The history of the new mercury rule offers important insights into improving environmental policymaking.

The Political Economy of Mercury Regulation

By Ted Gayer, *Georgetown University*

and Robert Hahn, *American Enterprise Institute-Brookings Joint Center for Regulatory Studies*

IN ITS WANING DAYS AFTER THE 2000 ELECTION, the Clinton administration decided to initiate an expensive plan to regulate mercury emissions from power plants. The decision culminated a lengthy process that began with the 1990 Clean Air Act Amendments, which required the Environmental Protection Agency to evaluate mercury and other toxic emissions to determine if they warranted more stringent regulation.

The Clinton administration had earlier dragged its feet on completing that analysis. But after environmental groups filed suit over the inactivity, the administration agreed to make a determination on mercury regulation by December 15, 2000. In a settlement agreement, the administration stipulated that if mercury were to be regulated, a final rule would be issued by December 2004—a date that was later extended to March 2005.

This created a difficult situation for the incoming Bush administration. While there are thought to be some identifiable economic benefits from regulating mercury emissions, such as an increase in IQ levels in children, it is not clear that the benefits of regulation justify the cost. But even if the expected benefits fall far short of the expected costs, the Bush White House was under political pressure to formulate a concrete proposal for regulating emissions. Any decision to move away from regulating mercury would have to reverse the Clinton administration's determination that such regulations are "appropriate and necessary."

The 15-year saga that concluded with the Bush administration's mercury rule offers insights into the politics and economics of environmental regulation. The mercury saga also illustrates several policy lessons for future regulation.

Ted Gayer is an associate professor of public policy at Georgetown University and a visiting scholar at the American Enterprise Institute.

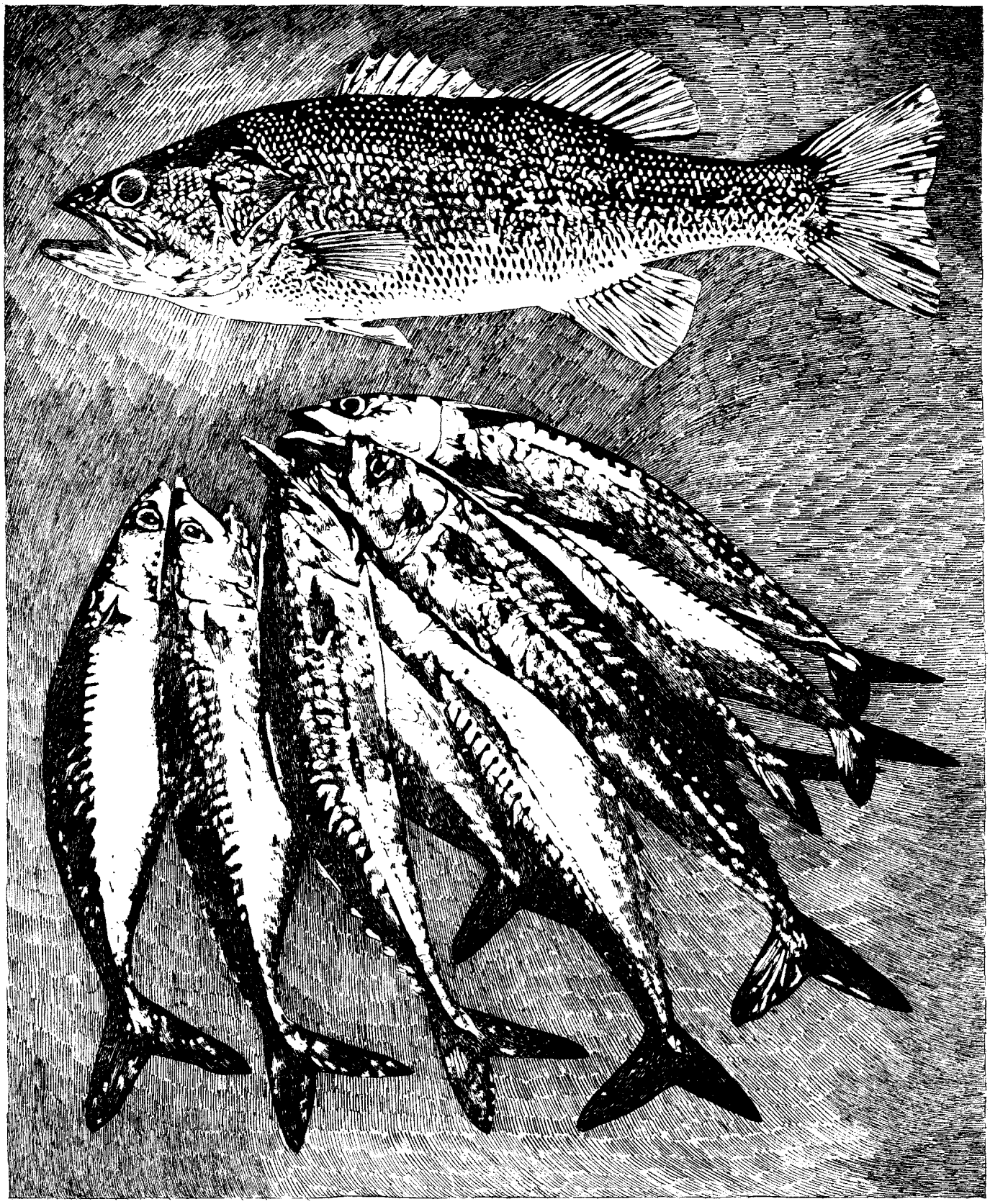
Robert Hahn is cofounder and executive director of the AEI-Brookings Joint Center for Regulatory Studies and a resident scholar at AEI.

LAW AND ECONOMICS 101

In 1990, President George H. W. Bush signed into law several far-reaching amendments to the federal Clean Air Act. The president had said he wanted a new law and he got one. And even though the environmentalists gave him little credit for the legislation, it likely would not have moved forward without his support.

The new amendments had some desirable and undesirable features from an economist's perspective. On the plus side, the legislation mandated that reductions in sulfur dioxide emissions were to be accomplished using a market-based approach that features emissions trading. The basic idea, suggested over four decades ago, is to put a cap on the overall level of emissions that were allowed, but to permit firms to trade emission rights in order to achieve the goal in the least costly manner. Although the legislation explicitly states that the allowances to pollute are not property rights, a key reason the trading program reduces costs is that the market treats the allowances as such.

The trading program was the major piece of good economic news in the act. The legislation, however, contained a



MORGAN BALLARD

number of undesirable economic features. It did not have a requirement, for example, that benefits exceed costs when developing regulations—indeed, in setting overall air quality standards, the EPA is forbidden from even considering costs. The legislation also contained a number of mandates in which the benefits of regulation were not likely to exceed the costs. One example is the regulation of ozone, which contributes to smog. A second example is the new provision to regulate toxic air emissions like mercury. The act requires the EPA to determine whether it is "appropriate and necessary" to regulate toxic air emissions from utilities using conventional command-and-control regulations.

METHYLMERCURY As any chemistry student should know, mercury is nasty stuff. You do not want to break an old glass thermometer and let the mercury bead up on the floor for some child to touch. But the mercury coming from smokestacks is different because humans are likely to be exposed to much smaller concentrations. Indeed, mercury coming from smokestacks poses a risk only after it is converted by bacteria into methylmercury and then accumulates in fish tissue as it moves up the food chain. (For more discussion of this issue, see "Methylmercury Madness," p. 7.)

The act established a timeline for the EPA to decide whether and how to regulate mercury emissions from coal-burning electric utilities. After delaying this determination, the Clinton administration was sued and ultimately agreed to make the determination by December 15, 2000. That meant the decision would not come until after the 2000 election, which resulted in George W. Bush's defeat of Bill Clinton's vice president, Al Gore. At that date, the Clinton White House decided that it was "appropriate and necessary" to regulate mercury under the section of the act that requires costly command-and-control regulations.

Faced with this determination and with a December 2003 deadline to formulate a specific regulation, the Bush administration decided to propose two regulatory options. One was to offer the command-and-control option designated by the act, which would require Maximum Available Control Technology (MACT). The second proposal was a "cap-and-trade" approach that involved putting a cap on mercury emissions and then allowing trading. Because the cap-and-trade approach falls under a different section of the act, the Bush administration proposed reversing the Clinton administration's determination that it is "appropriate and necessary" to use MACT to regulate mercury.

COSTS AND BENEFITS In the Bush EPA's preliminary proposal, there was no serious analysis of the costs and benefits of either option. We conducted that analysis ourselves, and the results are summarized in Table 1. The costs and benefits assume that, without the mercury regulation, sulfur dioxide and nitrogen oxides emissions from power plants would still be subject to another rule offered by the Bush administration. We use this as our baseline because, when the EPA first proposed the cap-and-trade approach to mercury regulation, it stated that it "dovetails well" with the cap-and-trade rule on sulfur dioxide and nitrogen oxides. Both rules were proposed at the same time, and the sulfur dioxide and nitrogen oxides rule was finalized just before the release of the mercury rule.

Table 1 reveals two interesting points. First, the command-and-control option appears to be very expensive relative to the cap-and-trade option. In present-value terms, it is about $15 billion more expensive (in 2004 dollars), depending on which discount rate is selected. Second, the benefits from reducing mercury emissions from power plants are about an order of magnitude less than the costs of the cap-and-trade program. Benefits are about $100 million and the costs of the cap-and-trade program are about $4 billion.

Our benefit numbers are based on a series of calculations that link emissions from power plants to changes in IQ. The linkage involves several steps. First, emissions from U.S. power plants need to be linked to deposition. Second, deposition needs to be linked to mercury concentrations in fish. Third, mercury concentrations in fish need to be linked to fish consumption by U.S. residents. Fourth, consumption of fish by U.S. residents needs to be linked to mercury concentrations in humans. Finally, mercury concentrations in humans need to be linked to changes in outcome variables, such as IQ. In our view, existing studies are not terribly conclusive on the linkage between IQ and mercury in blood. We cannot rule out the possibility that there is no linkage at typical doses, but we assume that there is one, following the National Research Council. More generally, there are substantial uncertainties in all of the steps in the estimation. We tried to consider those uncertainties using sensitivity analyses.

Our strategy for estimating benefits was to use either an estimate of the central tendency or the upper bound for uncertain assumptions. We expect, as a result, that our benefit estimate is biased upward. We did a sensitivity analysis of our results and found that in no cases did the quantifiable benefits exceed the quantifiable costs. Of course, it is possible that we left out something important. Some have claimed, for example, that there is a connection between blood mercury levels and heart disease. We did not include that and other alleged benefits because we did not think the current state of science justifies it. One study suggests those benefits could be substantial, but notes that the linkage has not been established at a reasonable level of certainty. In its final mercury rule, the EPA also concluded that those effects were not clearly established and warranted additional research before incorporating in a regulatory analysis.

TABLE 1

Value of Benefits, Costs, and Net Benefits

From Proposed Clean Air Mercury Rules (in billions of 2004 dollars)

Discount Rate	MACT			Cap and Trade		
	Benefits	Cost	Net Benefits	Benefits	Cost	Net Benefits
3%	$0.082-$0.14	$21	($21)	$0.086-$0.15	$5.5	($5.4)-($5.3)
5%	$0.070-$0.12	$18	($18)–($17)	$0.068-$0.12	$4.3	($4.3)-($4.2)
7%	$0.063-$0.11	$15	($15)	$0.058-$0.10	$3.4	($3.4)–($3.3)

Notes: Numbers are rounded to two significant digits. Cost estimates computed by Charles River Associates. Parentheses indicate negative values. Net benefits equal benefits minus costs. For details of benefit calculations, see "Designing Environmental Policy: Lessons from the Regulation of Mercury Emissions," by Ted Gayer and Robert W. Hahn. AEI-Brookings Joint Center for Regulatory Studies, *Regulatory Analysis* 05-01 (revised March 2005).

FINAL RULE After we completed our analysis, the Bush EPA came out with its final rule. The rule basically adopted the cap-and-trade proposal that was included

in the proposed rule, but with a few important changes. First, it reduced the level of reductions required in the first phase of the program, allowing 38 tons per year rather than 34 tons. Second, it got rid of the provision known as the safety valve, which set a ceiling price of $2,187 per mercury allowance. With the safety valve, power plants are given the option of purchasing additional allowances above the cap from the federal government. This safety valve was meant to hedge against any unexpected increases in the price of mercury reductions. It was designed to sustain long-term environmental protection by reducing future allowances by an amount equal to the number of allowances sold by the federal government.

The EPA did a benefit-cost analysis of its final Clean Air Mercury Rule, the results of which are summarized in Table 2. The agency presents annual estimates of both costs and benefits in the year 2020. The results are not directly comparable with Table 1 because we provide present value estimates of benefits and costs for 2005 through 2020. For the year 2020, our costs are very similar to the EPA's, but our benefits are about one order of magnitude higher than theirs. The reason our benefit estimates are higher is that we assume, conservatively, that benefits result as soon as mercury emissions are reduced and that mercury emissions reductions will reduce mercury concentrations in all fish caught in U. S. oceans and lakes. The EPA assumes a lag time of five to 50 years before benefits occur and assumes that emissions reductions will only significantly affect human mercury exposure in the United States from the consumption of freshwater, recreationally caught fish. Still, the bottom line is that the EPA analysis arrives at the same qualitative result—the benefits of the regulation are not likely to justify the costs.

TABLE 2

EPA's Monetized Annual Benefits

Benefits, Costs, and Net Benefits of Final Clean Air Mercury Rule in 2020*

Discount Rate	Benefits	Cost	Net Benefits
3%	$1.9-$3.4	$180	($180)
7%	$0.9-$2.3	$1,000	($1,000)

Notes: Numbers are rounded to two significant digits and represent annualized benefits and costs anticipated in 2020. Parentheses indicate negative values. Net benefits equal benefits minus costs.

***In millions of 2004 dollars.**

Source: Environmental Protection Agency

MERCURY POLITICS

Since leaving office, former Clinton EPA administrator Carol Browner has forcefully called for the stringent regulation of mercury emissions from power plants. However, for the eight years that she ran the agency, Browner's EPA did nothing substantive to address mercury emissions from power plants. Only in its final days, after being prodded by a lawsuit, did it issue a decision—and that decision left the actual rulemaking to the incoming Bush administration. One wonders, then, why Browner did not choose to regulate power plant emissions of what she later called "one of the most potent health threats in the environment, posing particular risks to children and developing fetuses." We suspect politics could provide at least a partial explanation for the decision to highlight the mercury issue after leaving office rather than while serving as administrator.

Politics is also a useful prism through which to understand the debate about how many newborns might be at risk. For example, the *New York Times* reported that government scientists suggested that 630,000 babies born each year "might have been exposed as fetuses to unsafe levels of mercury." To understand the alleged basis for that number, you need to understand the concept of a reference dose, which is the basis of the "unsafe" level mentioned above. The EPA established a reference dose of 5.8 parts per billion blood mercury concentration in women of child-bearing age as a measure of exposure that places children at an increased risk of adverse health effects. The National Research Council (NRC) subsequently examined the studies of mercury health effects and supported the EPA's reference dose for mercury.

The reference dose is grounded in a number of conservative assumptions that, taken together, likely overstate the seriousness of the mercury problem. The starting point for deriving the reference dose is to estimate the benchmark dose, which is the lowest maternal blood mercury concentration expected to lead to a five percent increase in adverse health outcomes to children.

Even though one study found no adverse health effects from maternal mercury exposure to fetuses, the NRC focused on another study that did find an effect in order to determine the benchmark dose at 85 parts per billion. For precautionary purposes, the NRC then used the 95 percent lower confidence limit of the benchmark dose to arrive at a benchmark lower dose of 58 parts per billion. The NRC study then applied an additional safety factor by dividing the benchmark lower dose by 10, which leads to the reference dose of 5.8 parts per billion. Thus, the reference dose is much lower than the blood mercury level that has been found to result in significant adverse health outcomes in children.

A study by the Centers for Disease Control found that approximately 7.8 percent of women of child-bearing age sampled in 1999 and 2000 had blood mercury levels above the reference dose. Given approximately four million births in the United States each year, this means that approximately 300,000 newborns are likely to be born from women who have blood mercury levels above the reference dose. Some scientists have claimed that, in fact, approximately 630,000 newborns might be at risk each year. Interestingly, the press picked up this number uncritically in reporting on the issue.

The *Times* statement is misleading in a number of ways. First, it uses the word "might," which is fairly weak, but is attached to the number 630,000, which gives the impression of a serious health problem. A critical flaw is that scientists generally fail to attach any probability to the 300,000 or 630,000 estimates. Sec-

Thought Leadership.
Leadership Readership.
Readership Leadership.

Source: MRI Spring 2002, Spring 2001

For 85 years, through good times and bad, ***Forbes*** has delivered the skeptical and numerate analysis of business that can't be found anywhere else. While other business magazines have changed their style and perspective more often than the fashion magazines, ***Forbes*** has always remained true to its purpose and philosophy.

So it's no coincidence that our readers have been loyal to ***Forbes.*** Our audience is growing, while other business publications are losing readers. ***Forbes*** has more top management readers than any other business publication. And the largest total audience of any business magazine.

For thought leadership, there's only one publication that more leaders read than any other.

Never settle.™

Forbes®
CAPITALIST TOOL®

ond, the reference dose is likely to be very conservative in the sense of overstating what might be reasonably thought of as a safe dose. Finally, the upward adjustment from 300,000 to over 600,000 was based on findings that mercury levels in fetal cord blood are higher than in maternal blood. However, this relationship was already accounted for as part of the uncertainty factor in the original derivation of the reference dose. Interestingly, no one in the mainstream press picked that up.

But the story gets better. Whereas the study by the Centers for Disease Control found that 7.8 percent of women of childbearing age have blood mercury levels above the reference dose, a follow-up sample in 2001 and 2002 found that only 3.9 percent are above the reference dose. If one accepts the reference dose and uses the more recent data by the Centers for Disease Control on blood mercury levels, the claims of 300,000 children at risk should be adjusted downward to less than 200,000. To our knowledge, this factoid never made it into the general debate. Imagine the press reporting that the number of children at risk went down by over 150,000 using more-recent data—another "dog-bites-man" story.

The implication is not that the reference dose is unimportant. Rather, there are three key points: First, the reference dose contains a number of conservative assumptions regarding risk. Second, the numbers bandied about in the mainstream media were simply wrong and probably substantially overstated the risk, but they were taken as gospel. Third, no one in the political debate seems to have cared very much about the core problem that economists tend to focus on—which is whether the economic benefits of the proposed action were likely to justify the costs.

Beyond reference doses and children at risk, there was the normal interest group politics surrounding this debate. Many environmental interest groups backed a proposal that called for a 90 percent reduction in mercury emissions. There is no reliable modeling information on the costs of such a proposal. However, given that the costs of removing mercury are likely to increase more than proportionately with greater reductions, while the benefits increase proportionately, any alternative plan to further reduce mercury would probably impose greater net costs than the ones already proposed.

Industry responded by saying the EPA's proposed rule will have higher costs to society than benefits. They argued that more research should be done before we finalize expensive regulations, citing the uncertainty surrounding the impact of mercury on intelligence and the fact that commercially available technology that would meet the EPA's mercury standards does not exist currently.

BROADER LESSONS

There are a number of lessons that can be drawn from the EPA's proposed regulation of mercury. Here we offer six:

- *When the benefits from a policy intervention are likely to be "small," the probability that the regulation will make matters worse should be carefully considered prior to intervention.* Consider the problem of regulating mercury from power plants. The benefits of regulating such emissions are likely to be small. According to our conservative risk parameter estimates, if mercury emissions from U.S. power plants were completely eliminated, IQ scores could be expected to increase by an average of 0.012 points per newborn. That is an upper bound of benefits because the new regulation of sulfur dioxide and nitrogen oxides from power plants will reduce some mercury emissions independent of the mercury rule, and because the incremental reductions from the mercury rule in any year amount to no more than 37.5 percent of total current emissions. Our calculations suggest that the benefits are not likely to exceed the costs.

  Unfortunately, the case of mercury is not all that unusual. The expected net benefits of many policy interventions are negative, particularly when an issue has achieved some political salience. The bottom line is that not all problems are worth addressing, so we need to separate the important ones from the less important, or even trivial, ones.

- *Problems that are global in scope could require an international regulatory response.* Mercury has many characteristics of a global public bad. Most of the emissions from local sources go into a global reservoir and are not deposited domestically. And a significant fraction of domestic fish consumption contains mercury that is unrelated to domestic activity. This suggests that if mercury were viewed as a problem worth addressing, it is probably best to figure out some kind of global, or at least multinational, response.

  The question is whether an agreement is needed to control emissions of mercury. We have not done a detailed calculation, but we suspect that the benefits are not likely to outweigh the costs of controlling mercury emissions in many developed and developing countries. The reason is that of the 5,000 to 5,500 tons of annual mercury emissions worldwide, the EPA estimates that only about 40 percent come from current anthropogenic sources. Another 40 percent comes from the recycling of mercury already in the environment as a result of past natural emissions and human activities. The remaining 20 percent comes from natural sources. A complete shutdown of all worldwide coal-fired power plants, incinerators, and factories would reduce mercury emissions by less than 40 percent.

- *In general, framing policies too narrowly, as in the case of mercury, runs the risk of suboptimal responses.* The EPA initially claimed that the primary benefits of its proposals to regulate mercury emissions came from reductions in other pollutants that contribute to the formation of fine particles. But if that were the case, then regulators should focus directly on the problem of regulating fine particles and its precursor pollutants rather than trying to control those emissions in a roundabout way. Moreover, the key pollutants that contribute to fine particles are already capped under a different rule, so regulating mercury will not lead to additional reductions.

■ *Policymakers should not assume that the introduction of market-based approaches will necessarily improve economic welfare.* Many economists, including the authors of this article, believe that market-based approaches to pollution control can provide a viable, cost-effective way of achieving environmental goals. At the same time, there is the possibility that the introduction of a market-based approach could reduce economic welfare. The problem arises if, for example, an economically inefficient regulation would not have been implemented were it not for the existence of a market-based approach. While this was likely not the case for mercury regulation, it is a consideration. The deeper problem that needs to be considered in evaluating policy options is identifying the relevant counterfactual for assessing the efficiency gains from a policy.

■ *Care should be taken to use expected values, rather than conservative assumptions, where they are available in setting a safe dose.* In many cases, it may not be possible to define a "safe" dose in the sense of being 100 percent safe for all people. If guesses and estimates need to be made, they should be stated explicitly. By focusing on worst-case scenarios, there is a real danger that society will allocate considerable resources chasing after negligible or nonexistent health risks. Indeed, the use of a reference dose for mercury, based on conservative assumptions, may have the unintended consequence of increasing risk by reducing the amount of healthy fish consumed.

■ *Policymakers should identify the impacts of a regulation in clear economic terms so that interested parties have time to comment before the regulation is finalized.* The EPA was required by Executive Order 12866 to do a cost-benefit analysis when it made its initial regulatory proposals on mercury. That it chose to wait until the final rule to consider issuing a quantitative analysis is bad for the policy process. We understand that the White House, for political reasons, may not have wanted to publicize analyses indicating that the benefits of their proposed policy were likely to fall short of the costs, but that is no reason not to comply with the executive order.

CONCLUSION

This article provided an overview of the costs and benefits of regulating mercury emissions from power plants using IQ gains as a measure of benefits. Our assessment suggests strongly that the benefits are not likely to be worth the costs. This is true both for the command-and-control regulatory regime that was proposed as well as the market-based regulatory regime that was ultimately adopted. However, the market-based approach could reduce the costs of achieving the emissions goal by about $15 billion dollars.

While, on the surface, this appears to be a good outcome, it is uncertain whether that is truly the case. If the market-based approach is what made this regulation politically feasible, it may be imposing net costs on society. If, on the other hand, we would have had a command-and-control regulation like the one the EPA originally proposed, the market-based approach increases net economic welfare. Thus, the baseline for comparison is of paramount importance in assessing welfare effects.

As a society, we are in real danger of focusing on very small risks if they become salient political issues. The regulation of mercury emissions from power plants is one such example. We are likely to spend billions of dollars on reducing mercury emissions from power plants and getting very modest, if any, improvements in IQ scores in return.

In his now-classic book *Breaking the Vicious Circle,* Justice Stephen Breyer explores some of the fundamental problems with environmental, health, and safety regulation and also examines some ways to fix those problems. A similar exercise is undertaken in Philip Howard's best-seller *The Death of Common Sense.* Both authors come to the conclusion that the current regulatory system is broken, observing that we regulate in ways that are suboptimal from an economics point of view. In particular, we often regulate trivial risks.

The question, of course, is how to fix the problem. We do not believe this problem has a global fix that is politically feasible. One of our preferred fixes would involve two steps: First, limit the government's scope for regulation to those areas where a significant market failure can be demonstrated; and second, have a requirement that the policy intervention be likely to do substantially more good than harm. In computing net benefits, it is also important that risk estimates be based on health effects that reflect the state of scientific knowledge.

Based on our proposed fix, it is unlikely that government would have decided to regulate mercury under either of the proposals. Even if a significant market failure could have been demonstrated in this case, it is highly unlikely that the

READINGS

- *Breaking the Vicious Circle: Toward Effective Risk Regulation,* by Stephen Breyer. Cambridge, Mass.: Harvard University Press, 1993.
- "Designing Environmental Policy: Lessons from the Regulation of Mercury Emissions," by Ted Gayer and Robert W. Hahn. AEI-Brookings Joint Center for Regulatory Studies, *Regulatory Analysis* 05-01 (revised March 2005).
- "Economics and the Clean Air Act," by Paul R. Portney. *Journal of Economic Perspectives,* Vol. 4, No. 4 (1990).
- "Economists and Public Policy," by George J. Stigler. *Regulation,* Vol. 6, No. 3 (May/June 1982).
- "The Perils of Prudence: How Conservative Risk Assessments Distort Regulation," by Albert L. Nichols and Richard Zeckhauser. *Regulation,* Vol. 10, No. 6 (November/December 1986).
- "What Can We Learn from the Grand Policy Experiment? Lessons from SO^2 Allowance Trading," by Robert N. Stavins. *Journal of Economic Perspectives,* Vol. 12 (Summer 1998).

proposed policy interventions could be shown to do more good than harm.

To the extent there was a failure here, it was a failure of a different kind. The regulation of mercury appears to be a case in which the strategic use of the courts helped yield outcomes that are economically inefficient. Several scholars have noted how courts frequently yield regulatory results that are far from efficient, particularly in the field of environmental regulation.

Of course, the final regulation also is a direct result of the 1990 Clean Air Act Amendments, which call for regulation of toxic air emissions with little regard to balancing benefits and costs in most situations. Given the highly prescriptive language contained in parts of the act, it will be interesting to see if the market-based approach contained in the Bush administration's final rule withstands court challenges.

The final mercury rule, like many regulations, represents a political compromise. The Clinton administration, recognizing that its days were numbered, made it virtually impossible not to do something on regulating mercury from power plants. The Bush administration's actions can reasonably be interpreted as making the best of a bad political and economic situation.

There is one significant silver lining in the Bush rule. If the cap-and-trade system goes ahead as planned, it will show that it is possible to design an emission trading system that works for a so-called "toxic" air pollutant. Up until this point, the environmental community had been fairly successful in arguing that such toxics should not be traded. If the mercury trading system is successful in environmental and economic terms, it may help pave the way for the trading of other air toxics where trading can be justified.

Furthermore, the current Bush administration, by promoting market-based approaches for controlling particulates and mercury, has cemented the environmental legacy of the first President Bush. That president's crowning environmental achievement was to help introduce the market-based approach for addressing acid rain. In the future, politicians of all stripes will find it easier to embrace such market-based approaches where they may be sensible either for political and/or economic reasons.

We conclude with one final observation that George Stigler made in this journal more than two decades ago. He noted that citizens may not want a government or regulatory apparatus that focuses on making the most economically efficient use of society's limited resources. (See "Economists and Public Policy," May/June 1982.) We think Stigler was correct then and is still correct today.

Nonetheless, when resource misallocations are substantial, we think it behooves our elected officials, as well as our fellow voters, to understand the implications of their decisions. Spending several billion dollars to reduce emissions that are likely to yield few social benefits means that we have several billion dollars less to spend on things that could do a lot more good. R

CriticalReview

EDITOR
Jeffrey Friedman
Barnard College, Columbia University

BOARD OF ADVISORS *(partial list)*
David Beito, Peter Boettke, James Buchanan, Bruce Caldwell, Ronald Coase, Tyler Cowen, Richard Epstein, Roger Garrison, Steven Horwitz, Israel Kirzner, Seymour Martin Lipset, Stephen Macedo, Jerry Muller, Douglass North, Richard Posner, Earl Ravenal, Mario Rizzo, Chris Sciabarra, David Ramsay Steele, Thomas Szasz, Larry White

"Heady but good stuff."
—James Buchanan

in recent issues (complete list available):

LIBERTARIANISM DEBATED
Richard Epstein, Edward Feser, Jeffrey Friedman, Lowell Gallaway, Tom G. Palmer, Chris Matthew Sciabarra, Richard Vedder, Justin Weinberg

VOTER IGNORANCE AND DEMOCRATIC REALITY
Richard D. Anderson Jr.: The Media & Voter Ignorance
Jeffrey Friedman: Voter Ignorance & Democratic Theory
Tom Hoffman: Defining Rationality Down
Rogan Kersh: The Anti-Democratic Demos
Timur Kuran: Insincere Public Deliberation
Robert Y. Shapiro: Zaller's Theory of Voter Ignorance
Ilya Somin: Voter Ignorance and Democracy
Philip E. Tetlock: Do Voters Have the Right Stuff?
James Q. Wilson: Idealizing Democracy

"An inspiration to me."
—Hernando de Soto

RATIONAL CHOICE AND POLITICAL SCIENCE (double issue)
Robert P. Abelson: Expressive Behavior
Dennis Chong: Rational Choice or What?
Daniel Diermeier: The Role of Theory
John Ferejohn & Debra Satz: Rational-Choice Universalism
Morris P. Fiorina: Empirical Contributions
Stanley Kelley Jr.: Rational-Choice Limitations
Robert E. Lane: What Rational Choice Explains
Susanne Lohmann: The Poverty of Green & Shapiro
James Bernard Murphy: Social Physics
Peter C. Ordeshook: Engineering vs. Science
Donald P. Green & Ian Shapiro: Reply to Our Critics
Norman Schofield: Rational Political Economy
Kenneth A. Shepsle: Statistical Political Philosophy
Michael Taylor: Battering RAMs

GLOBALIZATION
Barry Eichengreen: Soros's Errors
George Soros: Reply
Douglas Irwin: Fearing Globalization
Garett Jones: The Asian Crisis
Deepak Lal: The Second Globalization
Jason Sorens: Why No Race to the Bottom?
Charles Wolf: Good Old Globalization

Back issues $10, double issues $20. One-year (4-issue) subscriptions: $29 U.S., $35 foreign, $15 student with copy of ID, $64 U.S. institutions, $72 foreign institutions/surface mail, $87 foreign institutions/air mail. *Critical Review* Business Office, P.O. Box 1085, Dept. 312, Emmett, ID 83617. Tel. (208) 365-9897, fax (208) 365-9893, e-mail info@criticalreview.com; author info and subscriptions via Web: www.criticalreview.com.