrow perspective of economics, the answer depends very much upon specific characteristics of individual environmental policy problems.

Unfortunately, the debate on this question has often been confused, and significant mistakes have been made in identifying appropriate levels of government activity. The beginning of the modern era of environmental policy, the first Earth Day in 1970, also marked the beginning of major involvement by the Federal government in environmental protection. At that time and since, two principle arguments have been made in favor of a strong Federal role: first, that in the absence of national controls, states would compete with one another economically by lowering their environmental standards in a so-called 'race to the bottom'; and, second, that many environmental problems are interstate externalities and, as such, cannot be efficiently regulated by individual states. I examine those two rationales in turn.

First, the race to the bottom rationale has been invoked explicitly and frequently in Congressional debates since 1970. The theory maintains that if left to their own devices, states and localities will attempt to induce firms to locate or relocate within their boundaries in order to benefit from private and public economic rewards by offering firms excessively lax environmental standards. This argument, which apparently continues to be compelling to political leaders, is both theoretically flawed and empirically invalid.

In terms of theory, individual jurisdictions can have incentives to set standards efficiently despite the significant mobility of capital because *individuals* are *also* mobile. They may move in search of jurisdictions with favorable levels of environmental quality. It is certainly possible, however, that in particular instances interstate competition could take on the structure, in game-theoretic terms, of a 'prisoner's dilemma'; that is, states might be driven by fears of what other states might do to choose environmental standards that are undesirably lax. But it is equally plausible under other conditions, that strategic behavior by states would lead to standards that were excessively strong, because of concern about what other states were going to do in terms of attracting citizens. Finally, even if states did systematically adopt excessively lax standards, there is no reason to assume that Federal environmental regulation will automatically improve upon the situation, because states may then compete in other regulatory spheres, or in terms of fiscal conditions.

Beyond theoretical arguments, the reality is that the race to the bottom argument is empirically invalid. A large number of statistical studies have examined this, and there is no evidence that firms move their plants or establish new ones in response to differences among jurisdictions in their environmental standards. The major reason is that differences in environmental compliance cost across jurisdictions, even internationally where the differences are much greater, are trivial compared with other differences that firms care about, principally, costs for labor and, secondarily, costs for conventional capital.

Now we turn to the second rationale for a dominant Federal role in environmental regulation, namely, that many environmental problems are interstate externalities and, as such, cannot be efficiently regulated by individual states. In cases where such externalities exist, this can indeed be a sound argument for Federal primacy, assuming, of course, that states cannot engage successfully in negotiations. But actual Federal regulation has done relatively little to mitigate these interstate externalities; and, in some cases, it has actually exacerbated them.

We would anticipate a strong Federal role for those environmental problems that are characterized by the interstate movement of pollutants. But highly localized environmental problems, including hazardous waste sites and local air pollution are actually among the most strictly regulated by the Federal government. In actual implementation, the Federal role is considerably weaker under those parts of the Clean Air Act that arguably cover interstate pollution. The National Ambient Air Quality Standards are not targeted to address interstate air movements. And the Act and the emission standards focus exclusively on emissions from individual sources, placing less constraint on numbers or locations of sources. Furthermore, as is now well known, the Ambient Standards gave strong incentives for sources to increase their stack heights, and for states to encourage them to do so, thereby increasing long distance transport of air pollution. Because of this, it is not an exaggeration to state that the Clean Air Act, as developed in the 1970s, was a principal cause of what subsequently came to be known as acid rain.

On the other hand, the interstate externality argument is very strong in this case of acid rain, a problem

which clearly would never have been addressed by the SO_2 emitting states in the Midwest, and clearly never *could* have been addressed by the acid rain receiving states in the Northeast and the Middle Atlantic region. The Federal response in the Clean Air Act Amendments of 1990 was appropriate. Likewise, there is a sound interstate externality argument for Federal involvement in the case of some ecological concerns, such as endangered species, that exhibit significant non-use values held by out-of-state residents.

As with the first two questions I addressed, there is no single answer to this third question of the appropriate level of government authority. Indeed, when single answers are proposed, either for or against Federal primacy, it is likely that the thinking behind the proposals is ideological, not analytical.

5. Conclusion

That is my thumb-nail sketch of what I believe are the three fundamental questions for environmental policy as we move into the next century: what is the appropriate degree of government activity; what form should that activity take; and what level of government should be delegated responsibility? In a presentation such as this that poses questions but provides only preliminary answers, it is not an easy task, nor a wise one, to draw conclusions.

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Dr Stavins works closely with public officials on matters of national and international environmental policy, and has been a consultant to National Academy of Sciences, World Bank, United Nations, U.S. Agency for International Development, members of Congress, state and national governments, and private foundations and firms. He directed Project 88, a bi-partisan effort co-chaired by former Senators Timothy Wirth and John Heinz to develop innovative approaches to environmental and resource problems. Dr. Stavins holds a B.A. in Philosophy from Northwestern University, an M.S. in Agricultural Economics from Cornell University, and a Ph.D. in Economics from Harvard.