

**Subcommittee on Commerce, Trade, and Consumer Protection  
Committee on Energy and Commerce  
U.S. House of Representatives**

**Testimony on H.R. 2190,  
The Mercury Pollution Reduction Act**

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May 12, 2009



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<sup>1</sup> The Center for Progressive Reform (CPR) is an organization of 60 academics from universities across the country specializing in the legal, economic, and scientific issues that surround federal regulation to protect public health, natural resources, and worker safety. One component of the Center's mission is to circulate academic papers, studies, and other analyses that promote public policy based on the multiple social values that motivated the enactment of our nation's health, safety and environmental laws. We seek to inform the public about scholarship that envisions government as an arena where members of society choose and preserve their collective values. We reject the idea that government's only function is to increase the economic efficiency of private markets. For more information, please see <http://progressivereform.org>.

Mr. Chairman and members of the Committee, thank you for the opportunity to appear before you today to testify regarding H.R. 2190, the Mercury Pollution Reduction Act. I come before you as an Associate Professor at Seattle University School of Law and a Member Scholar of the Center for Progressive Reform.

At least one in ten women of childbearing age in the United States has blood levels of mercury that threaten the neurological health of her newborn babies. Chlor-alkali plants are a major source of mercury pollution, and an entirely unnecessary source at that, because there's a cleaner and more efficient method of producing chlorine and caustic soda that uses no mercury whatsoever. The danger from mercury is particularly acute for communities that rely heavily on fish as a food source, including Native Americans, African Americans, and other communities of color and low-income communities. It's unacceptable simply to tell women to stop eating fish for several decades of their lives, until they're certain they won't have any more children – and yet that's basically the prevention strategy we're using.

For years now, we've tried waiting this problem out, allowing the chlor-alkali plants to switch over to mercury-free production methods on their own. It's time to stop waiting, and start requiring them to clean up their act, so as to reduce this serious and entirely unnecessary risk.

I would like to focus today on four points that counsel support for H.R. 2190.

### **Mercury Contamination Continues to Pose a Grave Threat to Children and Others in the United States**

Mercury is a potent neurotoxin. Exposure to even small amounts of methylmercury *in utero* or during childhood can lead to permanent neurological damage. Yet according to a recent study, some 10 percent of women of childbearing age in the United States have blood mercury levels that pose a risk to a developing fetus. This number nearly triples for women who designated their ethnicity as “other” (i.e., who are Native American, Asian American, or from the Pacific or Caribbean Islands) – fully 27.4 percent of women of childbearing age in this group have blood mercury above levels that pose a risk to a developing fetus, as established by the Environmental Protection Agency (EPA). Kathryn R. Mahaffey, et al, *Adult Women's Blood Mercury Concentrations Vary Regionally in the United States: Association with Patterns of Fish Consumption (NHANES 1999-2004)*, 117 ENVIRONMENTAL HEALTH PERSPECTIVES 47 (2009). The most recent data have revealed other human health risks from methylmercury as well, including adverse effects on the cardiovascular systems of adult men. In short, there should be no question that mercury poses a grave threat to the health of children and others in the United States. The National Academy of Sciences reached just this conclusion in 2000, and the scientific data gathered since have continued to buttress this conclusion.

Americans are exposed to methylmercury primarily through eating contaminated fish. This contamination results from both anthropogenic and natural processes.

Anthropogenic mercury emissions in the United States are currently dominated by just a few categories of sources, chlor-alkali plants among them. Mercury emitted from chlor-alkali plants is deposited to surrounding land and water – locally, regionally, and globally. Mercury then enters water bodies and becomes methylated: methylmercury is an extremely bioavailable form of mercury, readily taken up by fish in these waters. Methylmercury bioaccumulates in fish tissue, which in turn is a source of exposure to all those – including humans – that consume fish.

As a consequence of mercury contamination, health and environmental agencies have had to issue fish consumption advisories recommending that women and children reduce or eliminate entirely their consumption of some fish species. In the 1990s, advisories due to mercury were increasingly issued throughout the United States, with several states having to place all of their lakes, rivers, and coastal waters under advisory. In addition, 100 percent of Lakes Superior, Michigan, Huron, and Erie are under mercury advisory. In 2001, widespread methylmercury contamination prompted the Food and Drug Administration and the EPA to issue the first-ever national fish consumption advisory. This is an extraordinary indictment.

The EPA's response to this widespread contamination has been checkered. While EPA has required some industries to take real steps to reduce their mercury emissions, EPA has asked little of the chlor-alkali industry, coddling those plants that still use the outmoded mercury cell process. Yet each of these plants is a significant source of mercury emissions. The Olin Corporation plant in Charleston, for example, has consistently been the single largest source of mercury emissions in the entire state of Tennessee. In fact, source for source, chlor-alkali plants' mercury emissions dwarf those of many coal-fired utilities, although the latter sources have garnered more media attention. Taken together, the four remaining mercury cell chlor-alkali plants contributed over 2000 pounds of mercury pollution to the air in 2006. The industry reported decreased emissions as a group in 2007, but mercury emissions at some individual plants still dominate the emissions inventory. The Olin Corporation's Charleston plant, for example released 420 pounds of mercury to the air, an amount 41 percent greater than contributed by the average power plant in Tennessee in 2007. Due in part to the Olin plant's releases to the air and water, a stretch of the Hiwassee River bordering and downriver of the plant has been placed under consumption advisory for mercury and has been deemed by the Tennessee Department of Environment and Conservation as no longer "fishable."

To allow these mercury emissions to continue is to fail to protect many in the U.S. population, particularly communities of color and low-income communities that depend on fish for food. NATIONAL ENVIRONMENTAL JUSTICE ADVISORY COUNCIL, FISH CONSUMPTION AND ENVIRONMENTAL JUSTICE (2002). Indeed, while eating fish from the Hiwassee and other similarly contaminated waters would subject even the "average American" to unacceptable levels of risk, many Native Americans, African Americans, Asian Americans and others consume fish more often and in greater quantities than the "average American" – and so are exposed to even greater risks. Nor is it any solace to suggest that these people might take steps to protect themselves. If people "avoid" the

risks of mercury contamination by reducing their fish intake, they are made to forego the considerable health benefits of fish, which are an excellent source of protein, omega-3 fatty acids, and other nutrients. Consider the extraordinary burden that current mercury advisories place on a young girl, who must avoid fish throughout her childhood until age 20 and then throughout her childbearing years until age 49 – over half her life. Note, too, that for some, this burden will be felt not only in terms of physical or economic health but also in terms of cultural health; this is the case, for example, for many Native people.

### **The Harms of Mercury Emissions from Chlor-Alkali Plants are Completely Preventable**

The good news is that, in the case of chlor-alkali plants, the harms of mercury emissions are completely preventable. In fact, there are three technologies currently employed by chlor-alkali facilities, only one of which involves the use of mercury at all. While mercury cell technology was first enlisted to produce chlorine and caustic soda in 1894, alternatives to this outmoded technology have been available for more than 30 years. The mercury cell process has all but been replaced industry-wide: at present, some 95 percent of capacity at chlor-alkali plants is accounted for by processes using either the diaphragm cell or membrane cell technologies. These newer technologies are not only more efficient (a point taken up below), they are mercury-free. Plants don't purchase mercury; they don't discharge it to our rivers; they don't emit it to our air. Thus, the chlor-alkali industry presents an example of the rare "easy case" in terms of preventing toxic pollution: the industry has already developed an alternative technology that renders the use of mercury utterly unnecessary.

The phase-out called for by H.R. 2190 very sensibly capitalizes on this opportunity to eliminate hundreds of pounds of mercury emissions each year, while leaving intact the industry's continued ability to produce chlorine and caustic soda. The extraordinary nature of this opportunity becomes clearer when one recalls just how toxic mercury is in our environment: one oft-cited figure is that a mere 0.3 grams of mercury – about a teaspoonful – is capable of contaminating a 25-acre lake. Given mercury's toxicity, and given the serious impacts of mercury contamination on human health, it is important to seek whatever emissions reductions we can, from every possible source. Where, as here, the use of mercury isn't even necessary, the case for eliminating its use is especially compelling.

Even if, as the chlor-alkali industry suggests, the plants that use mercury can reduce a portion of their emissions, the point remains that *no* mercury emissions are warranted. One simply doesn't need mercury to produce chlorine and caustic soda. It should be noted, moreover, that the chlor-alkali industry continues to be dogged by questions regarding the fate of the mercury that it uses. Because mercury is merely a catalyst to the chemical reaction that produces chlorine and caustic soda, the amount of mercury at each facility should theoretically remain unchanged. But neither EPA nor the industry seems able satisfactorily to account for all of the mercury purchased for use by the chlor-alkali industry. The most recent set of questions was raised earlier this year, when *The Washington Post* covered the release of two studies finding that almost half of

the tested samples of commercial high-fructose corn syrup (HFCS) – an ingredient that is ubiquitous in food and beverage products, particularly those consumed by American children and teens – were contaminated with mercury. According to the *Post*, “[t]he use of mercury-contaminated caustic soda in the production of HFCS is common. The contamination occurs when mercury cells are used to produce caustic soda.” *Study Finds High-Fructose Corn Syrup Contains Mercury*, THE WASHINGTON POST (Jan. 29, 2009).

There are additional advantages to be gained from facilitating the chlor-alkali industry’s shift to mercury-free technology. Membrane cell technology can be as much as 37 percent more efficient in terms of energy use than mercury cell technology. These efficiencies are obviously appealing from the perspective of these companies’ bottom lines, and help explain why the four new chlor-alkali facilities that are or soon will be up and running have enlisted this newer technology. And while a shift from an energy-intensive process to one that is energy-efficient makes sense even at present, the potential that climate change legislation will render energy use even more expensive in the future makes such a shift that much more economically supportable.

### **The Costs of Delay are Large in Economic Terms and Unconscionable in Human Terms**

The costs of delaying action on these outmoded plants are large in economic terms and unconscionable in human terms. Thus, while it might seem tempting simply to wait and let the remaining mercury cell chlor-alkali plants run out the clock on the theory that the industry will soon enough convert or shutter these plants of its own accord, this would be a mistake. The costs of delay are demonstrated by methylmercury’s neurodevelopmental effects. In view of this impact alone, the failure to control mercury emissions from chlor-alkali plants can have irreversible consequences, affecting the intelligence and life prospects of the children in each new birth cohort who are exposed *in utero* to harmful levels of mercury. Each year of delay means another cohort of children born with preventable neurological damage. It is simply unacceptable to stand by and permit this harm to our children’s health for what amounts to the chlor-alkali industry’s convenience.

A team of scientists from the Mount Sinai School of Medicine’s Center for Children’s Health and Environment and elsewhere, led by Dr. Leonardo Trasande, has developed a method to calculate the societal costs of one component of this neurological damage – reduced cognitive abilities (as measured by intelligence quotient or IQ). Dr. Trasande and his colleagues estimated that, due to anthropogenic sources of mercury, 316,588 to 637, 233 children are born *each year* with cord blood mercury at levels > 5.8 µg/L, levels associated with neurological damage. “These infants suffer mercury-related losses of cognitive functioning ranging from 0.2 to 24.4 IQ points.” Leonardo Trasande, et al., *Mental Retardation and Prenatal Mercury Toxicity*, 49 AMERICAN JOURNAL OF INDUSTRIAL MEDICINE 153 (2006); Leonardo Trasande, et al., *Public Health and Economic Consequences of Environmental Methylmercury Toxicity to the Developing Brain*, 113 ENVIRONMENTAL HEALTH PERSPECTIVES 590 (2005). Dr. Trasande and his team also calculated the additional societal costs due to the increase in cases of mental

retardation (MR)(defined clinically as IQ <70) suffered by those children exposed *in utero* to anthropogenic mercury emissions each year, and found 1,566 excess cases attributable to these sources. It is crucial, of course, to recognize that chlor-alkali plants contribute only a portion of these anthropogenic mercury emissions. Yet, this contribution cannot be ignored given the seriousness of what is at stake.

One recent study has considered the societal costs attributable exclusively to chlor-alkali plants. This study, published just last week, estimated the losses in productivity that accompany the decreases in IQ due solely to mercury emissions from chlor-alkali plants. It placed this figure at \$3.9 million per year in 2006. Oceana, *Hidden Costs: Reduced IQ from Chlor-Alkali Plant Mercury Emissions Harms the Economy* (May, 2009). If the remaining four mercury cell chlor-alkali plants are permitted to continue to operate in similar fashion for even four to seven more years (the period that some studies have estimated as their useful lives), these yearly costs would be expected to tally from \$15.6 million to \$27.3 million.

This description of the costs of a delay, moreover, speaks only to a single impact of mercury contamination – losses in IQ suffered by those exposed prenatally. To this sum, one would need to add the societal costs of the myriad other adverse impacts of mercury contamination, on human and ecological health. These costs would include, for example, the costs of illness associated with cardiovascular impacts in adults, and the costs to the fishing industry when recreational and commercial fisheries are closed or consumer demand decreased due to fish consumption advisories.

And, of course, these numbers say nothing of the non-quantifiable costs of permitting continued mercury contamination. What of the diminished life prospects for those children on whom neurological damage will be visited? What of their anguish as they “struggle to keep up in school?” NATIONAL RESEARCH COUNCIL, TOXICOLOGICAL EFFECTS OF METHYLMERCURY (2000). And what if we could readily identify the children harmed by mercury and could gather their parents in a room: which of us would like to be the one to explain why it was a good idea to allow their children to suffer neurological damage because we didn’t want to require chlor-alkali plants to upgrade their production methods?

Legislative leadership is important, then, to facilitate the chlor-alkali industry’s timely transition to a more efficient, mercury-free process, and to guard against even a few year’s delay – given the large costs this delay would mean, whether understood in human terms or in terms of social utility.

### **Conversion to Newer, More Efficient Technologies Ensures Long-Term Viability of Chlor-Alkali Facilities, and the Communities and Jobs that Depend on these Facilities**

Finally, it is important to note the benefits of H.R. 2190 for the long-term viability of chlor-alkali facilities and the communities that they support. Whereas the four facilities that continue to use mercury cell technology may be able to sustain operations

for a few more years, evidence suggests that this approach is likely to be viable only in the short term. Facilities that have converted to the newer, more efficient membrane cell technology, by contrast, are likely to remain competitive – and provide jobs – for years to come. For example, ERCO Worldwide recently undertook the process of converting its facility in Wisconsin from mercury cell technology to a mercury-free process. According to the company, if they had not modernized, they would have had to shut down in five to seven years. By converting to a more efficient, mercury-free technology, however, ERCO estimated that it would be able to continue to provide jobs for 30 years. Moreover, when a chlor-alkali facility decides to convert to mercury-free technology, it not only preserves existing jobs but also creates new local jobs associated with the conversion. By facilitating conversion, H.R. 2190 functions to stimulate jobs for the architects, designers, electricians, plumbers, and mechanics needed to convert each facility; recent chlor-alkali plant conversions have created 200 to 250 such jobs. Oceana, *No Excuses: Communities at Risk Without Mercury-Free Technology* (Oct. 2008).

While a concern for environmental justice requires attention to environmental burdens and how these are distributed, it also counsels attention to economic impacts and on whom they fall. H.R. 2190 considers the health and well-being of those affected for the long haul – facilitating a transition to a process that will remain viable and competitive for years to come.

In summation, I'd make four points:

- Mercury pollution is dangerous, with significant health effects for children.
- The pollution is widespread, affecting 10 percent of women of child-bearing age.
- Chlor-alkali plants contribute hundreds of pounds to overall U.S. mercury emissions, every ounce of it unnecessary, because chlorine and caustic soda can be produced more efficiently and with zero mercury emissions.
- We allow the mercury cell chlor-alkali process to continue simply to convenience industry, and we pay for it with the health of our children. It's long past time to fix this problem.

Thank you for the opportunity to appear before you today. I would be pleased to answer any questions you may have.