Forty Years in an Emerging Field

Economics and Environmental Policy in Retrospect

By Wallace E. Oates

Economics was missing in action during the environmental revolution of the late 1960s, but eventually made its mark on policy. How the discipline became an agent of change in environmental law is a story that isn't over yet.

We have seen a remarkable transformation in the role of economics in environmental policymaking over the past three decades. Coming out of the environmental revolution of the 1960s, the early federal legislation—notably the Clean Air Act Amendments of 1970 and the Clean Water Act Amendments of 1972—essentially ignored economics. In the "command-and-control" (CAC) tradition, this legislation directed environmental agencies to set air and water quality standards with little regard to their economic consequences and then to issue directives to firms for the control of their waste emissions into the environment, often specifying the technologies that were to be used.

Since those early days, however, things have changed in some quite dramatic ways. To take one example, the U.S. Congress under the 1990 CAA Amendments has adopted a wholly different regulatory strategy to tackle the troubling acid-rain problem: a market for tradable sulfur-emissions allowances. Sources throughout the nation are buying and selling entitlements to a limited quantity of sulfur discharges into the atmosphere. This approach is achieving our objective of cutting aggregate emissions in half, but it does so in a way that gives emitters discretion to determine their own levels of both emissions and abatement technology.

More generally, benefit-cost analyses of proposed environmental standards have become a routine part of the regulatory process. Although their role in the establishment of regulatory standards is, in some cases, rigidly circumscribed by existing statutes, such benefit-cost studies figure in important ways in the debate over proposed measures (and in *ex post* reviews of policy as well).

How has environmental policymaking evolved from a process in which economics had so little relevance into one in which it plays a significant role? And what did economists have to do with this transformation? These are fascinating questions, if not easy ones to answer. But let me at least offer some reflections.

Environmental Economics Early-On

If we didn't know better, it would be natural to suppose that economics had been important in the design of environmental policy from the outset. After all, economists were, it might seem, well positioned upon the arrival of the environmental revolution. They had a coherent view of the problem of environmental degradation, one that indicated clearly the nature of

the "market failure" that takes place when economic agents have free access to our scarce environmental resources. Such free access leads quite naturally to an excessive use of resources, resulting in a polluted environment. Moreover, this view of the environmental problem carries with it a direct policy prescription: government needs to introduce the correct "price" in the form of a tax on polluting waste emissions. Such a tax would represent the surrogate price that would induce polluters to cut back their emissions to the socially desired levels.

This perspective on environmental regulation, developed in the first half of the century by A.C. Pigou and others, was embedded in the academic literature by the time the amendments to the Clean Air and Water Acts were under consideration. Basic textbooks provided a standard description of the smoky factory spewing fumes over nearby residences and went on to prescribe taxes on the emissions of the offending pollutants as a corrective measure.

But this approach was completely ignored in the initial round of environmental legislation both in the United States and abroad. Why? My answer to this question comes in three parts. First, there was no constituency for whom the economist's view and policy proposal had much appeal. Environmentalists were decidedly hostile. The market system was the reason we had pollution in the first place, they said. The idea of putting a price on the environment was morally repugnant. Moreover, they argued, it wouldn't work: polluters would simply pay the tax and go on polluting. Environmentalists thus flatly rejected an economic approach (as I learned personally and painfully on several occasions) and called for direct controls on polluting activities.

Industry was not very sympathetic either. The idea of a new tax was, of course, not very appealing. Beyond that, some firms found that environmental controls could actually work to their advantage, because such controls were often much stricter on new industry. Many established firms welcomed the barriers to entry that command–and–control regulation was creating.

Finally, the fraternity of regulators was less than enthusiastic about discarding traditional methods of regulatory control for a largely untried system of taxes on pollution. There really was no one to champion the cause of the economic approach to environmental policy.

The second part to my answer turns to the state of environmental economics itself in the late 1960s and early 1970s. Economics had a view of the pollution problem, but it did not go much beyond a general conceptual level. It is a long way from an equation on the blackboard stating that a tax on each firm's emissions should be set equal to "marginal social damages" to the design and implementation of a workable system of pollution taxes. And few economists were working on these issues. Today there exists an active Association of Environmental and Resource Economists (AERE) with a membership approaching one thousand and with a large and energetic sister organization in Europe. But thirty years ago, only a small number of economists were seriously addressing the hard issues of policy design.

Several of them were at Resources for the Future. Allen Kneese and Blair Bower, for example, published a pathbreaking study of water quality management in 1968 that explored the scientific character of water pollution, studied the actual institutions for regulating water quality, and then turned to the design of a feasible system of fees for the control of waste emissions. But these studies were exceptions. Economists really were not in a position at that time to offer much guidance on the actual design and implementation of systems of environmental taxes.

The third part of my answer (closely related to the second) is the pervasive ignorance of the economic approach to environmental policy outside the economics profession itself. Even as late as 1981, Steven Kelman's survey of the environmental policymaking community turned up virtually no one who could even explain the basic rationale for incentive-based policy measures! Finally, it is probably a fair criticism to say that few of those who did understand the power of incentive–based approaches were willing to make the effort to educate legislators, regulators, and their staffs about this radical alternative.

Economics and the Evolution of Environmental Policy

The story of the growing role of economics in environmental policymaking is a complicated one, only imperfectly understood. Indeed, its chapters contain both serendipitous and more purposeful elements.

One important facet of this story in the United States (but not in Europe) is the emergence of an

alternative incentive-based policy instrument. Economists surely knew that, in principle, it is possible to attain the objective of cutting back waste emissions either by a tax or by a system of tradable emissions permits (TEP). It is straightforward to show that emissions can be reduced to the target level either by setting a sufficiently high tax on emissions or by issuing the requisite number of emissions permits and allowing trading activity to establish the market-clearing price. The outcome in the two cases is, in principle, identical.

But in the early dialogue, discussion focused primarily on the tax approach. My recollection is that most of us in our assessments of the prospects for various policy measures assumed that the so-called quantity approach involving a TEP system would encounter overwhelming opposition inasmuch as it involved literally putting the environment up for sale. Polluters would buy and sell "rights to pollute." There seemed to be little hope for such an audacious proposal.

We were wrong of course, partly, I believe, by reason of historical accident and partly because of a failure to understand the political economy of instrument choice. With the prospect of a tumultuous political confrontation in the mid-1970s over nonattainment of clean air goals in many regions of the country, the U.S. Congress introduced in 1977 a provision for "pollution offsets." Under this provision, new sources of pollution could enter nonattainment areas if existing sources cut back their emissions by more than those of the entrants. Somewhat unwittingly, I suspect, federal legislators had opened the door to what eventually became the Emissions Trading Program, under which trading of emissions allowances for air pollutants has been taking place in many areas.

Tradeable emission permit (TEP) systems turn out to have much more appeal than their tax counterpart in the policy arena. Environmentalists are much more sympathetic to them since, by restricting the number of available permits, the environmental authority can directly and unambiguously achieve its objective. Industry is also receptive. Instead of paying a tax, firms typically receive (under some kind of grandfathering provision) a valuable asset: emissions permits, which they can use either to validate their own emissions or sell for a profit. Regulators much prefer TEP systems to taxes. They can achieve their goal simply by issuing the requisite number of permits; they don't have to worry about setting and then adjusting tax rates to induce the needed reductions in pollution. It is interesting that the TEP approach has not caught on in Europe; there the use of incentive-based instruments has primarily taken the form of taxes on pollution.

The work of environmental economists has, I think, been important in this evolution. Ideas can be a powerful force in the policy arena, and economists were able to provide a compelling conceptual rationale for the new tradable-permit approach. In addition, they carried out a substantial number of careful empirical studies that documented the large cost savings available through the use of incentive-based policy instruments. Over the last thirty years, the educational void has been filled. In response to environmental concerns, courses in environmental economics have sprung up across the country. At the graduate level, the field of "Environmental and Natural Resource Economics" has emerged; Ph.D. students have written dissertations and gone on to teach, carry out research, and take positions in environmental agencies. As mentioned earlier, there now exists a large and energetic organization of environmental economists; the Association of Environmental and Resource Economics has its own journal and holds frequent conferences to help organize research efforts and disseminate the findings. At least as important has been the growing presence of economists in law schools and schools of public policy. Here, many future policymakers have received a firm grounding in the economics of environmental policy.

Resources for the Future has played an important role in this evolution. From the beginning, RFF reached the policymaking community not only through research, but through determined and patient efforts to make available and accessible to the general public not only research findings but, more generally, the basic economic principles of policy analysis and design. Indeed, this very publication, *Resources*, has a long history of doing precisely that (see "Forty Years and a Book").

Lest we go overboard with self-congratulation, however, it is important to recognize that there has been a growing receptivity in the Western world to market-based forms of regulation. The advent of Reaganomics in the United States and Thatcherism in

Britain signaled the arrival of what John Kay has called a new "faith in market forces." Over this period, we have seen a basic change in the intellectual setting for social and economic policy—one that is at least as concerned with "government failure" as with "market failure." From this perspective, the evolution of environmental policy is best seen as part of a larger movement for the fundamental reform of regulatory policies, a movement that actively seeks to employ market incentives for social programs.

Much Left to Accomplish

The role of economics in environmental policy has clearly come a long way over the past thirty years. Prospective environmental programs are routinely subjected to benefit-cost assessments, and at least some attention is often given to the use of incentive-based instruments for the attainment of our prescribed standards for environmental quality. But this progress should not be exaggerated. Most of our regulatory measures, for example, are still of the command-and-control variety. Often it is not easy to design a workable and effective incentive-based mechanism. In fact, the design and implementation of such measures for different kinds of environmental problems are real challenges. An especially fascinating and difficult case is how to design a system of tradable carbon allowances on an international scale to address global climate change. This problem is the subject of widespread interest and current research. Meanwhile plenty of more mundane and localized cases of environmental management need to addressed. We have a long way to go!

While we economists can take some real satisfaction in our contributions to environmental policymaking, we must retain a certain humility. Benefit-cost analyses are a valuable component of program assessment, but we should never base decisions on environmental standards *solely* on the bottom line of a benefit-cost study. Likewise, command-and-control programs will continue to be a fundamental part of our regulatory landscape. But even here there is plenty of room for economic analysis aimed at making such CAC programs more effective in attaining their environmental targets at relatively low cost.

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Forty Years and a Book

Appearing regularly since its first issue in May 1959, *Resources* has offered a variety of provocative articles on research findings, briefings on policy issues, and general overviews of analytical methods. As a teacher, I have found many of these articles so useful that for many years I incorporated them into the reading list for my undergraduate course in environmental economics. But since many of these articles are of broad interest, it seemed desirable to make a collection of them more widely available.

Earlier this year, I edited *The RFF Reader in Environmental and Resource Management*, a compilation containing 43 papers from various issues of *Resources* organized around ten topics. The book is intended to serve both as a teaching resource for classroom use and for the edification of a more general audience. It is fitting that the book also marks the 40th anniversary year of *Resources.* The *RFF Reader* is available in a paper cover from RFF. (To order a copy, see page 16.)