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## **EPA claims about mercury have no scientific basis**

Important new scientific report challenges EPA claims about mercury risks from power plants

Real threat is from power plant closings, soaring electricity rates and lost jobs

For months, the Environmental Protection Agency has actively promoted much more stringent controls for mercury and other emissions from electricity generating facilities. To support its proposed new rules, EPA has repeatedly cited agency conclusions that mercury poses a threat to human health – particularly newborn and pre-natal children. It argues that coal-fired power plants are a major source of mercury in America’s atmosphere, streams, lakes and ocean waters, rendering fish unsafe to eat.

The new rules would force utility companies to spend billions of dollars retrofitting or dismantling dozens of existing coal-fired power plants – significantly and adversely affecting a sector that accounts for almost half of the nation’s total electricity generation. As the utility sector, labor unions, energy analysts and others have stressed, the adverse economic, employment, health and welfare impacts of this power generation loss would be devastating.

The EPA insists, however, that any impacts would be more than offset by improvements in environmental quality, quality of life and public health.

Dr. Willie Soon strongly disagrees with EPA’s assertions. Dr. Soon is a natural scientist with more than eight years of experience independently researching the impact of mercury and mercury compounds on wildlife and human health. Because the substance and tone of the EPA’ statements contrasted sharply with what he knew to be the scientific findings on mercury, Dr. Soon spent months scrutinizing the agency’s research and claims, to determine whether they met accepted standards of scientific inquiry.

His findings about the EPA approach to this “research” are startling and troubling. They also raise serious questions about the agency’s claims regarding the other pollutants covered by this proposed rulemaking, and the alleged health benefits of regulating them more stringently than they already are.

- EPA conducted no research of its own. Instead, it relied solely on a limited search of existing scientific literature. There was also no commonly accepted “peer review” of its findings.
- EPA’s literature search was highly selective. It ignored well-documented, respected and readily available research that conflicted with its apparently predetermined outcome and agenda.
- EPA abandoned its mission to serve the broader public welfare. Instead, it conducted a national campaign to generate public support for the rules, rather than seek and weigh differing viewpoints.
- EPA also failed to examine the most recent studies and analyses of mercury and other emissions from power plants, and other natural and human sources in the USA and around the world – even though pollution records show a remarkable declining trend of emissions from US power plants.
- EPA’s “findings” reflect a disturbing misunderstanding (or intentional distortion) of the science of mercury, its compounds (especially toxic and biologically available methylmercury) and its effect on fish and humans.

- EPA essentially manufactured a version of positive benefits – in social welfare, public health and economic gain. In addition, the agency deliberately ignored the easily demonstrated **adverse impacts** of dismantling affordable energy supplies and sharply increasing electricity prices, which would further damage the U.S. economy and cost hundreds of thousands of additional American jobs.

Dr. Soon’s report explains how EPA’s biased research has led to inappropriate conclusions and rules.

### **Power plants are an inconsequential source of mercury**

Fossil-fueled power plants are a convenient target for an agency that seeks to exploit public fears about mercury, in part by suggesting that mercury is a serious threat to the health of American children and adults. However, those concerns are exaggerated and misplaced, Dr. Soon concludes, and much of the common perception is due to frequent assertions and misstatements by the EPA itself.

Methylmercury is a well-known neurotoxin. At certain concentrations, it can affect the development of children’s brains and their ability to function and learn.

#### **FACT**

US power plants account for less than 1% of the total mercury in the atmosphere. The major sources of mercury are the result of natural processes, not human activity.

However, the potential “exposure risks” and “health threats” the agency alludes to simply do not exist.

The fact is, power plant mercury represents very little of the total atmospheric mercury in air masses circulating over North America. Therefore, slashing those emissions below already low levels will do virtually nothing to improve human health or environmental quality.

Moreover, EPA’s warnings about fish will actually worsen the health of many children, pregnant women and other adults, who may thus get insufficient omega 3 fatty acids.

According to the latest government, university and independent studies (all of them accessible, but many of them ignored or dismissed by the EPA’s literature search):

- All of America’s coal-burning power plants together emit about 41-48 tons of mercury per year.
- However, US forest fires discharge roughly the same amount: at least 44 tons per year. (Trees absorb naturally occurring mercury from rocks, soils, water and air, store it in their leaves and branches, and release it when they burn. Forest fires release still more mercury from superheated rocks and soils, and fires worldwide add still more mercury to the global atmosphere.)
- The cremation of human remains emits 26 tons of mercury per year (from tooth filling amalgams).
- Chinese power plants eject 400 tons per year, while Indian power plants add still more; and
- Volcanoes, subsea vents, geysers and other sources release 9,000 to 10,000 additional tons per year.

All these mercury (and other) emissions enter the global atmospheric system, become part of the air mass circulating over the United States, and contribute to deposition into US and other North American waters.

**Thus, America’s coal-fired electrical generating units are responsible for approximately 0.5% of mercury found in the air Americans breathe. Even eliminating every milligram of this mercury will not affect or reduce the other 99.5% in America’s atmosphere.**

### **Basic risk analysis demonstrates that mercury risk is virtually zero**

Modern instruments can detect mercury in very low amounts: sometimes in parts per trillion, the equivalent of a few seconds out of 3200 years. However, detection does not equal toxicity or risk.

Whether for aspirin, mercury or any other substance, it is the dose that determines the risk.

Mercury (Hg) deposition in fresh and ocean waters, its conversion to toxic and biologically active methylmercury (MeHg), and MeHg accumulation in fish tissue are all determined by numerous complex natural processes, most of which cannot be controlled by man.

**FACT**

For someone to suffer mercury poisoning and impaired mental function, many human actions and natural processes must come together in rare, unique and unusual ways.

For example, an Australian termite species produces methylmercury in its intestinal tract, and certain marine bacteria and microbes could be a source of (even more toxic) natural dimethylmercury.

Moreover, even where Hg and MeHg levels in fresh or saltwater are high, the presence of selenium in most fish prevents methylmercury from having toxic effects on fish or humans, because it bonds with mercury molecules and renders them biologically unavailable.

For someone to suffer mercury poisoning and impaired mental functions, many human actions and natural processes must act together in unique and unusual ways.

1. US power plant emissions must be much higher than current levels, especially compared to much more significant natural and non-US mercury sources.
2. Mercury deposition into fresh and ocean waters must also be well above natural observed levels, which depend on numerous natural factors.
3. Mercury to methylmercury conversion rates must be elevated. That also depends on many natural factors, such as local geology and water chemistry, whether an area is a wetland or open water, water temperature, daily and annual sunlight, time of year, and the entire biota of the ecosystem. (Some 200,000,000 tons of mercury naturally present in seawater could theoretically be converted into methylmercury. However, this mercury has never posed a danger to any living being.)
4. MeHg assimilation and accumulation by fish must be well above normal, and their selenium levels must be much lower than in most fish species. (Selenium levels are typically very low in pilot whales, which are mammals and are rarely eaten by Americans.)
5. Finally, children, pregnant women and other diners must eat large quantities of fish that have low selenium levels and high levels of available MeHg.

Each of these low probabilities and risk factors must be multiplied by the others, to get an accurate, realistic calculation of risk for American mothers and children.

Even assigning a very high 0.1 (10%) risk factor to each of these five components results in a calculation of  $0.1 \times 0.1 \times 0.1 \times 0.1 \times 0.1$  – which equals 0.00001 ... or **virtually zero risk to any American**. The EPA did not carry out this well-accepted exercise of risk calculation in reaching its conclusion about mercury risk.

## **Americans' blood mercury levels are already below even EPA's safety thresholds**

**FACT**

Health studies consistently show that mercury levels are steadily declining and that methylmercury in fish does not pose a threat to unborn babies or young children in the United States.

No substance on earth than can be totally eliminated – and the cost of attempting to reach “zero” emissions can be enormously disproportionate to the value of doing so. Thus the issue is whether EPA's very costly intervention is warranted and prudent. The facts say “no.”

The Centers for Disease Control's National Health and Nutrition Examination Survey actively monitors mercury exposure. Its studies have found that blood mercury counts for US women and children decreased

steadily 1999-2008, placing today's concentrations well below the safe level established by EPA.

The mercury exposure standard being sought by the EPA is 2-3 times more restrictive than the health-based standards already established by The Food and Drug Administration, World Health Organization and US Agency for Toxic Substances and Disease Registry. The EPA's standards are the most restrictive blood mercury "safe" levels in the entire world.

**Under FDA, WHO and ATSDR guidelines, no American children are even remotely at risk from mercury – from power plants or other sources. Lowering the risk standards even further, as EPA proposes to do, would not improve their health.**

EPA failed to recognize these facts, or factor them into its analysis and rulemaking decisions.

## **EPA's case for mercury threats to public health is largely fabricated**

EPA targets fish as the crucial entry point for mercury into the human body. And yet, health officials have never documented a single US case of unborn babies or young children suffering mental impairment owing to their mothers' consumption of nutritious fish – even fish with mercury levels well above the new ultra-safe levels established by EPA.

Essentially, EPA fabricated mercury risks by selectively screening out research that did not fit its rulemaking agenda. The agency based its "fish risk" claims on a single study of women and children in

### **FACT**

EPA's mercury standards are based on a study of people who consume large quantities of whale meat and blubber. It is irrelevant to American populations.

the Faroe Islands. This unique group of people eats few fruits and vegetables. However, they do consume large quantities of pilot whale meat and blubber, which is high in mercury *and* polychlorinated biphenyls (PCBs), but very low in selenium.

The study is irrelevant to Americans. However, it is being used to generate unfounded fears about mercury and fish. EPA also ignored the Seychelles Children Development Study, a rigorous 17-year evaluation of mercury risk to babies and children. That study found "no measurable cognitive or

behavioral effects" in children who eat five to twelve servings of ocean fish every week.

Moreover, nearly 87% of Japanese men, women and children have blood mercury levels above EPA's new "safe level" (5.8 ug/l). If EPA's ultra-safe level is truly health-based, it is only reasonable to expect numerous Japanese people would be mentally defective. That is clearly not the case.

The severe mercury poisoning, neurological damage and fetal defects that occurred in Minimata, Japan resulted from a chemical company's significant and continuous discharges of mercury and methylmercury into Minimata Bay, from 1932 to 1968. The toxic chemicals bioaccumulated in local fish and shellfish that were eaten by thousands of local people and animals. Neither the government nor the company addressed the problem until legal actions and an international outcry forced them to act. The tragedy has no relevance to US power plant emissions or industrial practices, or to EPA's proposed mercury rules.

## **Advisories to eat less fish actually harm US health**

### **FACT**

Omega 3 fatty acids are vital to proper nutrition. We need more fish – not less – in our diets.

Omega 3 fatty acids improve childhood brain and intellect development. They reduce heart attacks, strokes, cancer, diabetes, Alzheimer's and other problems. Eating less fish (because of mercury scares) compounds these health risks, Dr. Soon's report emphasizes.

As a result, EPA and its allies are not merely failing to improve Americans' health. **By advising against eating fish and ignoring the clear benefits of omega 3 fatty acids in fish, EPA and its allies are actively harming our health.**

## **Conclusion: EPA's proposed rules will harm public health and welfare**

The Environmental Protection Agency has tried to portray its proposed rules as generating a “rising tide” of public welfare, as a result of moving aggressively toward a renewable power society.

However, Dr. Soon's exhaustive review reveals that the agency has disregarded the facts and the obvious adverse consequences of its proposed actions – while pursuing an almost boundless expansion of its regulatory power over our environment, economy, jobs and lives, regardless of costs.

The Environmental Protection Agency's proposed “utility air toxics rules” will have profound and far-reaching adverse effects on energy reliability and affordability, on employment and economic recovery, and especially on millions of poor, minority and other proud, hard-working Americans and their families.

The proposed EPA rulemaking would cause unprecedented upheaval of core electricity supplies at a perilous time in our history and economy; certain and permanent job losses within the utility sector and in the broader economy; and declining public health and welfare, as more people lose their paychecks and low-income citizens must struggle even harder to pay their skyrocketing utility bills.

If America were to accept EPA's assertions about power plant mercury emissions and risks from mercury in the environment:

- The United States would be placed under probably the world's strictest standard for mercury emissions and blood levels of mercury in women and children.
- Many Americans would stop eating nutritious fish, or at least reduce fish consumption to one or two servings per month – thereby depriving themselves of essential omega 3 fatty acids.
- Utility companies would be forced to install enormously expensive new pollution controls on many of the nation's “baseload” coal-fired generating plants – or dismantle them.
- **These unavoidable actions would bring little appreciable reduction in mercury emissions. However, they would dramatically increase electricity prices, raise energy costs for thousands of businesses, cause hundreds of thousands of additional lost jobs, generate widespread social instability, and impair the living standards, health and welfare of millions of Americans.**

Dr. Soon's exhaustive study serves as a proxy for what the EPA should have done to honor its charter. He presents a compelling case that **the Environmental Protection Agency must start over ... and this time carefully, fairly, openly and objectively review and analyze *all* relevant health, environmental and economic studies, before moving forward on this major rulemaking.**

We hope this study will serve as a call for citizens, elected officials and other scientists to insist that EPA support its assertions and hold itself to the highest standard for:

- fair, balanced, objective review of *all* relevant medical and environmental studies regarding mercury and other power plant emissions;
- full analysis of the likely effects that the new rules will have, both positive and negative;
- appropriate peer review of its findings by experts from varied disciplines and perspectives; and
- adequate time for all interested parties to examine and comment on the studies and proposed rules.

The facts presented in this report should be part of that reconsideration.