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Does Environmental Regulation Equal Environmental Protection? How Current Environmental Policy is Failing

By Robert H. Nelson

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There are, as I will be examining in this talk, many problems with the way we make environmental policy. But before I examine the problems, it may be useful to say a few good things. It is important to keep in mind that, on the whole, the American environment is much cleaner than many other environments around the world. Eastern Europe is a place that has major environmental problems. The United States is also far better off than Mexico and most of the undeveloped countries of the world.

In fact, many people make the point that the superior quality of the American environment is one of the signs that capitalism and the American system work better than other systems. But you cannot then turn around and say that environmental policy in America has been totally unsuccessful.

It is American political institutions that gave the American public ample opportunity to express a strong preference for greater environmental amenities. The American market system gave us the substantial wealth to be able to respond and to have cleaner air and water, more parks, more protection of rare species, and so forth.

Failing Policy. Yet my overall verdict is that current environmental policy is failing. The first problem is the extremely high cost. It is a good thing we are a wealthy nation, because that is the only way we have been able to afford these costs. Moreover, the costs of environmental protection are rising rapidly.

The EPA in December of 1990 published figures on the total U.S. costs (public and private) for all pollution control activities. These figures show that we spent about $30 billion for pollution control in 1972, this rose to $98 billion in 1987, and then again to $115 billion in 1990. EPA also made the projection that in the year 2000 the total cost of pollution control will be between $171 billion and $185 billion (1990 dollars).

Trend of Growing Cost. As a percentage of GNP, pollution control will have risen from taking less than 1 percent of GNP in 1972 to more than 2.5 percent in the year 2000. If current trends continue, it would not be very surprising to see a situation in which EPA commands more resources of the American economy than the Defense Department.

True enough, most of the environmental spending is by private industry and others who are responding to EPA mandates, and not by EPA directly. But this is not a critical difference.

I might add that at the Interior Department there are large and growing costs associated with environmental protection activities. The costs of protecting the spotted owl, if current plans are maintained, are likely to be in the range of $20 billion to $30 billion. That is lost net economic value due to trees and potential timber harvests left on the stump, or what economists in technical jargon would call lost "rent."

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The expected net economic cost—not the gross which is much larger—of keeping oil drilling out of the Arctic National Wildlife Refuge is likely to be about $15 billion to $20 billion. That comes to a one-time cost of about $300 for every family of four in the United States.

So what are we getting for our very large and steadily rising investment in the environment? I will take up first what is perhaps the single most prominent area of environmental policy, air pollution control. The smog in Los Angeles has probably done as much as any one thing in America to heighten environmental awareness. I will discuss air pollution, partly because it illustrates many of the problems we are facing today.

Significant Improvements. Let us first go back before the Clean Air Act of 1970. There was in fact already considerable effort then being made to clean up the air. According to EPA data, from 1960 to 1970 particulate levels fell by 22 percent at 95 sites around the United States. From 1966 to 1971, sulfur dioxide levels fell by 50 percent at 31 monitoring sites. So there were significant improvements being made, and I would venture to say that a lot of these were fairly inexpensive, especially compared with the cost of gains in the 1970s and 1980s.

Then in 1970 the Clean Air Act imposed a whole new regime with much more central control, to be imposed by the newly created Environmental Protection Agency. The level of spending on air pollution control began to rise sharply, for the U.S. as a whole going from $8.0 billion in 1972 to around $30 billion in 1990.

And all this again produced some useful results. Particulate loads nationwide fell again by more than 50 percent from 1970 to 1990. Levels of lead in the air have fallen by more than 90 percent since 1980. And there have been declines in levels of sulfur dioxides and carbon monoxides.

Benefits Compared to Costs. How does all this play out in terms of the benefits compared with the costs? It is clear that estimating a dollar value will not be easy. It requires us to put dollar figures on days of work that are not lost, on deaths that are avoided (or, more accurately, deferred), on aesthetic improvements, and so forth.

Nevertheless, there is no getting around it. We either do a benefit-cost analysis explicitly, or we do the analysis implicitly.

Now in the judgment of some respected analysts, the best available calculations of benefits from the Clean Air Act were done by Professor Myrick Freeman. Using 1978 as his benchmark year for examining benefits, Freeman came up with a most-likely estimate of around $37 billion in benefits in that year (1984 dollars).

Getting a Good Deal. EPA recently published figures showing that air pollution control costs in 1978 were about $16 billion (1986 dollars). So it is at least a reasonable possibility that we have been getting a good deal here. If we accept Freeman's analysis, the benefits may even have been twice the costs.

Of course, these costs perhaps were much higher than they needed to be, but at least the benefits covered them—or so this analysis concludes. As time goes on, however, it is going to get harder to get further improvements in environmental quality. The law of diminishing returns applies to the environment as well as to other areas of life.

And this is especially relevant in light of the fact that we have just had a new Clean Air Act passed in 1990. It proposes to undertake some fairly heroic and extremely costly measures to clean up the air. In fact, it seems that the new Clean Air Act will eventually more than double the 1990 spending of around $30 billion for clean air.

Paul Portney of Resources for the Future in 1990 published some estimates of the benefits and costs of this new spending. In my opinion, Portney is as close to being a neutral party as can be expected on this kind of benefit-cost assessment. His conclusions were somewhat disturbing.

The 1990 Clean Air Act addresses three main areas: acid rain, urban air pollution controls designed to limit smog, and hazardous air pollutants. Portney acknowledges that the impacts of acid rain on lakes and forests turned out to be a lot less severe than many people originally had thought. It took $500 million of federal money, but the National Acid Precipitation Assessment Program (NAPAP) study did establish that to reasonable satisfaction.

Aesthetic Benefits. Nevertheless, it turns out that sulfate particles may have some bad effects on human health. There also may be some aesthetic benefits in terms of visibility from reducing sulfur. Portney takes a rough stab that the total benefits, mostly in possible health and visibility gains, will be in a range of $2 billion to $9 billion per year.

The cost of the 10 million-tons-per-year sulfur reduction mandated by the 1990 Act will be around $4 billion to $5 billion per year. So, almost fortuitously, it is at least possible that we will do all right with our acid rain program—although it is also possible that we are spending more than it is worth.

But that is the good news. Considering smog control under the new Act, Portney estimates benefits in the range of $4 billion to $12 billion per year. It is hard to control smog, and the new program is certainly not going to eliminate it. So the marginal benefit may not be that great. Portney's estimates of costs are in the range of $19 billion to $22 billion per year. So costs easily could be twice as large as the benefits.

He reaches a similar conclusion for hazardous air pollutant controls. The estimated range of benefits could be as low as zero. As I will discuss later, we simply do not know a great deal about risks from hazardous substances. And Portney suggests the upper bound of benefits is $4 billion per year.

However, by comparison, Portney estimates costs of around $6 billion to $10 billion per year. So if these estimates are accurate, and I know other well-informed people who do not dispute the general thrust, we are going to be spending a lot on the removal of emitted particles and chemicals from the air that is of very questionable benefit to us.

Questionable Benefits. And these costs for the Clean Air Act do not include the inhibitions to business innovation, the procedural delays, the intensified bureaucratic oversight, and other burdens that may also be significant. It looks as though the 1990 Act may well introduce a whole new ball game of government micro-management and second guessing of business decisions.

So far, I have been talking quite a bit about clean air. Basically, the message is that we may have spent a lot more than necessary and done some foolish things, but we did get some important and worthwhile benefits from the 1960s into the 1980s. However, we are getting into areas now where our air quality efforts are becoming increasingly problematic.

I am going to turn now to another area of major importance in the battle for a cleaner environment. That is water pollution control. Unfortunately, what I will have to say is not especially favorable. It looks as though, right from the beginning following the passage of the Federal Water Pollution Control Act 1972, we may have been making expenditures of questionable justification.

Again, Professor Myrick Freeman made some well-regarded estimates for the benefits of the Clean Water Act. For 1978, he calculated benefits in that year of around $14 billion (1984 dollars). The same year the cost of the Clean Water Act, as shown by recent EPA figures, were

about $21 billion (1986 dollars). So there is considerable doubt about whether we were getting our money's worth even then.

Why is this? What is the difference from the early air pollution efforts? I can offer several answers.

First, water pollution controls are very costly. EPA is now projecting costs of over $60 billion per year in the year 2000. This is partly because we tend to impose a uniform set of tight standards all across the United States.

Already Reasonably Well Off. Yet a lot of our waters were already in pretty good shape in 1972. According to the Conservation Foundation, 64 percent of stream miles and 84 percent of lakes and reservoirs were able to support all expected uses in that year. We are spending a lot of money to clean up water bodies all across the United States that are already reasonably well off.

This helps to explain why we have had a very lackluster rate of improvement in water quality since 1972. By and large, there has hardly been any improvement at all.

Let me quote from one of EPA's own publications. According to the authors, "The broadest statistical analysis of water quality trends found no clear nationwide improvement over the period 1974 to 1981.... Far more [monitoring] stations showed no statistically significant change than showed an improving or worsening trend." And the decade of the 1980s does not seem to have been much different.

Our water pollution strategy has been flawed in another basic way. Under the Clean Water Act, a large part of our water pollution control is directed at what are called point sources. These are facilities like factories, power plants, and municipal sewage plants. They are easy to identify and easy to regulate. They are also often big business, which makes them easy and inviting political targets.

Unfortunately, they do not happen to cause most of the water pollution. EPA estimates that only 9 percent of our impaired river miles are being affected by industrial plants. Even sewage treatment plants affect only 16 percent of impaired river miles. By contrast, agriculture affects 55 percent.

Our real water pollution problem today is a non-point source problem. But we have a water pollution control strategy directed to point sources. Again, let us listen to what EPA's own reports have to say: "Most types of nonpoint sources have proven far more difficult to control than point sources primarily because a command-and-control regulatory approach is difficult to implement for them. Nonpoint source dischargers are numerous and widespread, and are difficult to identify, monitor, establish control requirements for, and enforce against." They are also politically powerful.

Symbolic Benefits Mainly? So instead we spend huge amounts to control point sources but do not get much actual improvement in water quality. Maybe we could say that what we get are symbolic benefits. Maybe we feel better by trying hard, even if we do not succeed. Unfortunately, there seems to be a lot of that kind of thinking in the environmental area.

As I mentioned above, air pollution control initially seems to have been more successful than water pollution control. But we may now be getting into a situation where new efforts to control air pollution will be encountering problems as great as we have been seeing over the last two decades in the water area.

Certainly we have gone about regulating air as well as water quality in a very rigid, command-and-control way. By applying the same standards all across the nation, and by mandating technology-based requirements on everybody, we have sharply driven up costs.

Economists like to point out that under market-based systems the polluters who could reduce emissions most cheaply would do so. Instead, our approach has been to try to force everyone to reduce, whether it is easy for them or extremely difficult. It is as though pollution is a sin and everybody has to stop sinning.

I might point out that even a command-and-control system could be a lot more flexible and could thereby save large amounts of money. For example, EPA could require that everyone has to reduce a type of pollution as long as the reductions cost less than so many dollars per ton. A company could then avoid reducing pollution further by showing the EPA that it would be too expensive and thus cost ineffective. If this did not result in enough pollution being curbed overall, EPA simply could raise the dollar figure per ton that would get the producer out of further EPA control.

Potential for Savings. In any case, preferably by a system of market pricing of pollution, but alternatively by a command-and-control approach, the potential for cost savings in greater flexibility is very large. Let me quote from the 1989 annual report of the Council of Economic Advisors (CEA). It observes that "regardless of one's view of the value of environmental improvement, EPA's rigid regulatory strategy has clearly wasted a substantial portion of the Nation's investment aimed at improving air quality." Continuing further, the CEA reports that "the cost of air pollution control during the 1980s has averaged more than $30 billion annually, and economic studies indicate that more cost effective pollution control strategies could have achieved the same degree of environmental quality for billions less."

Another basic problem is that EPA has typically tried to mandate national solutions even where regional and local circumstances might dictate highly variable approaches. The problem was highlighted recently by a revealing study produced by a committee of the National Academy of Sciences, a study mandated by the Clean Air Act of 1990.

The NAS study, which was released in December 1991, addresses the problem of smog, or, more technically speaking, of ozone, which some people might say is our single greatest environmental problem today. (It is certainly our most "visible.") The National Academy of Sciences reported that "despite the major regulatory and pollution-control programs of the past 20 years, efforts to attain the National Ambient Air Quality Standard for ozone largely have failed." I might note this has been at a huge cost, including most recently further costs of at least $10 billion per year under the provisions of the new Clean Air Act.

Startling Developments. The existing control strategy has emphasized reducing what are called volatile organic compounds, or in the jargon of the trade, "VOCs." Unfortunately, the National Academy study revealed some rather startling developments. For one thing, it has fairly recently come to light that VOCs are also generated in substantial magnitudes by natural vegetation. In fact, the NAS study observed that naturally occurring sources of VOC, in combination with man-created nitric oxide and nitrogen dioxide, could cause significant violations of existing smog standards.

So we could spend billions to reduce further emissions of VOCs from cars and factories, but in some areas it would not do any good. Operating under existing regulatory strategies, however, we have not been as concerned with nitrogen oxides.

In fact, the situation is apparently quite complicated. The National Academy study states that the appropriate control strategy can depend significantly on what is called the VOC/nitrogen oxide ratio. For ratios in one range you need to reduce nitrogen oxides; in another range you might actually need more nitrogen oxides to curb smog. And this ratio is variable from one place to another in the United States. So our centralized national approach to smog apparently has been too rigid and sometimes counterproductive.

The NAS study revealed some other bothersome matters. First, our measures of actual ozone trends within metropolitan areas are unreliable. Often, we do not know what is really happening out there. Second, our predictive computer models for ozone levels do not work very well, yet we base our strategies partly on these models.

Third, our control strategies even for anthropogenic (human created) VOCs have failed to deliver the VOC levels promised. Apparently, they were based on some unrealistic assumptions. Larger actual VOC emissions from mobile sources than had been factored into calculations, for example, have been a big problem. Summing it up, we basically do not seem to know enough now to design an effective and well-crafted strategy to reduce smog.

And this, of course, is 22 years after the EPA was created and the first major national Clean Air Act passed. For me, all this illustrates one of our major problems, that we do not do enough science before jumping to conclusions.

At this point, I am going to switch gears again and address the third major area of pollution control. This is a broad area that includes hazardous and solid wastes, superfund, toxic substances and pesticides.

The Big Three. Looking at total public and private pollution control costs in 1990, we see they break out about this way. Air pollution got almost 30 percent of the $100 billion total spent throughout the United States. Water pollution got about 40 percent. And the various waste, chemicals, and toxics programs got about 30 percent. These are the big three.

The waste and toxics problems are the ones that really make people nervous, because they are the ones that could involve some major threats to human health. In fact, a lot of the public anxieties are associated with that most fearsome threat of all, the possibility of getting cancer. It is also in this area that we have had some of the most questionable scientific practices. When you combine poor science and public hysteria, the result can make the regulation of air quality and of water quality seem to be models of sober-minded practicality and rationality by comparison.

Garden of Eden Theory. The scientific problems of testing for cancer-causing agents have become well known by now, at least in Washington policy circles. For a while we had what Edith Efron called the Garden of Eden theory of cancer. Nature in its original state of pureness and innocence could not be imaged to have yielded something as evil as cancer. It was only fallen men with their penchant for greed and the rise of industrial society that could have brought cancer into the world. And as mankind is committed to eradicate sin, it must be committed to eliminating every possible chemical, waste, or other agent that could cause cancer. This helped lead to actions like the 1958 Delaney amendment, whereby Congress said that any food additive causing cancer in any test must be banned by FDA.

Moreover, the way to tell if something causes cancer would be to subject animals to massive doses and then to see if cancer rates among these animals rise above normal levels. Yet, however good the original intentions, and however sincere the early scientists, all this turned out to be little better than scientific quackery.

Professor Bruce Ames of Berkeley was one of those who originally was a leading developer of tests to identify cancer-causing agents. For many years he has been one of the leading scientists in the world in this field. But somewhere in the 1980s he decided that what we were doing was radically in error. This is what Ames now has to say:

> The attempt to prevent cancer by regulating low levels of synthetic chemicals by using worst-case, one-in-a-million risk scenarios is not scientifically justified. Testing chemicals for carcinogenicity at near-toxic doses in rodents is misleading, enormously costly, and counter productive.

> It diverts resources from much more important tasks.... Perversely, it decreases consumption of foods that help to prevent cancer.

Ames goes on to say that "plants produce toxins to protect themselves against fungi, insects and animal predators....We estimate that Americans eat about 1.5 grams of natural pesticides per person per day, which is about 10,000 times more than they eat of synthetic pesticide residues."

Evolving Theories. So the fact is that our knowledge of what causes cancer is much like our knowledge of what causes smog. It is evolving rapidly, previous leading theories have recently been cast aside, and it is on the whole shockingly incomplete when one considers the regulatory burdens that are being placed on it. We are in fact spending large amounts to eliminate supposed cancer-causing agents that may well be perfectly harmless.

Then, to compound matters, even if some cancer really is being caused, the expenditures we are making in some areas are also totally disproportionate to the risk. In a recent paper Lynn Scarlett of the Reason Foundation cited an EPA and OMB calculation showing that new landfill regulations would save one life for the expenditure of $20 billion. Think of what you could do in our inner cities, or in say Africa, with $20 billion. You could not only save a lot more than one life, but you could generate vast additional benefits to boot.

In its latest 1992 Annual Report, the Council of Economic Advisors had this to say:

> Before 1985, only two regulations exceeded a cost of $100 million per death averted. Eight such regulations have been enacted since that time. EPA's rule regulating wood-preserving chemicals, while not large in total costs, is estimated to avert only one case of cancer every 2.9 million years, and cost at least $5 trillion dollars per death averted.

Horror Story. Of course, you can have regulations like this one only where they are not applied very widely and do not have very much impact. If they were on a large scale, what we would be talking about here would be the spending of one full year's worth of GNP to save one life.

True enough, I have to admit that this qualifies as a horror story. It is an extreme case even in this area of extremes. But a broader and more balanced view still suggests severe problems. Roger Dower of the Congressional Research Service wrote in 1989 in an Resources for the Future (RFF) publication that with respect to hazardous waste regulation:

> The fragmentary evidence to date suggests that with respect to health, at least, the risks are not great. The hazardous waste management program is not the first environmental protection strategy that may involve serious economic inefficiencies, but it may eventually go farther in that direction than any other.

In its hedged and bureaucratic prose, what this is really saying is that we have a big mess on our hands.

As I said before, the only explanation I can see is that we feel better because we are trying hard. Maybe the real benefit is that we are simply doing penance for the evils of modern civilization. In that case, of course, the more you spend, the greater the benefits. It is sort of like buying a Mercedes: the more the car costs you, the more it is worth to you.

This kind of thinking has gotten us into some well-publicized cases in the last few years where we have had initial public hysteria, Congress and bureaucrats running around trying to do some-

thing, starting new programs with huge costs, and then it turns out that there was a big misunderstanding in the first place. In an editorial in *Science* magazine in September 1990, the deputy editor for engineering and applied sciences wrote:

> Stringent regulations and attendant frightening publicity have led to public anxiety and chemophobia. If current ill-based regulatory levels continue to be imposed, the cost of cleaning up phantom hazards will be in the hundreds of billions of dollars with minimal benefit to human health.

Panicky Public. One of these kinds of situations involved asbestos. A panicky public started tearing up schools and all kinds of other buildings all across the United States to remove asbestos. By some estimates we have been spending $3 billion a year on asbestos abatement, a lot of it on removals.

It turns out, however, that asbestos in place typically involves little risk. In fact, tearing it out creates a lot more risk, both for the workers and in terms of particles that remain in the air. So in 1990, after at least tacitly encouraging billions in asbestos overreaction, the government issued a new manual explaining: "Removal [of asbestos] is often not a building owner's best course of action to reduce asbestos exposure. In fact, an improper removal can create a dangerous situation where none previously existed."

Or take another example, the response to the Exxon Valdez oil spill in Alaska. Right after the spill happened, one judge in the case said it was the worst thing to happen in the world since Hiroshima. Exxon reacted to these kinds of hysterical public pressures by going in and literally trying to clean the oil off the rocks and beaches with steam and other crude methods. They did at least pump a couple of billion dollars into the Alaska economy. But a year later, after the panic subsided, the verdict was that it was probably all a big mistake environmentally. After a visit to Alaska, Democratic Representative Wayne Owens of Utah wrote, "I concluded that the value of the massive spill-cleanup effort lies primarily in public relations, not just for Exxon but also for Alaskan and federal officials and for Congress."

Premature Judgments. The alar hoax and the resulting public hysteria created by the Natural Resources Defense Council is one more of these cases. And the whole panic over dioxin is another. However, at least in the case of dioxin, it seems to have been a case of well-intentioned scientists making premature judgments, and then only later realizing they were probably way off the mark.

I have not had time to get into the whole area of what we are going to do with all the wastes—hazardous and otherwise—our society is going to continue to produce. But in any case I would characterize this whole area of toxics and hazardous materials as beset by irrational policy making.

To sum up, what is going on here? Why are our environmental policies failing us so badly these days? I had actually planned to spend more of this speech talking about this aspect. But I will at least list a few of what I see as the major sources of our problems.

First of all, it seems to me that in the final analysis a lot of people do not really care very much about whether we have cleaner air, less cancer, more parks, and so forth. That seems to miss the point of what environmental policy is really all about for them. It is actually about feeling a sense of moral righteousness, a desire to make a commitment to doing something good in the world. Twenty-five years ago such idealism was directed to helping the poor; today it is directed to the environment. Children used to collect money at Halloween for UNICEF; now they collect for whales.

Environmental policy making thus has become something that seems to be more about saving our individual and our collective national souls than it has to do with the practicalities and technical details of the environment. There is a deeply religious element. For those of you who are interested, I have been doing some writing on this and can make it available if you get in touch with me.

Getting Political Clout. Then, given this public mood, the media and the environmental organizations play on it. It is a good way to sell newspapers or boost TV ratings. For environmental groups, it raises money and gives them political clout. It helps to sustain what have now become environmental bureaucracies.

Finally, I would put a lot of blame on the scientific community itself. It does not do enough to weed out its crackpots and seems to think the highest role for a scientist is to be a retiring fellow in a laboratory thinking great thoughts. In my view we need some responsible scientists who are willing to be citizen activists and to get their hands dirty in politics. Bruce Ames should not be as isolated a case as he is.

And, of course, in all this brew there are lots of self-interests at stake and plenty of people happy to pursue them. But that is true of lots of other areas of American life, where policy seems to fare at least somewhat better. So self-interest cannot be the whole explanation.

In the end I do not have any sure answers. But I certainly do think that public education and a more enlightened public opinion are a critical part of the answer. That is a task that perhaps some in the audience here today can assist in.

As far as specific directions for reforming our policies, I will finish up by suggesting a few basic steps.

1) Spend a lot more on science, data gathering, and basic information.

2) Abandon much of the centralization and allow for much greater state and local flexibility —in other words, decentralize both policy and administration in a major way. Maybe this will even mean eliminating current EPA authority having the last say at the state and local level.

3) Instead, let EPA play more of a scientific, technical assistance, informational and coordinating role, rather than issuing coercive mandates as it does now.

4) And, as an economist, I not surprisingly would like to see much more use of markets and especially of tradeable emission permit systems. The recently proposed introduction of a trading system for achieving air quality goals in Los Angeles is a momentous development in environmental policy, and should be watched very closely.

Of course, I realize that all this would amount to a minor revolution in current environmental policy. But we can always hope.

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