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REGULATORY STUDIES PROGRAM

**Public Interest Comment on**
EPA's Proposed National Emissions Standards for Mercury[1]
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The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of the impact of regulation on society. As part of its mission, RSP conducts careful and independent analyses employing contemporary economic and legal scholarship to assess rulemaking proposals from the perspective of the public interest. Thus, this comment on the Environmental Protection Agency's Proposed National Emission Standards for Mercury[2] does not represent the views of any particular affected party or special interest group, but is designed to evaluate the effect of the Agency's proposals on overall consumer welfare.

## I. Introduction

In high doses, there is little doubt that mercury is toxic to humans. Mercury exposure in utero can lead to tragic neurological effects in babies. In an effort to reduce human mercury exposure, the Environmental Protection Agency (EPA) is proposing to regulate the amount of mercury emitted from electricity generating utility units (power plants). Since the vast majority of mercury is consumed by eating fish and seafood, for this rule to be effective, the regulation would need to reduce mercury levels in fish and seafood. There is, however, little evidence the rule will accomplish this goal. Furthermore, there is little evidence that reductions in fish mercury levels would lead to improvements in human health or the environment. EPA's benefits analysis for this rule does not focus on the benefits of mercury reductions at all—instead it focuses on what it considers a side benefit of the regulation—reductions in particulate matter.

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[1] Prepared by Daniel R. Simmons, Mercatus Center Research Fellow. This comment is one in a series of Public Interest Comments from Mercatus Center's Regulatory Studies Program and does not represent an official position of George Mason University.

[2] Notice for the Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units; Proposed Rule, 69 Fed. Reg. 20, p. 4652 (Jan. 20, 2004) and 69 Fed. Reg. 87, p. 25052 (May 5, 2004). Docket ID No. OAR-2002-0056; FRL-7658-4.

EPA proposes some alternative approaches to achieve the proposed emission reductions, a couple of which would utilize a cap-and-trade system. While economic incentive mechanisms, such as cap-and-trade, can be more efficient at achieving environmental goals, they do not substitute for sound policy goals. If focused on the wrong metric (e.g., mercury emissions, when the health benefits are presumed to derive from particulate matter) or on capping emissions (without scientific or economic justification), trading mechanisms alone cannot ensure socially desirable outcomes.

EPA estimates that the proposal will cost at least $1.6 billion per year and maybe more than $4.5 billion per year,[3] with estimated capital costs of $8.2 billion.[4] American citizens will pay this cost, in the form of higher electricity bills and higher prices of goods and services.

## II. Statutory and Executive Guidance for the Regulation

### A. The Clean Air Act

On December 20, 2000, at the end of the Clinton Administration, EPA announced that under section 112(n)(1)(A) of the Clean Air Act, regulation of coal and oil fired power plants under section 112 of the Clean Air Act was "necessary and appropriate."[5] EPA stated in the December 20 finding, "coal- and oil-fired electric utility steam-generating units are significant emitters of HAP [hazardous air pollutants], including mercury which is emitted from coal-fired units, and which EPA identified as the HAP of greatest concern to public health from the industry."

EPA did not take any further regulatory action until January 30, 2004, when it issued a notice of proposed rulemaking to require a reduction in emissions of mercury from coal-fired power plants and nickel from oil-fired power plants.[6] The proposed rule provided two alternative ways of regulating mercury and nickel emissions. First, EPA proposed to establish national emission standards for hazardous air pollutants (NESHAP) under section 112 of the Clean Air Act (CAA) and to revise the regulatory finding it made on December 20, 2000.[7] Regulation under section 112 would either be with "maximum achievable control technology" (MACT) or with a cap-and-trade program under section 112, similar to the cap-and-trade program proposed under section 111 of the CAA.[8] As

[3] 69 Fed. Reg. 4712.

[4] 69 Fed. Reg. 4706.

[5] Regulatory Findings on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units, 65 Fed. Reg. 79,825 (Dec. 20, 2000).

[6] Notice for the Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units; Proposed Rule, 69 Fed. Reg. 4652 (Jan. 20, 2004).

[7] Regulatory Findings on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units, 65 Fed. Reg. 79,825 (Dec. 20, 2000).

[8] *Id.*

an alternative to regulation under section 112 of the CAA, EPA also proposed setting performance standards under CAA section 111 to establish a cap-and-trade program by which "mercury emissions from new and existing coal-fired utility units would be capped at specified, nation-wide levels."[9] This cap would come in two phases, first in 2010 and then a more stringent cap in 2018.[10]

According to EPA, these cap-and-trade proposals:

> Dovetail[ ] well with the sulfur dioxide ($SO_2$) and nitrogen oxides ($NO_x$) Interstate Air Quality Rule (IAQR) that was also proposed through a notice January 30, 2004 (69 FR 4565). That proposed rule would establish a broadly-applicable cap and trade program that would significantly limit $SO_2$ and $NO_x$ emissions from the power sector. The advantage of regulating Hg [Hg is the scientific symbol for mercury] at the same time and using the same regulatory mechanism as for $SO_2$ and $NO_x$ is that significant Hg emissions reductions can and will be achieved by the air pollution controls designed and installed to reduce $SO_2$ and $NO_x$. In other words, significant Hg emissions reductions can be obtained as a "co-benefit" of controlling emissions of $SO_2$ and $NO_x$. Thus, the coordinated regulation of Hg, $SO_2$, and $NO_x$ allows Hg reductions to be achieved in a cost effective manner.[11]

### B. OMB Circular A-4

Executive Order 12866 requires agencies to conduct a regulatory analysis for economically significant regulatory actions as defined by Section 3(f)(1). The Office of Management and Budget's (OMB) Circular A-4[12] provides OMB's guidance to Federal agencies on the development of regulatory analysis as required by Executive Order 12866, the Regulatory Right-to-Know Act, and other related authorities. The Circular explains that the purpose of a regulatory analysis is to:

- Anticipate and evaluate the likely consequences of a rule (both good and bad consequences).[13]

- (1) Learn if the benefits of an action are likely to justify the costs or (2) discover which of various possible alternatives would be the most cost-effective.[14]

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[9] *Id.*

[10] *Id.*

[11] NPR, 69 Fed. Reg. at 4652.

[12] Available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[13] OMB, Circular A-4, at 1.

[14] OMB Circular A-4, at 2.

- Inform the public of the effects of alternatives.[15]

To perform these functions, the Circular explains, "benefit-cost analysis is a primary tool for regulatory analysis."[16] The benefit of benefit-cost analysis is that it "provides decision makers with a clear indication of the most efficient alternative in terms of net-benefits to society."[17]

## III. The Benefits of EPA's Proposals

Circular A-4 advises agencies:

> To evaluate properly the benefits and costs of regulations and their alternatives, you will need to …explain how the actions required by the rule are linked to the expected benefits. For example, indicate how additional safety equipment will reduce safety risks. A similar analysis should be done for each of the alternatives.[18]

This section examines whether EPA justifies that reductions in mercury emissions are linked to expected benefits.

### A. Mercury is toxic to humans, but the dose makes the poison.

To evaluate the consequences of the rule, EPA's first step is to show that mercury is harmful. According to the Notice of Proposed Rulemaking:

> Mercury is toxic to humans from both the inhalation and oral exposure routes. In the proposed rulemaking, we focus on oral exposure of methylmercury as it is the route of primary interest for human exposures. Methylmercury is a well-established human neurotoxin although, as with many chemicals, the scientific community is divided on the specific dose and frequency of exposure required to elicit adverse effects. According to the NAS, chronic low-dose prenatal methylmercury exposure has been associated with poor performance on neurobehavioral tests in children, including those tests that measure attention, visual-spacial ability, verbal memory, language ability, fine motor skills, and intelligence.[19]

Mercury, when consumed in high doses, can be very harmful. For example, in Iraq in the fall and winter of 1971-72, wheat seed that had been treated with alkyl mercury

[15] *Id.*

[16] *Id.*

[17] *Id.*

[18] OMB, Circular A-4, at 2.

[19] NPR, 69 Fed. Reg. 4652, 4657–58.

fungicide—and was meant for planting—was mistakenly used to prepare bread.[20] More than 6,500 Iraqis were hospitalized with neurological symptoms and 459 died.[21] The mercury levels in the Iraqi mothers' hair was as high as 674 ppm.[22] By way of comparison, the highest percentile of mercury levels in American women of childbearing age is 1.4 ppm.[23]

While this tragedy in Iraq shows how harmful mercury can be, the important questions are: (1) how high are mercury levels in people in the United States, (2) how harmful are those levels, (3) and what affects those levels. Along those lines, EPA reports that:

> As part of routine U.S. population surveillance, the U.S. Centers for Disease Control (CDC) assessed Hg concentrations in blood of over 1,500 women of child-bearing age. A recent analysis of these data reported that about 8 percent of these women of child-bearing age have levels of Hg in their blood that are at or above the U.S. EPA's RfD [reference dose]. The CDC also surveyed the same group of women about their eating habits. The surveyed women reported eating shrimp and tuna more frequently than other fish and shellfish options. Hg concentrations in seafood may be largely responsible for elevated levels of Hg in U.S. women of child-bearing age. We have little information about how Hg emissions from U.S. power plants may affect Hg concentrations in shrimp, tuna, and other marine fish.[24]

### B. The Significance of the Reference Dose (RfD) Level for Mercury

What does it mean that 8 percent of women in the CDC's study had mercury levels in their blood at or above EPA's RfD? There are some complicating factors in figuring out the dose-response relationship between mercury levels in the body and adverse health effects. The first problem is that careful epidemiological studies have reached different conclusions about the level of mercury that is harmful.

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[20] Food & Drug Administration, *Mercury in Fish: Cause for Concern?* (Sept. 1994) available at http://www.fda.gov/fdac/reprints/mercury.html.

[21] *Id.*

[22] Center for Disease Control, *Blood and Hair Mercury Levels in Young Children and Women of Childbearing Age—United States, 1999*, 50 MORBIDITY AND MORTALITY WEEKLY REPORT 140, 142 (Mar. 21, 2001) available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5008a2.htm.

[23] *Id.*

[24] *Id.* at 4658.

### 1. The RfD is Based on the Studies that Show Effects at Lower Levels than Other Studies

As one researcher summarizes the epidemiological studies on mercury:

> Careful epidemiological studies of children exposed in the womb to higher methylmercury concentrations than those typically found in the United States have reached sharply different conclusions. A study of children in the Seychelles Islands found no association between methylmercury and a broad variety of health effects.[25] A study in the Faroe Islands found statistically significant associations in the domains of language, attention, memory, and—to a lesser extent—visuospatial and motor functions, but it did not examine broader measures of performance such as IQ tests.[26] A study of New Zealand children found declines in summary measures of neurological performance, but only if a single highly exposed and apparently healthy child is omitted from the analysis.[27,28]

In an effort to provide the most protection to human health, EPA relied on the Faroe Island study and the New Zealand study (the New Zealand study is an unpublished study)—the studies that showed effects from mercury exposure at lower levels than other studies. Researchers, however, have cautioned that the Faroe Island study may not be representative for several reasons:

- "The health effects estimated using the Faroe Islands data may depend in part on unique patterns of exposure, which came "mainly" from opportunistic consumption of whale meat that may have temporarily raised hair mercury levels above 8 ppm, more than twice typical levels."[29]

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[25] K. Crump et al., "Benchmark Concentrations for MeHg Obtained from the Seychelles Child Development Study," *Environmental Health Perspectives* 108, no. 3 (2000): 257–63; G. Myers et al., "Secondary Analysis from the Seychelles Child Development Study: The Child Behavior Checklist," *Environmental Research* 84, no. 1 (2000): 12–19; and C. Axtell et al., "Association between MeHg Exposure from Fish Consumption and Child Development at Five and a Half Years of Age in the Seychelles Child Development Study: An Evaluation of Nonlinear Relationships," *Environmental Research* 84, no. 2 (2000): 71–80.

[26] P. Grandjean et al., "Cognitive Deficit in Seven-Year-Old Children with Prenatal Exposure to MeHg," Neurotoxicology and Teratology 19, no. 6 (1997): 417–28.

[27] K. Crump, T. Kjellstrom, A. Shipp, A. Silvers, and A. Stewart, "Influence of Prenatal Mercury Exposure upon Scholastic and Psychological Test Performance: Benchmark Analysis of a New Zealand Cohort," *Risk Analysis* 18, no. 6 (1998): 701–13.

[28] The entire block quote is from Randall Luterr & Elisabeth Irwin, *Mercury in the Environment: A Volatile Problem*, 44 ENVIRONMENT 24 (Nov. 2002).

[29] *See* Phillipe Grandjean et. al., *MeHg Exposure Biomarkers as Indicators of Neurotoxicity in Children Aged 7 Years*. 150 AMERICAN JOURNAL OF EPIDEMIOLOGY 301, 302 (1999) and NATIONAL RESEARCH COUNCIL, TOXICOLOGICAL EFFECTS OF MEHG, 132 (2000).

- The whale meat consumed in the Faroes is high is PCBs. As Dr. Christopher DeRosa of the U.S. Department of Health's Agency for Toxic Substances and Disease Registry cautioned, "PCBs are at a levels 10 higher than in the U.S. in the Faroes, and at three times the level of FDA's tolerable daily intake."[30] He also stated that they didn't "really know" what the effects of PCBs might have been on the population in the study.[31]

Also, as noted above, the New Zealand study does not show adverse effects from mercury exposure if one single highly exposed and apparently healthy child is not omitted from the analysis.

**2. To account for uncertainty, compounding "safety factors" are built into the RfD.**

Different degrees of uncertainty surround predictions of environmental health risks, and regulatory agencies often adjust observed risk factors to account for that uncertainty. In creating the reference dose for mercury, EPA first estimated a "benchmark dose," by taking the lowest observable dose from the Faroe Island study (above) that was associated with cognitive effects (even though that association was observed in only one test—the Boston Naming Test—and not in other, broader tests of cognitive or intellectual performance).[32] To create the reference dose, EPA adjusted this benchmark level of 85 parts per billion (ppb) to 5.8 ppb, to account for uncertainties.[33]

The leading textbook on regulation notes that,

> "By erring on the side of conservatism, in effect government agencies distort the true risk levels by differing amounts…. The net result of the conservatisms biases is to generate a risk assessment that may bear little relationship to the actual risks posed, making it difficult for policymakers to determine which [situations] pose risks and which do not."[34]

It is important to recognize that no data show increased mortality or reduced cognitive performance at this reference dose level. The RfD level is a benchmark—it has not been scientifically shown to be a level that has significance in lowering cognitive performance.

[30] Dept. of HHS, FDA, CFSAN. Food Advisory Committee - Methylmercury. Transcripts of meeting July 23-4, 2002.

[31] *Id.*

[32] Randall Lutter and Elizabeth Mader, *Health Risks from Mercury-Contaminated Fish: A Reassessment* (Mar. 2001) available at http://www.aei-brookings.org/admin/authorpdfs/page.php?id=128.

[33] Joel Schwartz, *Comments on NRDC's Testimony on Power Plant Regulation* 6 (May 2003).

[34] W. Kip Viscusi, John M. Vernon, and Joseph E. Harrington, Jr. *Economics of Regulation and Antitrust.* 3rd edition. Pages 651, 652.

This puts in perspective the "8 percent of … women of child-bearing age [in the CDC's study] have levels of Hg in their blood that are at or above the U.S. EPA's RfD."[35] Eight percent of women have some elevated levels of mercury, but there are no data indicating that these women or their children will experience adverse health effects. In fact, not one woman in the study had blood mercury levels that reached 85 ppb, which was the lowest dose where any decline in cognitive performance has been observed.[36] This is not to say that EPA should not be concerned about elevated mercury levels, but rather that there is no direct evidence of adverse health effects at or near the RfD level.

### C. The link between mercury emissions and human exposure is not well understood.

A necessary step in understanding the benefits of this regulatory action is understanding the link between utility emissions and mercury blood levels, which in turn hinges on understanding the pathways of human consumption of mercury.

The overwhelming majority of mercury people consume comes from eating fish and seafood.[37] EPA reports that its "1997 Mercury Study RTC [Report to Congress] supports a plausible link between anthropogenic releases of Hg from industrial and combustion sources in the U.S. and methylmercury in fish."[38] The report also says that the analysis of mercury transport "relied heavily on computer modeling to describe the environmental fate of emitted mercury because no monitoring data have been identified that conclusively demonstrate or refute a relationship between any of the individual anthropogenic sources in the emissions inventory and increased mercury concentrations in environmental media or biota."[39] In other words, EPA says that there is a plausible link; even though EPA has no actual data that support such a link.

In the notice of proposed rulemaking, EPA states:

> Given the current scientific understanding of the environmental fate and transport of this element, it is not possible to quantify how much of the methylmercury in fish consumed by the U.S. population is contributed by U.S. emissions relative to other sources of Hg (such as natural sources and re-emissions from the global pool). As a result, the relationship between Hg emission reductions from Utility Units and methylmercury

[35] NPR, 69 Fed. Reg. at 4658.

[36] Center for Disease Control, *Blood and Hair Mercury Levels in Young Children and Women of Childbearing Age—United States, 1999*, 50 MORBIDITY AND MORTALITY WEEKLY REPORT 140, 142 (Mar. 21, 2001) http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5008a2.htm.

[37] NPR, 69 Fed. Reg. at 4658.

[38] *Id.* at 4658.

[39] Environmental Protection Agency, Mercury Study Report to Congress: Volume 1 Executive Summary 3-8 (Dec. 1997) (available at http://www.epa.gov/oar/mercury.html).

> concentrations in fish cannot be calculated in a quantitative manner with confidence.[40]

Not only is it difficult to calculate the relationship between mercury emissions and mercury concentrations in fish and how that relates to mercury levels in humans, human exposure to mercury comes from sources other than fish consumption. Others have examined the question empirically.

> Based on survey evidence linking mercury in women's hair to their fish consumption and the exposure-response relationships from epidemiological studies, the hypothetical ***complete elimination of mercury*** from fish would benefit only a relatively small number of children. Approximately 6,000 children would experience improvements in specific, narrow measures of neurological performance (between 13 percent and 22 percent of a standard deviation)—a small change. Larger numbers of children would experience even smaller improvements, assuming that the exposure-response relationships are valid at lower levels of exposure. Even very sharp cuts in U.S. power plants' mercury emissions would provide much more modest benefits because they would affect only one of many sources of mercury to which U.S. women are exposed.[41] [emphasis added]

The proposed rule does not propose a complete elimination of mercury emissions from power plants, as was hypothetically posited in the above paragraph. The proposed rule proposes reducing mercury emissions by about 30 tons. Because of the uncertainties of mercury deposition and transport, it is not known how this will affect mercury levels in fish, especially because 30 tons is a very small portion of world-wide releases of mercury.

According to EPA, the worldwide anthropogenic releases of mercury are about 5,500 tons per year.[42] EPA estimates that coal-fired power generators emit 48 tons per year each year.[43] To put that number in perspective, worldwide vegetation burning emits between 450 and 1200 tons of mercury emissions annually.[44] To further put the 48 tons of mercury emitted from U.S. power plants in perspective to other countries' emission of mercury, China emits 495 tons of mercury per year, Europe emits 168 tons per year, India

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[40] NPR, 69 Fed. Reg. 4652, 4658.

[41] Randall Lutter & Elisabeth Irwin, *Mercury in the Environment: A Volatile Problem*, 44 ENVIRONMENT 37 (Nov. 2002).

[42] ENVIRONMENTAL PROTECTION AGENCY, MERCURY STUDY REPORT TO CONGRESS O-1 (Dec. 1997).

[43] 1999 EPA Mercury ICR data, cited in http://www.epa.gov/ttn/atw/combust/utiltox/stxstate2.pdf cited in Environmental Protection Agency, Memo: Subject: Economic and Energy Impact Analysis for the Proposed Utility, MACT Rulemaking (Jan. 28, 2004) p. 2.

[44] Willie Soon, *Mercury Matters*, Tech Central Station (May 5, 2003) available at http://www.techcentralstation.com/050803F.html.

emits 117 tons per year, Australia emits 90 tons per year, and Zaire emits 90 tons per year.[45] Nevertheless, 48 tons per year could be significant if mercury levels in fish in the United States were mostly a function of mercury emitted from U.S. power plants. That, however, does not appear to be the case.

The greatest exposure to mercury, even among populations with high fish intake, comes from consumption of seafood caught in offshore waters, which would be negligibly affected by reductions in U.S. mercury emissions.[46] A New Jersey study found that tuna and shrimp were the most commonly consumed types of seafood, accounting for one-third of seafood consumption.[47] Yet more than 97 percent of all tuna marketed in the United States is caught on the high seas or imported from other countries; only about 3 percent of all shrimp marketed in the United States is caught within 200 miles of the Atlantic states that are downwind from utility plants.[48]

Thus, the data do not permit EPA to estimate how mercury emissions contribute to methylmercury levels in fish, nor the extent to which human exposure is due to consumption of fish. Without an understanding of the relationship between mercury emissions from utility units and human exposure to mercury, it is impossible to "explain how the actions required by the rule are linked to the expected benefits," as required by OMB guidelines.

### D. EPA relies on "co-benefits" to justify the costs of the proposal.

In the notice of proposed rulemaking EPA does not estimate the health benefits of reducing mercury emissions. The proposed rule includes a benefits analysis, but the benefits analysis calculates the benefits of reducing particulate matter larger that 2.5 microns ($PM_{2.5}$). In the proposed rule, EPA states "we are unable to quantify and provide a monetized estimate of the benefits at this time due to gaps in available information on the fate of [mercury and nickel] emissions . . . human exposure, and health impact models."[49]

It is understandable that EPA is reluctant to quantify the benefits of reducing mercury emissions. Instead, EPA examines the "co-benefits" of reducing mercury—primarily the health benefits associated with reduced emissions of particulate matter. Elsewhere (see Section II.A of this comment) EPA refers to reduced mercury emissions as a "co-benefit"

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[45] *Id.*

[46] EPA, Mercury STUDY REPORT TO CONGRESS 4-37 (1997) (available at http://www.epa.gov/oar/mercury.html).

[47] Id at 510. The study indicates that average mercury concentrations were 0.17 ppm for tuna and 0.11 ppm for shrimp.

[48] Lutter & Erwin (2000) calculations, based on U.S. National Marine Fisheries Service, *Fisheries of the United States* (1999).

[49] NPR, 69 Fed. Reg. at 4708.

of controls on $NO_x$ and $SO_2$ emissions.[50] This co-benefit methodology is confusing and potentially misleading.

EPA states, "the control technologies selected for analysis of the Hg portion of this action would also achieve reductions in $NO_x$ and $SO_2$."[51] In other words, when mercury is reduced in utility units, this also reduces the amount of $NO_x$ and $SO_2$. EPA continues:

> Because $NO_x$ and $SO_2$ contribute to the formation of $PM_{2.5}$, and because direct PM controls would be applied to meet the Ni requirements, these standards should lead to substantial benefits from reductions of ambient PM. Therefore, reduction of $SO_2$ and $NO_x$ emissions from utilities will contribute to reduced human health and welfare impacts. Due to both technical and resource limits in available modeling, we have only been able to quantify and monetize the benefits for a few of the endpoints associated with reducing Hg, Ni, directly emitted PM, and gaseous $NO_x$ and $SO_2$. However, based on relevant available modeling of several alternative control strategies to reduce Utility Unit $SO_2$ and $NO_x$ emissions (including Clear Skies), we can approximate the benefits of reduced exposure to ambient PM resulting from reductions in precursor emissions of $NO_x$ and $SO_2$. These benefit categories—including reductions in premature mortality—are believed to represent a dominant fraction of the total benefits associated with these proposed actions.

It is certainly true that technologies used to reduce one type of emissions may reduce another. This is a very familiar phenomenon, known in economics as "joint costs"—i.e., costs that jointly serve multiple objectives. There are standard methods of treating joint costs in a benefit-cost analysis, and EPA should use those standard methods rather than use the "co-benefit" concept.

If EPA wants to evaluate a stand-alone program to control mercury emissions, then it should calculate all of the benefits and costs of that program—and that would include any ancillary benefits from other pollutants that would be reduced, as well as any ancillary costs (or disbenefits) from other pollutants that might be increased. On the other hand, if EPA wants to evaluate a program that will simultaneously address three pollutants, it should calculate the costs and benefits of the entire program. Any economies of scale or scope (the joint costs) that result from the combined program will be reflected in the overall analysis.

Even if a combined program is contemplated, however, EPA should be sure that each component of that program is justified. For example, the agency should calculate the marginal benefits and marginal costs of including a cap on mercury emissions along with $NO_x$ and $SO_2$. Again, if significant joint costs exist, this will tend to support the inclusion

[50] *Id.* at 4652.

[51] *Id.* at 4709.

of mercury because the marginal cost of including it will be lower once the joint costs are "sunk."

With rulemakings proceeding on different tracks, it can be difficult to keep proper account of the various costs and benefits. EPA should make greater efforts to clarify which results flow from which decisions. For evaluating what to do about mercury, it would be helpful to produce all three types of benefit-cost analysis: standalone analyses for proposals to control only mercury, combined analyses for any proposed multi-pollutant programs, and incremental analyses that isolate the costs and benefits of including mercury in a multi-pollutant program.

### E. EPA's reliance on benefits from a reduction in $PM_{2.5}$ is not supported by scientific data.

In various recent rulemakings, EPA relies heavily on two studies (Harvard Six Cities study and the American Cancer Society—ACS—study) to derive large benefits from regulatory actions that reduce particulate matter. According to the total estimate of regulatory benefits tallied across all federal agencies by the Office of Management and Budget, EPA regulations comprise over 60 percent of the total benefits over the last 10 years (and over 75 percent of the reported upper-bound benefits). The majority of EPA's estimated benefits derive from reductions in exposure to one pollutant – particulate matter (PM). OMB's annual reports summarize the uncertainties associated with benefits attributed to PM reductions, and many commentators have questioned the methodology EPA uses to derive these high benefits.[52]

EPA's methodology for valuing the benefits of reducing PM concentrations yields such large benefits that EPA can use even incidental reductions in PM to justify the costs of a variety of regulations, including mercury emissions from utility units. As we have noted in other analyses and comments, however, EPA's approach is fraught with problems, and the case for increased mortality due to current levels of PM is much weaker than EPA claims.[53] The problems of uncontrolled confounding, latency time for disease development, and biologically implausible variations in the apparent $PM_{2.5}$-mortality association suggest that the reported relationship between $PM_{2.5}$ and mortality reported in the ACS and Harvard Six Cities studies is likely to be spurious and not representative of a cause-effect relationship.

[52] In our comments on OMB's 2001 report to Congress, we highlighted problems with EPA's estimates of these benefits, including (1) an unrealistic baseline, (2) uncertainties in the magnitude and causation of effects, (3) improper accounting for latency of effects, and (4) exaggerated valuation of health benefits. Public Interest Comment available at: http://www.mercatus.org/article.php/69.html.

[53] In our comments on EPA's proposed nonroad diesel engine and fuel standards, we described in detail the problems associated with EPA's assessment of the health benefits of PM reduction. http://www.mercatus.org/pdf/materials/381.pdf.

Even taking the ACS results at face value, $PM_{2.5}$ does not increase mortality for women or for those with more than a high school education. Together these groups make up 75 percent of the population. Thus, by a plain reading of the studies EPA relied on for estimating the benefits from the proposed rule, 75 percent of the mortality benefits claimed by EPA would never actually be realized.

## IV. Costs of the Proposed Rule

While EPA has not specified any actual benefits from the regulation of mercury itself, EPA has provided estimates for the monetary costs of implementing the different alternative regulatory approaches in the proposal. EPA estimates that the proposed section 112 MACT standard will cost $1.6 billion per year, while the section 111 program combined with the $SO_2$ and $NO_x$ requirements in the proposed Interstate Air Quality Rule will cost between $2.9 billion and over $4.5 billion per year.[54] It expects the rule will also impose $8.2 billion in capital costs.[55]

Circular A-4 points out that "opportunity cost" is the appropriate concept for measuring costs (as well as benefits). "Opportunity cost of an alternative includes the value of the benefits forgone as a result of choosing that alternative."[56]

The costs of meeting the requirements of the mercury proposal will be born largely by electricity ratepayers. When consumers, such as ratepayers, are forced to payer higher prices for goods and services, they will have less money to pay for improvements to the health and safety of themselves and their families. Researchers have found that "a $15 million decrease in income is associated with the loss of an additional statistical life."[57] This means that if all of these regulatory costs result in lost income, the rule will cost 107 statistical lives per year for the MACT-only standard and between 193 and 300 lives per year with the section 111 standard with $SO_2$ and $NO_x$ requirements in the proposed Interstate Air Quality Rule. The capital costs associated with section 112 MACT rule would cost an additional 545 statistical lives.

Because the expense of regulation costs lives, it is very important that EPA conduct careful analysis. The health benefits from controlling mercury emissions are highly uncertain, and EPA's analysis of the adverse health effects of $PM_{2.5}$ highly questionable and only tenuously related to the proposed rule.

[54] 69 Fed. Reg. 4712.

[55] 69 Fed. Reg. 4706.

[56] Circular A-4, p. 19.

[57] Randall Lutter, John F. Morrall, & W. Kip Viscusi, *The Cost-per-Life-Saved Cutoff for Safety-Enhancing Regulations*, 37 ECONOMIC INQUIRY 599 (1999). Their "best estimate" was $15 million, with a range of $10 million to $50 million.

### A. Critique of Cap and Trade

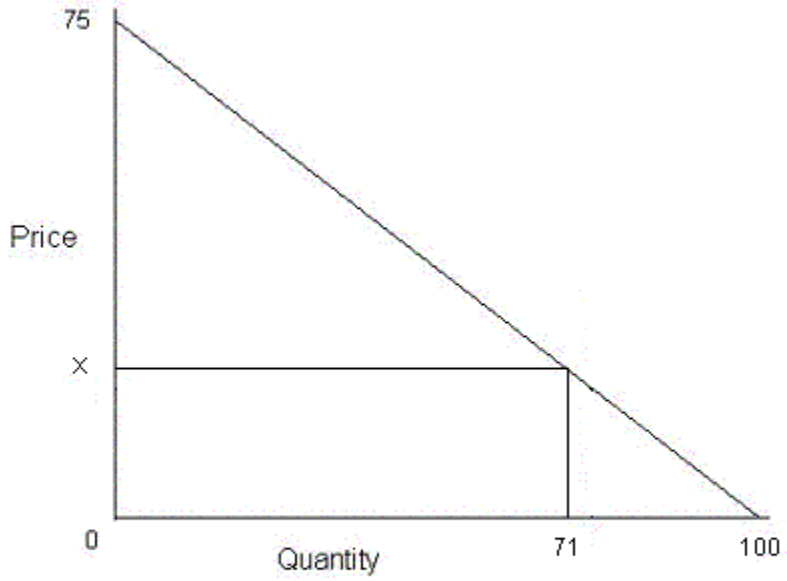
Market incentives, such as the cap-and-trade model rule included in this proposed rule, generally are more efficient at achieving policy goals than traditional command-and-control approaches. But the use of market incentives is not a sufficient condition for ensuring that a policy action maximizes, or even improves, social welfare. For cap-and-trade to improve social welfare, the cap (which is to say that the reduction of mercury emissions) must improve health, and the trading must be more efficient than other regulatory options.

In this case, there is little evidence the cap will promote improvements in social welfare. As noted above, it is doubtful that reducing mercury emissions from power plants will result in public health benefits. Therefore, there is no justification for a reduction of mercury emissions. Since the cap will increase the cost of electricity, this will only hurt consumers.

Second, conventional wisdom says that cap and trade is more efficient than command-and-control regulation. While this is likely true, mere efficiency is not enough of a reason to justify increasing the regulatory burden on consumers. The goal of reducing mercury emissions from power plants may be worthwhile, but EPA has not shown that it is worthwhile, nor has EPA shown that its regulation of mercury from power plants will achieve the goal of reducing mercury levels in humans.

Lastly, cap and trade may not be as efficient as previously thought. One reason for this is that a cap and trade program is subject to rent seeking.[58] Consider the following diagram:

[58] For a more thorough discussion of this phenomenon, see Brian Mannix, "The Calculus of Constraint," Mercatus Working Paper.




This diagram shows the hypothetical demand for mercury emissions. Without a cap on mercury emissions, firms emit 100 units of mercury since it is costless to the firm. In this example, a cap of 71 units[59] is placed on emissions of mercury. This increases the price for units of mercury emissions to x. The triangle on the right side represents the real-resource cost of compliance with the cap on emissions. In other words, the triangle's area of 14.5x ((100-71)x/2) is the cost associated with reducing emissions. The rectangle with height of x and length of 71 represents a transfer from consumers to the holders of the emissions permits. The area of the rectangle is 71x, or almost 5 times (71/14.5) the area of the triangle.

Because the costs of compliance will likely be passed on to consumers, the cost of the cap to consumers includes the area of both the rectangle and the triangle. The analysis of cap-and-trade proposals generally focuses on the size of the triangle (the compliance costs). What is generally not considered is the rectangle (the size of the transfer from consumers to emission permit holders). The area of the rectangle is much greater than the area of the triangle. The exact numbers are not important, but rather the significance of the rectangle. Depending on the rules of who allocates the allotments and to whom they are allocated, this decides who controls the transfer.

[59] A 29% reduction was chose since it EPA estimates a 29 percent reduction in mercury emission in 2010. *See* NPR, 69 Fed. Reg. at 4712.

When the government can allocate the transfer, it gives rise to what is called "rent seeking." Robert Tollison describes rent seeking as "the expenditure of scarce resources to capture an artificially created transfer."[60] Firms will allocate their resources in an attempt to capture as much of this value as possible. These resources will not be allocated to reducing pollution or producing electricity, but rather to influencing the allocation of the allotments of mercury emission so that they can benefit as much as possible from the regulation. These rectangles give firms the incentives to continually search for ways to appropriate as much of that value as possible—frequently through political and not economic means. This is inefficient since resources that are spent trying to gain political and regulatory favors are doing society no good at all.

The transfers from consumers to producers are likely to be dissipated through rent-seeking. This is more of a problem today than with the acid-rain cap in 1992, because utilities were subject to much more economic regulation than they are today, which likely caused those economic rents to be passed on to consumers. Today a different approach should be used. Instead of setting a cap, EPA should set a limit on the emissions factor (rate of mercury emissions per megawatt-hour of electricity produced). This approach can achieve the same level of emissions reduction, but at a much lower cost to consumers.

## V. Conclusion

Mercury is clearly toxic to humans at high doses, but EPA has not shown that (1) Americans face any health effects at current levels of exposure, or (2) the proposed rule will result in a decrease in human exposure to mercury. As a result, it is unable to quantify any benefits from the proposed rule to reduce mercury emissions from utility units.

EPA expects the alternative approaches proposed to reduce mercury emissions from utility units will cost American citizens $8.2 billion in capital costs, and an additional $1.6 billion to over $4.5 billion per year.[61] Unable to quantify any benefits from reducing mercury levels, EPA relies instead on the ancillary reductions in particulate matter to justify the proposal.

We recognize the problems EPA faces in addressing mercury risks, however, this approach is analytically incorrect, and misleads policy makers and the public as the to desirability of the proposal. The regulation of mercury emissions should stand on its own. To make Americans better off, the benefits of regulating mercury should outweigh the costs . EPA does not demonstrate that with this proposed rule.

[60] Jonathan H. Adler, *Rent Seeking Behind the Green Curtain*, 19 REGULATION no. 4 (1996).

[61] 69 Fed. Reg. 4712.

# APPENDIX I
# RSP CHECKLIST

| Element | Agency Approach | RSP Comments |
|---|---|---|
| 1. Has the agency identified a significant market failure? | EPA does not identify a significant market failure.<br><br>**Grade: F** | EPA has not identified a significant market failure because EPA has not shown that mercury emissions from U.S. power plants contribute to human health problems. Without harm, there can be no market failure. In fact, as proposed, this regulation will result in government failure because it will cost consumers billions of dollars a year and not produce any benefits from the reduction of mercury emissions. |
| 2. Has the agency identified an appropriate federal role? | EPA does not identify an appropriate federal role.<br><br>**Grade: B** | There is a federal role to regulating pollution that travels across state boundaries. EPA, however, has failed to link mercury emissions reductions to health problems. |
| 3. Has the agency examined alternative approaches? | EPA has proposed a couple different approaches to reducing mercury emissions—a MACT proposal and a cap-and-trade proposal.<br><br>**Grade: C** | EPA should be applauded for trying to use a trading system compared to command-and-control regulation. A cap-and-trade system, however, creates the opportunity for wasteful rent-seeking and EPA needs to recognize this fact.<br><br>A better approach would allow consumers to spend their own money on health and safety improvements instead of EPA forcing them to pay billions a year for a regulation that EPA cannot show will improve heath. |

| Element | Agency Approach | RSP Comments |
|---|---|---|
| 4. Does the agency attempt to maximize net benefits? | EPA relies on the "co-benefits" of reducing $PM_{2.5}$, but not does produce an analysis of the benefits of reducing mercury emissions.<br><br>**Grade: F** | EPA does not attempt to examine the benefits of reducing mercury emissions. EPA looks at the "co-benefits" of reducing $PM_{2.5}$, not mercury. This approach is analytically incorrect, and misleads policy makers and the public as to the desirability of the proposal. The regulation of mercury emissions should stand on its own. |
| 5. Does the proposal have a strong scientific or technical basis? | EPA relies on some careful epidemiological studies about mercury and public health, but excludes information from other, contradictory studies.<br><br>**Grade: F** | EPA fails to show how the regulation will have human health or environmental benefits. EPA fails to show that anthropogenic mercury emissions affect mercury levels in fish. Because EPA cannot estimate how the regulation will affect mercury levels in fish, it cannot estimate how the regulation will affect mercury levels in humans. |
| 6. Are distributional effects clearly understood? | A cap-and-trade system will result in a transfer from electricity consumers to the holders of emissions permits. A MACT approach will also result in transfer away from consumers.<br><br>**Grade: D** | If EPA proceeds with regulation, it should set a limit on the emissions factor (rate of mercury emissions per megawatt-hour of electricity produced). This approach can achieve the same level of emissions reduction, but at a much lower cost to consumers. And this approach would not transfer wealth from consumers to the permit holders. |
| 7. Are individual choices and property impacts understood? | EPA does not recognize that its proposal will limit Americans' ability to protect their own health and well-being.<br><br>**Grade: F** | The proposed regulation will divert consumer income toward increased utility bills, rather than other activities of their own choosing. |