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Report to Congressional Requesters

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ENVIRONMENTAL PROTECTION

Assessing the Impacts of EPA's Regulations Through Retrospective Studies

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Resources, Community, and
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The Honorable Bud Shuster
Chairman
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Frank R. Lautenberg
United States Senate

Over the past three decades, the Environmental Protection Agency (EPA) has issued and enforced regulations, pursuant to federal statutes, to enhance environmental quality. These regulations impose costs, such as compliance expenses for the regulated entities, and produce benefits, such as improved human health and recreational opportunities. These costs and benefits are substantial. In 1997, the Office of Management and Budget (OMB) estimated that federal environmental regulations cost about $144 billion annually and produced benefits of about $162 billion.[1]

Under Executive Order 12866, EPA prepares detailed cost-benefit analyses for all economically significant regulations—including, among others, those expected to have an annual impact on the economy of $100 million or more.[2] These economic assessments inform and improve the regulatory process by prospectively estimating the future costs and benefits of feasible alternatives. Also, under this order, EPA periodically reviews existing regulations that are economically significant to determine if they can be made more effective or less burdensome. The order, however, does not specify the nature or the extent of this review. One tool that can be used in considering such regulatory changes is a retrospective study—an assessment of the actual costs and benefits.

Concerns have been raised, however, that agencies have made only limited attempts to assess the actual impacts of federal regulations. For example, in May 1998, the Senate Committee on Governmental Affairs reported that the review of existing rules, as directed by executive order, "has met with varying degrees of failure. Clearly, getting agencies to review existing rules

[1]In a 1998 report, OMB estimated that the costs of federal environmental regulations were between $120 billion and $170 billion and the benefits could be as high as $3.3 trillion annually. The controversy surrounding this estimate is discussed in our report, Regulatory Accounting: Analysis of OMB's Reports on the Costs and Benefits of Federal Regulation (GAO/GGD-99-59, Apr. 20, 1999).

[2]The executive order was issued on September 30, 1993. EPA is also directed by the Unfunded Mandates Reform Act of 1995 to conduct regulatory cost-benefit analyses under certain circumstances.

is much easier said than done."[3] In light of these concerns, you asked us to (1) determine to what extent EPA's regulations have been the subject of retrospective studies, (2) identify in what ways retrospective studies are viewed as useful or difficult to do, and (3) identify ways to foster such studies in the future.

Results in Brief

Assessments of the costs and the benefits of EPA's regulations after they have been issued have rarely been done. Of the 101 economically significant regulations issued by EPA from 1981 through 1998, only five were the subject of retrospective studies.[4] Various sources—including the Congress, EPA, and academia—have provided the impetus for these studies, which were all completed from 1997 through 1999. These studies covered regulations designed to, among other purposes, control acid rain, phase out chlorofluorocarbons, and reduce air pollution through improved vehicle inspection and maintenance.

Authors of retrospective studies, EPA officials, and other experts told us that these studies have been or can be useful but also pose a number of difficulties for researchers. In terms of usefulness, for example, retrospective studies have provided insights into a new, market-based regulatory approach to reduce emissions that cause acid rain. These studies found that the actual costs of reducing emissions were lower than initially estimated. Based on these findings, a legislative proposal to further limit emissions has been introduced. Retrospective studies are viewed as difficult to do because, among other reasons, it is difficult to obtain valid cost data from regulated entities. For example, corporate accounting and financial records do not typically capture the information necessary to determine the incremental costs of complying with federal environmental regulations, and companies have little incentive to isolate and monitor these costs. Also, it is extremely difficult to quantify actual benefits. One reason is that a significant time lag usually exists between the elimination or major reduction of pollutants and any corresponding change in illness rates.

We found that a systematic approach by EPA would foster retrospective studies in the future. While all economically significant regulations, by executive order, are subject to a prospective economic assessment, EPA is

[3]The Congress has considered a legislative proposal that would require agencies to review or "look back" at existing regulations. To see our testimony on this proposal, see Regulatory Reform: Comments on S. 981—The Regulatory Improvement Act of 1997 (GAO/T-GGD/RCED-97-250, Sept. 12, 1997).

[4]According to EPA, another 14 economically significant regulations have been issued in 1999.

not expected to calculate the actual costs and benefits for all of these regulations. Accordingly, EPA officials told us that they have used the agency's limited resources on prospective economic assessments rather than on retrospective studies. Based on discussions with study authors, EPA officials, and other experts, we found that the resource constraints and the difficulties in conducting retrospective studies could be better addressed if EPA were to develop a plan to foster studies of the actual costs and benefits of environmental regulations. We are recommending that EPA develop a plan based on a systematic (1) identification of candidate regulations for study, (2) assessment of the feasibility of conducting retrospective studies of those regulations, and (3) identification of the resources needed.

Few of EPA's Regulations Have Been the Subject of Retrospective Studies

EPA's regulations have rarely been the subject of a retrospective study.[5] According to EPA, the agency issued 101 economically significant regulations from 1981 through 1998,[6] and five of these regulations have been the subject of retrospective studies. In addition, of the more than 2,600 environmental regulations issued during this period that were not economically significant, 23 were the subject of retrospective studies.

As listed below, the retrospective studies we identified ranged from broad studies, such as a report on the impacts of the entire Clean Air Act, to studies of individual regulations, such as the phaseout of chlorofluorocarbons (CFC). All were completed from 1997 through 1999. Most of the studies had prospective cost estimates against which actual costs could be compared. Several also had information on actual benefits.

- Section 812 of the 1990 amendments to the Clean Air Act required EPA to provide information about the economic costs and benefits and the health, welfare, and environmental impacts of the Clean Air Act. EPA issued the Section 812 study in October 1997.[7]
- The 1990 amendments to the Clean Air Act directed an interagency group to report every 4 years, beginning in 1996, on the costs, the benefits, and the effectiveness of the acid rain program. The group, known as the

[5]We considered a study to be a "retrospective" study if, at a minimum, it contained information on the costs of existing regulations and focused on a specific regulation or a set of regulations with common objectives.

[6]We used 1981 as the starting point because EPA began tabulating the number of its regulations at that time.

[7]When counting the number of regulations that were the subject of retrospective studies, we excluded the regulations covered in the Section 812 study because it aggregated the costs for a number of existing regulations and did not identify the incremental costs of specific regulations.

National Acid Precipitation Assessment Program, issued the first retrospective study under this mandate in 1998.[8]

- Other retrospective studies involving EPA's regulations include 23 studies on pesticides and individual studies on the phaseout of CFCs, sulfur dioxide reductions, vehicle inspection and maintenance, and reformulated gasoline. The sulfur dioxide report was the only one of these studies to include information on benefits.

Various sources provided the impetus for the retrospective studies we identified. The Congress mandated the Section 812 and acid rain studies. The latter study was funded under interagency agreements with EPA and with other federal agencies.[9] EPA's Office of Policy signed a research cooperative agreement with Resources for the Future (RFF),[10] [11] which, in turn, initiated the 23 pesticide studies and the vehicle inspection and maintenance study. EPA's Office of Air and Radiation's Acid Rain Division partially funded the sulfur dioxide study through cooperative agreements with the Massachusetts Institute of Technology and RFF. Two retrospective studies were completed without funding from EPA. The CFC phaseout study was conducted by a faculty member of Harvard University and funded by Harvard University, and the reformulated gasoline study was prepared at the researchers' expense.

In addition to the retrospective studies that have been completed, others are underway. EPA's Offices of Policy and Ground Water and Drinking Water have contracted for a retrospective study of EPA's drinking water standards for atrazine and nitrate.[12] EPA expects the study to be completed by September 30, 1999. Also, under a cooperative agreement with EPA, RFF is conducting another series of retrospective studies on pesticide regulations.

[8]Title IV of the Clean Air Act amendments seeks to reduce the adverse effects of acid rain through reductions in annual emissions of sulfur dioxide and nitrogen oxides from utilities burning fossil fuels.

[9]Agencies in the National Acid Precipitation Assessment Program include EPA; the departments of Interior, Energy, and Agriculture; the National Aeronautics and Space Administration; and the National Oceanic and Atmospheric Administration.

[10]Generally, under this type of cooperative agreement, EPA agrees to a research agenda proposed by the recipient and provides funds without specifying how the research should be done. Also, the recipient shares in the cost of the research.

[11]RFF is an independent, nonprofit organization engaged in research and public education on natural resources and environmental issues.

[12]Atrazine is a herbicide and nitrate is an inorganic chemical present in fertilizers and animal wastes. These chemicals can enter drinking water by runoff into surface water and leaching into groundwater.

Retrospective Studies Are Viewed as Useful but Also Difficult to Do

According to the experts we interviewed, while retrospective studies have provided valuable insights they also have been difficult to perform.

Retrospective Studies Are Seen as Useful

Authors of retrospective studies, EPA officials, and other experts we interviewed identified three primary areas where retrospective studies have been or can be useful by providing (1) information for consideration of legislative or regulatory modifications, (2) insights into the need for methodological improvements in prospective economic assessments, and (3) information for EPA's use in implementing the Government Performance and Results Act (the Results Act).

Modifying Legislation or Regulations

Retrospective studies provide information used in considering legislative and regulatory modifications—especially when a new regulatory approach has been taken. Some time after implementation of a regulation, a comparison of post- and pre-issuance estimates of the costs and the benefits provides insights into whether that regulation is working as planned, whether the burden on regulated entities is appropriate, and whether unanticipated consequences are occurring.

For example, title IV of the 1990 amendments to the Clean Air Act authorized EPA to adopt a new regulatory approach to the acid rain problem instead of the traditional "command and control" approach, under which pollution sources are required to install certain pollution control technologies or meet specific performance standards. The new approach provided market-based incentives. It allocated a number of allowances for sulfur dioxide emissions to each utility under the program. Each allowance represents the limited authority of a utility to emit one ton of sulfur dioxide. The Act set an overall goal and capped the number of allowances to ensure an overall reduction in emissions. Each utility may choose to reduce its own emissions or to purchase unused allowances from another utility. Furthermore, a utility may choose to "bank" its allowances for sale at a later date. The allowances trade freely, as stocks do.

Retrospective studies indicate that the actual cost of reducing emissions under title IV has been lower than initially estimated. One reason for the cost overestimation has been the reduced cost of pollution control technologies. Based on these findings and reports that some ecosystems

are not yet recovering from acid rain, a bill (S. 172) was introduced in the U.S. Senate in January 1999 that would, among other things, further limit sulfur dioxide emissions. The retrospective studies also provided information on whether the market-based approach used for addressing acid rain could be applied to other regulatory areas, such as climate change and greenhouse gases.

Improving Methodologies of Prospective Analyses

Retrospective studies can also provide agencies with insights on how to better conduct prospective cost-benefit analyses and prevent methodological biases in these analyses. For example, some analysts have suggested that EPA tends to overestimate costs because, among other reasons, it does not anticipate and account for cost-saving technological innovations. However, in its analysis of the accuracy of prospective cost-benefit estimates, RFF found that two studies (on reformulated gasoline and the Dinoseb pesticide) had overestimated costs; two (on the CFC phaseout and sulfur dioxide) had accurately estimated costs; and one (on the Aldicarb pesticide) had underestimated costs.[13] Additional retrospective studies would enable EPA to more fully explore concerns about what methodological factors, if any, contribute to the over- or underestimation of costs.

According to an EPA official, even the best models for predicting the costs and the benefits could be based on erroneous assumptions because it is difficult to forecast technological improvements and economic changes. The official explained that one conclusion from the retrospective studies' results might be to include a "technology improvement case" when estimating the costs of regulations.

Providing Information for Implementing the Results Act

Retrospective studies of the costs and the benefits can also help EPA in its efforts to implement the Results Act. The Results Act requires agencies to set goals for program performance and to measure results. Retrospective studies are one means of measuring results. Such analyses aim to identify relevant results—usually expressed in monetary terms—of existing regulations. The studies that identify actual benefits can provide insights into the outcomes of EPA's regulations. We reported in 1998 that the Results Act recognizes and encourages the linkage between program evaluations—retrospective studies are one type of such evaluations—and performance measures. The Act directs federal agencies to provide a

[13]RFF labeled a prospective study as "accurate" if the estimated costs in the retrospective study were no more than 25 percent higher or no less than 25 percent lower than the prospective estimates.

summary of program evaluation findings along with performance measurement results in the required annual performance reports.[14]

Retrospective Studies Are Difficult to Do

Researchers face a number of difficulties in conducting retrospective studies: (1) determining the baseline against which the changes can be identified and measured, (2) isolating the reasons for the actions taken, (3) obtaining valid cost data from the regulated entities, and (4) quantifying the benefits.

Determining the Baseline

According to OMB's 1998 Report to the Congress on the Costs and Benefits of Federal Regulations, one of the primary problems with estimating the incremental costs and benefits associated with implementing a federal regulation is determining the baseline against which the costs and the benefits should be compared. A baseline—how things would have been if the regulation had not been issued—is elusive because so many changes could have occurred while the regulation was being implemented. As OMB's report states, "what would have happened in the absence of regulation can only be an educated guess since it never happened."

In a 1996 report on companies' regulatory burden, we found that it can be extremely difficult for company officials to determine what actions their company would have taken in the absence of the identified regulations.[15] EPA and RFF officials took a more optimistic view but contended that modeling would be needed to establish a baseline. Such modeling can be costly and time-consuming and requires making assumptions about economic behavior that may or may not approximate reality.

Determining the Reasons for Regulated Entities' Actions

According to OMB's report, it is often difficult to attribute the actions taken by regulated entities to specific federal regulations or other external factors. These entities may be responding, for example, to regulations from state and local governments. Voluntary standards from organizations and public pressure also cause firms to protect the public in the absence of federal regulations. In our 1997 report on the governmentwide implementation of the Results Act, we found that regulatory agencies have had difficulty in sorting out the effects of external forces.[16] One expert

[14]Program Evaluation: Agencies Challenged by New Demand for Information on Program Results (GAO/GGD-98-53, Apr. 24, 1998).

[15]Regulatory Burden: Measurement Challenges and Concerns Raised by Selected Companies (GAO/GGD-97-2, Nov. 18, 1996).

[16]The Government Performance and Results Act: 1997 Governmentwide Implementation Will Be Uneven (GAO/GGD-97-109, June 2, 1997). Also, see Managing for Results: Regulatory Agencies Identified Significant Barriers to Focusing on Results (GAO/GGD-97-83, June 24, 1997).

commented that external factors often influence technological innovation and that isolating the impacts of regulations from these other factors is difficult.

In 1997, EPA's Office of Water found these multiple factors to be a problem when it attempted to conduct a retrospective study of effluent guidelines. The Office never implemented the study because it was too difficult to isolate the costs specifically related to compliance with effluent guidelines from either self-initiated technological improvements or state and local government requirements.

Obtaining Valid Cost Data From Regulated Entities

A number of studies have reported difficulties in obtaining valid cost data. For example, our 1996 study on regulatory burden also found that companies' accounting and financial records did not capture the information necessary to determine incremental compliance costs and that there was little incentive to isolate and monitor these costs because such information had little business value. Furthermore, companies were concerned about the disclosure of information that is proprietary (e.g., information on their operating expenses) or could potentially involve regulatory enforcement actions. Similarly, in 1996, we found it difficult to determine the effects of regulatory compliance on research grantees at the National Institutes of Health.[17] Although members of the research community were confident that compliance costs were high, they were unable to provide cost data directly attributable to compliance activities.

Other research organizations have also had difficulties in data collection. According to an expert in cost-benefit analysis at the Massachusetts Institute of Technology, the university conducted a telephone survey to collect actual cost data on scrubber technology, but despite having "very good" industry connections, the survey's results were somewhat disappointing because some companies declined to participate. The Organization for Economic Cooperation and Development—an international agency sponsored by industrialized countries—is conducting a business survey to determine the costs associated with implementing regulations in three general areas: environmental compliance, tax administration, and employment. Its survey is limited to small- and medium-sized businesses. According to Organization officials, it is more difficult for large companies that operate at multiple locations to determine the cost impacts of regulations on their far-flung enterprises and to isolate these costs from the costs attributable to other business decisions. They also told us that asking businesses to self-report capital

[17] Regulatory Compliance for NIH Grantees (GAO/HEHS-96-90R, Mar. 25, 1996).

costs would not be valid because the data would not be verifiable or consistent. In their view, such data would have to be collected through very detailed structured interviews at selected businesses.

Some data on the costs of environmental regulatory compliance were once available. Until 1994, the Department of Commerce administered the Pollution Abatement and Control Expenditures (PACE) survey. When it discontinued the survey to focus its resources on higher priorities, Commerce collected data annually from manufacturers on the aggregate cost of implementing pollution control regulations. Commerce, in collaboration with EPA, is working to resume the PACE survey in 2000. According to EPA, reinstatement of this survey is dependent on the availability of funds. While one expert we interviewed suggested restarting the PACE survey, another raised questions about the data's validity and usefulness. An official in EPA's Office of Policy told us that his agency is aware of these questions and, in developing the new survey, will attempt to address them. EPA also pointed out that the agency's Science Advisory Board and others have recommended reinstatement of the survey.

Another attempt at data collection is currently being undertaken. A contractor is collecting cost data for the retrospective study of the drinking water standards for atrazine and nitrate. EPA officials told us that they believe the drinking water treatment facilities will be able to isolate the costs of compliance for these chemicals. They also expected both public and private treatment facilities to cooperate.

Quantifying Benefits

The experts we interviewed agreed that quantifying the benefits, as part of a retrospective study, is extremely difficult. One cited reason is that data on benefits, which generally accrue outside the regulated entities (e.g., to protected species or society at large), are not available. Another reason, which was highlighted by the author of the CFC retrospective study, is the difficulty in assigning the benefits to a particular regulatory action versus other factors. For example, he pointed out that although the benefits from a reduction in occurrences in skin cancer could be attributed to the phaseout of CFCs, other factors could have played a role. Finally, considerable time may elapse—sometimes decades—before many benefits are realized. For example, some diseases, such as cancer, can have latency periods of decades. We emphasized this difficulty in our 1997 report on the Results Act, citing EPA officials who noted that a significant time lag usually exists between the elimination of a chemical hazard and any corresponding change in illness rates. This lag makes it difficult to track the yearly progress of some of the agency's regulatory actions. EPA's 1997

Strategic Plan noted how difficult it is to assess the risks from pollutants; measure the consequences of pollution to persons, plants, and animals; and assign a dollar value to the health and environmental effects that are remote in distance and time.

A Systematic Approach Would Foster Retrospective Studies

Based on discussions with study authors, EPA officials, and other experts, we found that a systematic approach by EPA would foster retrospective studies in the future. The agency, however, has not targeted regulations for review after systematically (1) identifying candidate regulations for study based on selection criteria, (2) assessing the feasibility of conducting retrospective studies of those regulations, and (3) identifying the resources needed.

Identifying Candidates for Review

While all economically significant regulations are subject, by executive order, to a prospective economic assessment of their costs and benefits before issuance, EPA is not required to calculate the actual costs and benefits retrospectively for all of its rules. Program offices within the agency have, on an ad hoc basis, initiated the sulfur dioxide study and the ongoing study of the drinking water standards. EPA has not, however, reviewed the full array of environmental regulations and, based on criteria, selected certain rules as candidates for study.

In identifying candidates for review, one criterion cited by the experts we interviewed is the potential for learning something useful that would improve the efficiency and the effectiveness of a significant regulatory program. For example, the significance of acid rain for the northeastern states and the concern that existing regulations were not adequately controlling the problem played a role when the Congress mandated a retrospective study. Other criteria cited are the potential for gaining insights into a new regulatory approach to environmental protection or the methodology for prospective economic assessments. A retrospective study can, for instance, examine assumptions made in prospective assessments where uncertainty about regulatory costs exists because a new pollution control technology is being used.

When identifying candidate regulations, timing is another consideration. EPA would examine whether it would be more useful to study the actual costs and benefits of certain regulations shortly after implementation or to wait until a number of years or even decades have elapsed. A major factor

in the timing decision would be the value of gaining insights into a regulation's impacts immediately or after a more extended period of time.

Assessing the Feasibility of a Retrospective Study

The next action would be an assessment of the feasibility of conducting a retrospective study of the candidate regulations. This assessment would focus on the potential difficulties facing a researcher. For example, to obtain valid cost data, EPA might find it easier to address those regulations that rely on market forces because price and cost information is in the public domain rather than those regulations based on "command and control," for which collecting the original data is especially challenging. In some command-and-control cases, however, the regulated entities could take steps during the implementation of the regulation to help researchers develop data on compliance costs. These steps could include asking a sample of regulated entities to establish financial and accounting mechanisms to measure the impact of the regulation as it is implemented. In addition, to attribute changes in the actions of regulated entities to specific EPA regulations, RFF officials suggested that researchers employ the same models used in conducting prospective economic assessments and, therefore, make the same assumptions about regulated entities' taking actions in response to the regulations. Of course, the researchers would attempt to re-estimate the costs and the benefits after updating the model, for example, with any data on the actual steps taken by regulated entities.

Identifying Needed Resources

A planned approach would identify the resources needed to support the retrospective study. Funding is, of course, critical. EPA receives funding for analytical work in general. While EPA has occasionally funded retrospective studies, EPA program officials noted that they have used their analytical resources almost entirely for prospective analyses—those that provide information for decisions on proposed regulations. A 1997 Congressional Budget Office study found that EPA incurred an average cost of $662,000 and a median cost of $376,000 (in 1995 dollars) on 65 economic assessments.[18] The program officials told us that they had limited discretionary funds and resources and needed to use them in developing new regulations. One official said that once a regulation is issued, his office gears up to develop any other regulations required by law.

[18]Regulatory Impact Analyses: Costs at Selected Agencies and Implications for the Legislative Process (Mar. 1997). Costs included time spent by EPA personnel. The majority of the economic assessments in the study were completed between 1990 and 1996. Because the scope and the complexity varied substantially, the costs ranged from as low as $48,000 to as high as $6 million.

The funding needed to do retrospective studies would be substantial if a large proportion of the 101 economically significant regulations issued since 1981 were the subject of retrospective studies. Where we were able to obtain information on study costs, they varied substantially—from $150,000 for the drinking water standards study, to $433,000 for the acid rain report,[19] to $4 million for the Section 812 study.

The method of funding as well as responsibility for a study can have implications for its credibility. Authors of retrospective studies told us that the credibility of these studies is enhanced when EPA funds an independent analysis. The authors stated that it is better not to have the same EPA offices that were responsible for conducting the prospective cost-benefit analysis also responsible for conducting the retrospective study. OMB officials stated that the best estimates of the costs and the benefits of regulation are likely to be retrospective studies done by individuals who do not have vested interests but do have reputations as objective analysts to uphold. One study author believed that the cooperative agreement arrangement helped ensure that the researcher had freedom to maintain independence. As discussed earlier, EPA has used cooperative agreements with organizations, such as RFF and the Massachusetts Institute of Technology. Another author suggested that if EPA's program offices were directly involved in the study, the agency could use some type of advisory committee or peer review process to oversee the studies and ensure their credibility.

Resources also take the form of technical assistance, and EPA has provided some. For example, the Office of Policy has built a library of EPA's economic assessments of major regulations and related reports and provides a limited number of them on the Internet. Furthermore, EPA is now soliciting comments on a major revision of its Guidelines for Performing Economic Assessments.[20] The agency first issued these guidelines in December 1983 and has made a few modifications to them over the past 15 years. The draft revision provides, among other things, a summary of analytical methodologies, empirical techniques, and data sources that can assist analysts in performing economic assessments of environmental policies. While the guidance is targeted more to prospective analyses, its principles can also be applied to retrospective studies.

[19]From 1991 through 1996, the federal government spent $140 million to underwrite the scientific research contained in the acid rain report. This research included an extensive network of monitoring stations that provided scientists with data sets.

[20]The Environmental Economics Advisory Committee of EPA's Science Advisory Board has a major role in reviewing these guidelines.

To foster retrospective studies, the experts we interviewed also suggested that the availability and the accessibility of the prospective economic assessments and supporting documentation would have to be improved. For example, some of these authors who had used the models employed in the prospective analyses told us they had difficulty with the availability and the usefulness of the models. One researcher wanted to run the model used for the prospective economic assessment with different inputs. This would have served as a useful way to determine to what extent and why the estimate of actual costs and benefits differed from the prospective estimate. In conducting his study, he had difficulty obtaining the complete model from EPA. He was, however, able to obtain the complete model from the contractor who performed the assessment. Another author found that although he had access to the original model and supporting documentation, it was very difficult to extract information. Acknowledging concerns about the accessibility of models, the Office of Air and Radiation maintains a web site that has placed all model inputs in the public domain.

Finally, one author focused on the importance of capturing data on the incremental costs of regulatory compliance from the regulated entities. He noted that EPA would enhance its and others' capacity to evaluate environmental regulatory programs if the agency collected and maintained data on the costs immediately after issuing those regulations it has targeted for retrospective study.

Conclusion

EPA's regulations, issued pursuant to federal statutes, cause this nation to make a substantial investment in protecting the environment. They also result in considerable benefits. While EPA devotes substantial resources to cost-benefit analyses when developing new regulations, the agency seldom looks back at the actual costs and benefits after those regulations have been implemented. An executive order and "good government" principles recommend that EPA periodically reassess selected regulations to determine if they are still needed and, if so, whether and how they could be improved. Retrospective studies are difficult to do, but they are a potentially valuable tool for such reassessments. We believe that EPA's current ad hoc approach gives no assurance that economically significant regulations will be subjected to review. A systematic, planned approach would help EPA to foster retrospective studies in the future.

Recommendation

To help determine if existing environmental regulations need to be retained or improved, we recommend that the Administrator, EPA, establish a plan to study the actual costs and benefits of such regulations, including when and how to use retrospective studies as an integral part of its approach. The plan should target selected regulations for review based on a systematic identification of candidate regulations, an assessment of the feasibility of studying those regulations retrospectively, and an identification of the resources needed.

Agency Comments

We provided a draft of this report to EPA for its review and comment. EPA commented that the report is accurate, provides a fair characterization of the difficulties in performing retrospective studies, and offers some useful suggestions on how the agency could approach such studies in a more systematic manner.

EPA also suggested that the budget implications of conducting retrospective studies need to be emphasized in the report because the scarcity of budget and internal resources limits the number of such studies that the agency could support without the Congress' providing significant additional resources. In this report, we recognize that EPA concentrates its analytical resources on prospective economic assessments, which EPA is expected to perform, rather than on retrospective studies. Executive Order 12866 states that EPA's review of existing regulations should be consistent with the agency's resources and regulatory priorities. We believe that if EPA were to develop a plan, as we are recommending, the agency would be better able to identify the additional resources needed to retrospectively review selected regulations. EPA also provided specific technical comments and clarifications, which we incorporated, as appropriate. EPA's comments are contained in appendix I.

Scope and Methodology

To accomplish our objectives, we interviewed officials in EPA's Office of Policy; Office of Air and Radiation; Office of Water; Office of Solid Waste and Emergency Response; Office of Prevention, Pesticides, and Toxic Substances; and Office of the Chief Financial Officer and obtained and reviewed related legislation, memorandums, and reports. We also interviewed all of the authors of the retrospective studies identified in this report and several other experts in cost-benefit analysis, including RFF and OMB officials, and representatives from Harvard University, the Massachusetts Institute of Technology, and the Organization for Economic Cooperation and Development. In documenting the difficulties in

obtaining actual cost data from companies, we relied heavily on our November 1996 report, Regulatory Burden: Measurement Challenges and Concerns Raised by Selected Companies. To identify the universe of retrospective studies, we used data developed by RFF for its January 1999 report, On the Accuracy of Regulatory Cost Estimates. We also added the Section 812 report, the acid rain report, and pesticide studies that RFF chose to exclude because they met our criteria for containing information on the actual costs of existing regulations and focusing on a specific regulation or a set of regulations with common objectives.

We conducted our review from October 1998 through September 1999 in accordance with generally accepted government auditing standards.

We are sending copies of this report to Senator Fred Thompson and Senator Joseph Lieberman, as Chairman and Ranking Member, respectively, of the Senate Committee on Governmental Affairs; Representative Dan Burton and Representative Henry Waxman, as Chairman and Ranking Member, respectively, of the House Committee on Government Reform; Representative James Oberstar as Ranking Member of the House Committee on Transportation and Infrastructure; the Honorable Carol Browner, Administrator, EPA; and the Honorable Jacob Lew, Director of OMB. We will also make copies available to others on request.

If you have any questions about this report, please contact me on (202) 512-6111. Major contributors to this report were Jay Cherlow, Ellen Crocker, Bob Levin, and Bruce Skud.

Peter F. Guerrero
Director, Environmental Protection Issues

Comments From the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 19 1999

OFFICE OF
POLICY, PLANNING AND EVALUATION

Mr. Peter F. Guerrero
Director, Environmental Protection Issues
United States General Accounting Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Guerrero:

Thank you for the opportunity to review the GAO Draft Report "Gaining a Better Understanding of the Impacts of EPA's Regulations" (GAO/RCED-99-250). In general, the report is accurate and well written. Overall, the report provides a fair characterization of the difficulties in producing retrospective studies, and offers some useful suggestions on how EPA could approach the conduct of these types of studies in a more systematic manner.

Our review has raised a couple of key issues that we would like to briefly address. Additionally, we have a few minor corrections and clarifications that we will append.

Resource Constraints: The primary recommendation of the report is that EPA should establish a process for identifying appropriate rules for study and conducting retrospective economic analyses on a regular basis. While we may learn useful lessons from such studies, the scarcity of budget and internal resources limits the number of such studies that the Agency could support unless Congress provided significant additional resources for this purpose. The budget implications of conducting retrospective studies needs to be emphasized in the report.

PACE Survey: The information provided on the effort to restart the PACE survey (page 9) is incomplete. The fourth sentence in the paragraph at the bottom of page nine should read: "Commerce, in collaboration with EPA, is working to resume the PACE survey in the year 2000. However, reinstituting the survey is contingent on EPA providing funding for the survey, or on Congress providing additional resources for the survey to be carried out." It would be useful to also point out that the PACE survey provides the only source of national industry-level pollution abatement cost data. EPA has recently received written recommendations from EPA's Science Advisory Board, major representatives of the business community, and from international organizations, to continue collection of national environmental expenditure data.

Revision of these points would enhance the report. We would be happy to further discuss these issues with you if you require additional information or clarification.

Thank you again for the opportunity to review the report.

Sincerely,

Al McGartland
Director, Office of Economy and Environment

Additional corrections and comments:

p.2 The GAO report refers to "100 economically significant regulations issued since 1982". EPA staff provided an estimate of 115 economically significant rules issued since 1981. Given this information, it is unclear why GAO has chosen to use a figure of 100. See also text on pages 3 and 12 and reference in footnote # 5. EPA provided data for the period 1981 to 1999. The footnote states "We used 1982 as the starting point for tabulating the number of regulations because EPA did not have data available beyond that year." EPA provided data back to 1981, which was the earliest date that could be references since the Executive Order 12291 did not take effect until 1981. A more accurate statement would discuss how the number represents those regulations issued since the effective date of the Executive Order. As written, the reader might infer EPA is unable to respond to the GAO request for information, which is erroneous.

p 4. The description of a cooperative agreement in footnote #9 could be improved. A cooperative agreement is a specific type of assistance agreement, in which the recipient (RFF) and the funding agency (EPA) engage in some level of cooperation and joint involvement in the conduct of research. In general, for cooperative agreements a Federal funding agency (EPA) agrees to finance a research agenda specified by the recipient (RFF). The agenda describes the nature of the research questions (i.e., the "what"), but leaves the recipient some latitude (i.e., the "how") in the selection of methods used to investigate these questions. A cooperative agreement also allows for more substantive involvement by the Federal funding agency in the conduct of research than is the case with a grant. The level of involvement varies with each cooperative agreement. The cooperative agreements cited in the GAO report probably had very limited involvement by EPA staff in the actual conduct of research. Finally, under recently revised administrative laws, the recipient is not required to share in the costs of the research, though they may choose to do so. But several past EPA cooperative agreements cited in the GAO report did have required cost sharing arrangements.

p. 13 The reference to a "$2 million (cost) for the Section 812 study" needs to make clear that this estimate only covered the costs to EPA of preparing its retrospective study. A prospective study is now in draft form, which is also required under Section 812 of the Clean Air Act Amendments of 1990. Since the GAO report focuses on retrospective studies, this may be a fairly obvious point. But it may be useful to make this distinction in light of the anticipated release of the prospective Section 812 study this coming November.

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