

**REVIEW OF MERCURY POLLUTION'S IMPACTS  
TO PUBLIC HEALTH AND THE ENVIRONMENT**

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**HEARING**

BEFORE THE

SUBCOMMITTEE ON CLEAN AIR  
AND NUCLEAR SAFETY

OF THE

COMMITTEE ON  
ENVIRONMENT AND PUBLIC WORKS  
UNITED STATES SENATE  
ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

APRIL 17, 2012

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ONE HUNDRED TWELFTH CONGRESS  
SECOND SESSION

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# C O N T E N T S

Page

## APRIL 17, 2012

### OPENING STATEMENTS

Carper, Hon. Thomas R., U.S. Senator from the State of Delaware .....	1
Barrasso, Hon. John, U.S. Senator from the State of Wyoming .....	4
Lautenberg, Hon. Frank R., U.S. Senator from the State of New Jersey .....	5
Inhofe, Hon. James M., U.S. Senator from the State of Oklahoma .....	7
Alexander, Hon. Lamar, U.S. Senator from the State of Tennessee .....	12
Sessions, Hon. Jeff, U.S. Senator from the State of Alabama .....	13

### WITNESSES

Paulson, Jerome A., M.D., FAAP, Chair, Council on Environmental Health, American Academy of Pediatrics .....	16
Prepared statement .....	18
Archambo, Brenda, President, Surgeon for Tomorrow, and Michigan Out- reach Consultant, National Wildlife Federation .....	26
Prepared statement .....	28
Dudley, Susan, Director, George Washington University Regulatory Studies Center, and Research Professor, Trachtenberg School of Public Policy and Public Administration, George Washington University .....	30
Prepared statement .....	32
Holmstead, Jeffrey R., Partner, Bracewell & Giuliani LLP .....	39
Prepared statement .....	41
Driscoll, Charles T., Ph.D., Professor, Department of Civil and Environmental Engineering, Syracuse University .....	51
Prepared statement .....	53

### ADDITIONAL MATERIAL

NRDC Acknowledges Spikes in Energy Costs for Consumers Thanks to Obama EPA Regulations .....	93
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# REVIEW OF MERCURY POLLUTION'S IMPACTS TO PUBLIC HEALTH AND THE ENVIRONMENT

TUESDAY, APRIL 17, 2012

U.S. SENATE,  
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,  
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY,  
*Washington, DC.*

The Subcommittee met, pursuant to notice, at 10 a.m. in room 406, Dirksen Senate Office Building, Hon. Thomas R. Carper (Chairman of the Subcommittee) presiding.

Present: Senators Carper, Barrasso, Lautenberg, Merkley, Inhofe, Sessions, and Alexander.

## OPENING STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. We will come to order, please.

I appreciate the effort of all of our witnesses to be with us this morning.

It is good to see each of you, my colleagues.

Today's Subcommittee hearing is focused, as we know, on mercury pollution and its impact on public health and on the environment. The colleagues will have 5 minutes for their opening statement, and I will then recognize our panel of witnesses. Each witness will have 5 minutes for their opening statement. Following the panel's statements, each Senator will have 5 minutes for questions. We may have a second round of questions if we have time.

At 11 o'clock this morning there is going to be a vote, and the vote will be on whether to proceed to take up postal reform legislation, something that a few of us on this Committee have worked on long and hard. And so, we have got two things coming together at once and somehow we will figure out how to get it all done.

Let me just say that I believe that is possible to have a clean environment and a strong economy. When I ran for Governor in Delaware in 1992, believe it or not the question I received most often was what is it going to be—are we going to recession, people would say, if you are elected Governor, is it going to be the economy or the environment, and I, my response, I would just say both. We do not have to make that choice; we can do both. And subsequently we made great gains in our State both in a cleaner environment and in terms of job creation.

Some industries are being asked to make new clean air investments to significantly protect public health. Many are again posing what I think is a false choice between boosting our economy and

improving public health. And again, I say we can have both. We must have both.

Today we are focused on why we need to take an additional step to clean up our air. We will hear how our health and the health of our children are being threatened by mercury released in the air every day. We will hear how reducing mercury emissions in this country can impact our health here at home, reducing healthcare costs, helping us get better healthcare results for less money, really to help us move what I call a fee for service to a form of healthcare delivery where we are actually working to keep people healthy in the first place.

We have known for a long time that mercury is a neurotoxin that can damage our health, especially our children's health and development. In 1990 Congress had enough scientific information to list mercury as a hazardous air pollutant in the Clean Air Act. Lawmakers at the time, including me, thought that this action would ensure that our largest emitters of mercury would soon be required to clean up. Unfortunately, it has taken 22 years for the EPA to start regulating our largest source of mercury in this country.

Since 1990 our knowledge of where mercury comes from and its health and environmental impacts has only grown. We know that mercury emitted into the air is deposited into our water, and the water, we know that it gets into our food stream through our fish and fowl. We know that pregnant women eating contaminated fish are most at risk because they can transfer unhealthy doses to their unborn children, impacting the neurological developments of their babies.

We know that hundreds of thousands of babies are at risk every year from mercury poisoning. And we know that we have fish advisories in every State in this country, largely due to mercury. We also know that power generation remains the largest manmade source of mercury emissions in this country by far.

We will hear today that actions made here at home do make a difference. We will hear that we are only beginning to see the true costs of not cleaning up our mercury pollution. Mercury pollution is a local, regional, and global problem that must be addressed at the Federal level.

Since coming to the Senate I have worked with my friend Lamar Alexander and many of our colleagues to reduce mercury pollution from our power plants through legislation. We were not the only ones trying to reduce mercury pollution through Federal standards. Senator Inhofe, former Senator Voinovich, former President George W. Bush's EPA all supported Federal regulations for power plant mercury emissions.

In fact, one of our witnesses here today, Jeff Holmstead—nice to see you, Jeff—testified before this Committee, I think in 2001 as President Bush's new EPA Administrator for Air, on this very issue. During that hearing, I believe Mr. Holmstead testified in favor of reducing mercury pollution from our power plants stating then that mercury emissions are, and I think this is a quote, known to have a wide range of adverse effects on human health. He likened the health impacts of mercury to another deadly neurotoxin, and that is lead.

Fast forward to today and find that the EPA has acted to reduce mercury pollution from utilities. Unfortunately, some of my colleagues are still debating the science of mercury pollution and whether we need Federal standards to clean up this deadly air toxin. I hope today's hearing will put to rest this debate.

The emission of mercury into our air continues to pose a threat to the health of Americans, especially to the youngest most vulnerable among us. I believe we are making progress. Nonetheless, we need to make more of it. And thanks to the technological advances that are available to us today, we can make more progress and continue to grow our economy at the same time.

Dr. Barrasso.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER,  
U.S. SENATOR FROM THE STATE OF DELAWARE

I've always believed that it's possible to have a clean environment and a strong economy.

When I ran for Governor in Delaware in 1992, believe it or not, the question I received most often was, "Do you think we can have a strong economy and a clean environment?"

And I said, "I think it's a false choice to say that we have to have one or the other; we can have both." For the next 8 years, we did have both. We made great gains in Delaware in both improving our economy and strengthening our natural environment.

As some industries are being asked to make new clean air investments to significantly protect public health, many are again posing a false choice between boosting our economy and improving public health.

And I say again—we can have both.

Today we are focusing on why we need to take further steps to clean up our air.

We will hear how our health and the health of our children are being threatened by a silent killer released into the air every day—mercury.

We will hear how reducing mercury emissions in this country can impact our health here at home; reducing healthcare costs, helping us get better healthcare results for less money.

We've known for a long time that mercury is a neurotoxin that can damage our health—especially our children's health and development.

In 1990 Congress had enough scientific information to list mercury as a hazardous air pollutant in the Clean Air Act.

Lawmakers at the time—me included—thought this action would ensure our largest emitters of mercury would soon be required to clean up.

Unfortunately, it has taken 22 years for the EPA to start regulating our largest sources of mercury in this country.

Since 1990 our knowledge of where mercury comes from and its health and environmental impacts has only grown.

We know that mercury emitted into the air is deposited into our water. In the water, it gets into our food stream through our fish and fowl.

We know that pregnant mothers eating contaminated fish are most at risk because they can transfer unhealthy doses to their unborn child—impacting neurological development of the baby.

We know that hundreds of thousands of babies are at risk every year for mercury poisoning.

We know we have mercury fish advisories in every State in this country.

We also know that power generation remains the largest man-made source of mercury emissions in this country.

We will hear today that actions made here at home do make a difference. We will hear that we are only beginning to see the true costs of not cleaning up our mercury pollution.

Mercury pollution is a local, regional, and global problem that must be addressed at the Federal level.

Again, we've known for a long time that mercury pollution is a problem that needs to be addressed.

Since coming to the Senate I have worked with my friend Senator Lamar Alexander and many of my colleagues to reduce mercury pollution from our power plants through legislation.

We weren't the only ones trying to reduce mercury pollution through Federal standards. Senator Inhofe, former Senator Voinovich, and President George W. Bush's EPA all supported Federal regulations for power plant mercury emissions.

In fact, one of our witnesses here today, Jeff Holmstead, testified before this Committee in 2001 as President Bush's EPA Administrator for Air on this very issue.

During that hearing, Mr. Holmstead testified in favor of reducing mercury pollution from our power plants—stating then that mercury emissions are “known to have a wide range of adverse effects on human health.” He likened the health impacts of mercury to another deadly neurotoxin—lead.

Fast forward to today, and finally the EPA has acted to reduce mercury pollution from utilities.

Unfortunately, some of my colleagues are still debating the science of mercury pollution and whether we need Federal standards to clean up this deadly air toxic.

I hope today's hearing will put to rest this debate.

Mercury pollution is a real threat and must be reduced in this country to safeguard our health, protect our natural environment, and preserve clean air for generations to come.

**OPENING STATEMENT OF HON. JOHN BARRASSO,  
U.S. SENATOR FROM THE STATE OF WYOMING**

Senator BARRASSO. Thank you very much, Mr. Chairman.

I want to welcome the witnesses here today. I would especially like to welcome former EPA Assistant Administrator Mr. Holmstead. Thank you for being here.

And Ms. Dudley, thank you, a Senior Research, a Research Professor of Public Policy and Public Administration as well as Director of George Washington University's Regulatory Studies Center. Both are experts in regulatory affairs, and I believe that their expertise in crafting sound regulations is going to benefit us greatly in this hearing.

I would also like to welcome our other witnesses, Mrs.—I am sorry—Ms. Brenda Archambo who is the President of Sturgeon for Tomorrow. I have followed your work in advocating on behalf of sturgeon, and I am told that you are referred to as the Sturgeon General. Congratulations.

[Laughter.]

Senator BARRASSO. Welcome. I would also like to welcome Dr. Driscoll. In addition to his being affiliated with Syracuse University, he also has published numerous EPA-funded papers and continues to hold a number of positions with the EPA under this Administration.

I would also like to welcome Dr. Paulson, who is the Chair of the American Academy of Pediatrics' Council on Environmental Health. The Academy has a long history of advocating for children's health issues and been a champion on a number of issues over the years.

Many of the witnesses before us today are going to talk about the health threats of mercury. No one—no one at this hearing, on the dais or the people testifying—no one believes that mercury is not a threat if ingested in doses that exceed strict limits set by the EPA and other world health organizations.

As they say though, the dose makes the poison. We all want to protect children from dire health consequences of mercury exposure. The issue is how best to regulate mercury in a way that saves the most lives and helps keep our economy strong.



One of the witnesses today, Ms. Archambo, stated in a 2002 Sturgeon for Tomorrow newsletter that “personally, one of the greatest lessons I have learned is that there are times we must say no to the good to say yes to the best.” I disagree. I am a firm believer that we should never let the perfect be the enemy of the good.

In 2005 the Senate had an opportunity to address mercury exposure by reducing mercury emitted by power plants by 70 percent. It happened in this very Committee. There was a 9 to 9 vote. Nine Senators voted against the 70 percent mercury reduction, which was included in what was called the Clear Skies Bill. One of those Senators who voted against the 70 percent reduction of mercury was a Senator named Barack Obama. Voted against in a 9 to 9 tie vote.

So, I have heard statements from some of my colleagues that even if we saved one life because of the EPA’s Utility MACT rule, it would be worth it. It would be worth it despite its \$10 billion price tag for what has been listed as only \$6 million in benefits. According to the EPA’s own number, \$10 billion price tag, \$6 million in benefits.

My question is, how many people could have been saved between 2005 to today had that 70 percent reduction in mercury passed this Committee and had been then signed by the President into law?

I know the bill was not perfect. I was not in office at the time, but perhaps those nine Senators, both Republicans and Democrats, including then Senator Barack Obama, let the perfect be the enemy of the good.

Well, I will reiterate that we can save a lot of lives with \$10 billion. We can and should do better than the EPA’s current Utility MACT rule. I hope that the witnesses before us today—especially the ones who are experts in regulating things as opposed to just stating the known fact that mercury can be a health threat—can shed some light on the best ways to reduce mercury pollution, reduce it in a way that protects the public health as well as protects the economy.

The jobs that will be lost from the EPA’s Utility MACT rule and the slew of other EPA rules targeting coal-fired power plants will lead to serious health impacts to the public. When Americans lose their jobs their health and the health of their children suffer. Those are the findings of a new report, a minority report that was filed in this Committee, Red Tape Making Americans Sick, a Report on the Health Impacts of High Unemployment. Just as we must look at the cumulative impact of mercury accumulation in fish, we must also look at the cumulative impact of unemployment on public health.

Thank you, Mr. Chairman. I look forward to the testimony.

Senator CARPER. Thank you, Dr. Barrasso.

Senator Lautenberg, you are next. And then I think Senator Inhofe.

**OPENING STATEMENT OF HON. FRANK R. LAUTENBERG,  
U.S. SENATOR FROM THE STATE OF NEW JERSEY**

Senator LAUTENBERG. Yes. Thanks, Mr. Chairman, for convening this hearing, because as our colleague Dr. Barrasso said, every one

of us is clearly looking at their children and grandchildren and saying what do I have to do to protect them? What is it worth to save 300,000 a year from being afflicted by mercury and having their IQ reduced, their ability to function limited? There is no price too high to pay for that, in my view.

I know this. I was in the Army, and so were other veterans here. And we paid plenty of money. We brought out the forces. We wanted to protect ourselves from a nuclear threat, from bomb threats from terrorists, all of those things. Why did we do it? We did it to protect our families and our well-being. And that is what this is about. The same thing. It is critical for these children, for their well-being, to fully understand lessons in school, get good marks, and compete in the classroom.

There is little doubt—and we heard it—that mercury is one of the most toxic pollutants that we face. It is a poison that attacks the brain. I do not think that you see that. It is not like the wound from the outside, in their nervous system, you do not see that, but the effects are definitely there.

Young children and developing fetuses are especially vulnerable to mercury poisoning. Pregnant women who are exposed to high levels of mercury can give birth to babies who suffer from brain damage, learning disabilities, hearing loss. According to the EPA, more than 300,000 babies a year are born with mercury levels high enough to cause developmental problems and learning disability—300,000 a year. What is that doing to future populations in America?

The bottom line is this. We should not allow the poisoning of our children to continue. And that is why I applaud the EPA for setting new pollution standards for mercury and other toxic air pollutants.

For the first time in history power plants across the country will be required to cut mercury pollution by as much as 90 percent. EPA has also set important standards that will prevent 15,000 pounds of mercury pollution coming from industrial boilers every year. In the fight for public health and cleaner air, this is a major victory, one of the biggest gains in a generation. These standards have been in the making since 1990 when both Democrats and Republicans came together to pass the Clean Air Act amendments that require the EPA to set strict limits on pollution.

But now the polluters and their friends, friends in the Congress, are stalling, claiming it is going to cost business too much, too much money to comply, cost jobs. A lot of this is really doubtful. There is nonsense. EPA standards simply ensure that all companies use the maximum available controlled technology.

The cleanest plants in our country have already demonstrated that they can succeed by investing in clean technology. For those who disagree, I say come to New Jersey and look at its largest public electric utility, Public Service Electric & Gas. They cut the emissions of mercury and acid gases by 90 percent. At the same time, the company created more than 1,600 jobs, maintained steady rates, and kept the lights on. PSE&G proves that solutions are available and that the problem is too big to ignore.

Every State in the country has issued advisories against eating fish from lakes and streams because of high levels of mercury contamination. And pregnant women are advised to limit their con-

sumption of fish due to mercury contamination, despite the multiple health benefits of eating fish.

We have the technology to cut mercury pollution from coal-fired power plants and industrial boilers. But now we have got to put this technology to work to protect pregnant women and ensure the healthy brain development of our children.

My colleagues need to make a choice. You can either stand up, protect Americans from toxic poisons, or you can fall for more excuses from polluters. Job loss is terrible. But life loss is even worse. I choose to continue fighting for the health of our families.

Mr. Chairman, I look forward to hearing from our witnesses about how we can work together to ensure that all Americans have clean air to breathe and are protected from toxic mercury pollution.

Thank you.

Senator CARPER. Thank you, Senator Lautenberg.

Senator Inhofe.

**OPENING STATEMENT OF HON. JAMES M. INHOFE,  
U.S. SENATOR FROM THE STATE OF OKLAHOMA**

Senator INHOFE. Thank you, Mr. Chairman.

I am glad we are having this hearing. I just wish we had the hearing before the rule went final. This is going to go down as the most costly rule in the history of the EPA. And there is a lot of competition for that title. And so we have to look at this and say, what can we really do about mercury? Because this does not do it.

And I want to tell Senator Alexander, who has been concerned about mercury for about as long as anyone I know, that if we can address this properly, and if we can, maybe the Attorneys General will be successful in striking this down, that we can then get busy and do something to really address mercury.

I can remember, and so can the Chair remember, back when Republicans were the majority we had the Clear Skies Act, and that was the largest reduction of pollutants in the history of this country. It was held hostage because it did not include greenhouse gases. So, what they are saying is, we do not care about doing away with pollution unless we get our program in there. And that is what happened.

So, I think if you look at the background, the history of this, Republicans have made really great efforts. That was 2005. I remember the arguments. I remember the hearings that we had here. But I do not think this rule is about reducing energy. I think it is a part of the Obama attack on affordable energy in the United States, to kill coal, put us in a situation where it is going to be a real economic disaster.

And by the way I say to one of our witnesses, Ms. Dudley, that I am going to kind of pursue this with you during the question and answer time because you have a background certainly that lends itself to the economics of this thing, and we are doing something that most people are not aware of. When I say the most costly rule in the history of the EPA, some might say well maybe the next program. Well, that is a standard. That is not a rule. This is a rule, the most costly rule, Mr. Holmstead, in the history of the EPA.

So, I think we need to pursue that. To think, and it was said by the Ranking Member of the Subcommittee, that \$10 billion is the

cost but only \$6 million goes toward doing something about mercury. I mean, that is shameful that we would even be doing it this way.

If we want to do something about mercury, and let me give the assurance, if we are able to do something with my CRA, Congressional Review Act, I think we all know how that works, that means you have to have 30 co-sponsors and then you can override this type of a rule that comes from unelected bureaucrats primarily. So, hopefully that will be successful. We already have the 30, by the way, so we are well on our way to doing something about this, and I hope the CRA will be.

So, we have all of these Attorneys General out there, 24 of them. I know there are more because my State of Oklahoma is not among the 24, and they are going to be, they are going to be in there. So, there are a lot more that are looking at this and thinking that this is really the coal benefit effort here, the 2.5 particulate matter reductions are being used in such a way as to make it look like this is a very real attack on mercury, which it is not.

It is not about public health. If it were, the EPA would not have to trick the public into relying on phony coal benefits. If it were, the EPA would have shown more rigor in analyzing the jobs that will be lost across the country and the health impacts that joblessness has. No, this is not; this rule is about killing coal in the furtherance of Obama's illogical cap-and-trade agenda.

Lisa Jackson told us as much. I have always been very fond of the Director of the EPA, Ms. Jackson. She said it is about leveling the playing field between power providers, which will make electricity more expensive which, incidentally, is one of the promises that President Obama made back when he was running for office. It is going to be expensive, very expensive, and this is one step in that direction to increase the costs of electricity.

And of course right now with all the efforts that are taking place, next month we will see another effect on these closures as PJM holds its future capacity auctions, increasing electricity rates. UBS estimates that prices could increase by 60 percent in Ohio. Elsewhere in the country, Midwest Independent Transmission System operators estimate that electricity rates could increase by as much as 50 percent. That is nationwide. These effects were known as the rule was developed, but the EPA chose to ignore them.

So, we are going to pursue this. When the American people realize those of us who really want to do something about mercury find that we are paying \$10 billion of which \$6 million—\$10 billion, \$6 million—I think that is 1,600 to 1 on PM as opposed to doing something about mercury.

So, during your opening statement, and you be thinking about this, Ms. Dudley, because once this message gets out, it is a real message that people will respond to.

Thank you, Mr. Chairman.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE,  
U.S. SENATOR FROM THE STATE OF OKLAHOMA

I want to thank our witnesses for joining us for today's hearing. Additionally, Chairman Carper, thank you for holding this second hearing focused on the Utility MACT, or MATS, rule. Utility MACT is the most costly rule in the history of the

EPA—one that typifies President Obama’s war on affordable energy. It is fitting we would focus additional oversight efforts on this rule. I only wish we had done so before the rule went final and the negative impacts started to be felt.

Let me begin today with some news today. As of yesterday, 24 State attorneys general, including one-quarter of all Democratic State attorneys general, had filed petitions challenging Utility MACT. This includes some States that should catch everyone’s attention: Arkansas, Kentucky, Missouri, Mississippi, West Virginia, and Wyoming. It is clear that there is tremendous bipartisan concern from the States about EPA’s regulatory onslaught.

To be clear, Republicans are for reducing mercury emissions. In fact, my Clear Skies Act was the first bill that reduced mercury from coal-fired power plants. Unfortunately, Clear Skies was killed by radicals in the environmental movement because it didn’t embrace their global warming agenda. Those opponents included President Obama, who was a member of this Committee at the time. Undeterred by that defeat, in 2005 the Bush administration sought to issue mercury regulations under the Clean Air Act. But that rule also fell victim to environmental groups’ court challenges.

So today we would do well to remember that it is Republicans who first sought to reduce mercury, and it’s the environmental establishment that has stopped progress for more than a decade.

But this rule isn’t about reducing mercury. It’s part of President Obama’s grand strategy to end affordable energy in the United States and kill coal. Like Obama’s cap and trade regulations, Utility MACT is not interested in environmental protection or promoting human health. Backed by false claims and EPA propaganda, this rule will fulfill Obama’s campaign promises of skyrocketing electricity rates and bankrupt the coal industry.

EPA calls this the “Mercury and Air Toxics” rule, but the Agency admits the benefits of reducing mercury are astonishingly small—especially when considering the rule’s price tag, roughly \$10 billion annually. EPA estimates the benefits of reducing mercury to be \$6 million or less. That’s a cost-benefit ratio of approximately 1,600 to 1. You can see the gulf between benefits and costs in this chart, which I request be entered into the record.

This rule cannot be justified on the merits. But instead of working to reduce the rule’s cost, EPA conjures up additional benefits to fool the public into thinking they are getting a good deal. EPA does this by tallying up the “co-benefit” of additional PM<sub>2.5</sub> reductions.

In so doing, EPA is conveniently forgetting that it already has in place more cost effective Clean Air Act mechanisms to reduce PM<sub>2.5</sub>. Worse still, the Agency is claiming benefits from reducing PM<sub>2.5</sub> to levels below the National Ambient Air Quality Standard (NAAQS)—even though this air is, by definition, clean.

This rule isn’t about public health. If it were, EPA wouldn’t have to trick the public by relying on phony “co-benefits.” If it were, EPA would have shown more rigor in analyzing the jobs that will be lost across the country and the health impacts that joblessness has. No, this rule is about killing coal in furtherance of Obama’s ideological cap and trade agenda. In fact, this was confirmed by Lisa Jackson—this rule is about “leveling the playing field” between power providers—which will make electricity more expensive for everyone.

And now American families have to pay the cost—real costs, compared to EPA’s phony benefits. At our last hearing we heard about the closure of a GenOn plant in Avon Lake, directly attributable to EPA actions. The loss of tax revenue from this will hurt schoolchildren’s education and reduce emergency services in the community. This is a story that will be repeated in community after community. As of today, nearly 22 gigawatts operating in 20 States are slated to shut down due to EPA.

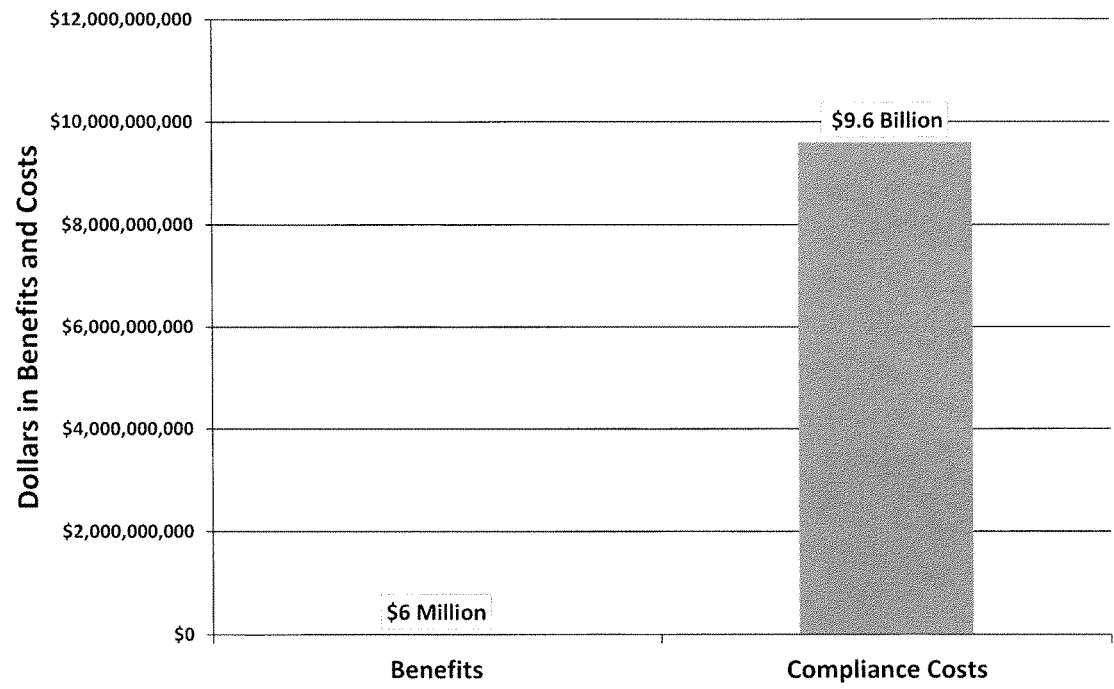
Next month we will see another effect of all these closures as PJM holds its Future Capacity Auctions—increasing electricity rates. UBS estimates that prices could increase by 60 percent in Ohio. Elsewhere in the country, MISO (Midwest Independent Transmission System Operators) estimates that electricity rates could increase by as much as 50 percent. Last fall this rule was estimated to increase electricity prices by as much as 20 percent and cost the economy 1.64 million jobs. These effects were known as the rule was developed, but EPA chose to ignore the warnings.

This regulation needs to be stopped. My resolution of disapproval on Utility MACT will send EPA back to the drawing board, where they can consider the full range of their rule’s impact. Contrary to claims, a CRA doesn’t amend the Clean Air Act or keep the agency from regulating mercury. Rather, it would result in EPA writing mercury regulation in a manner consistent with congressional direction—

namely, in a way that reduces mercury but that doesn't unduly harm Americans or eliminate their jobs.

[The referenced material follows:]

### Utility MACT: Cost versus Benefits



Source: National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, Final Rule. <http://www.epa.gov/mats/pdfs/20111216MATsfinal.pdf>, pages 664.

Senator CARPER. Thank you, Senator Inhofe.  
Senator Alexander.

**OPENING STATEMENT OF HON. LAMAR ALEXANDER,  
U.S. SENATOR FROM THE STATE OF TENNESSEE**

Senator ALEXANDER. Thanks, Mr. Chairman.

Here is my view. My view is that there is no excuse, given technological advances, for operating coal plants that do not have advanced pollution control equipment on SO<sub>x</sub>, NO<sub>x</sub>, and mercury. Every year since I have been a Senator I have introduced, with Senator Carper, legislation to do that. And the industry wanted to delay, and the environmentalists wanted standards that were too strict, and so Congress has ceded its authority to the EPA, which I do not like.

If the Carper-Alexander had passed in 2010, industry would have had 5 years to deal with a 90 percent mercury standards, and you know we would be half-way there if we had done that. And with a law, we would have many fewer, many fewer lawsuits to try to stop it.

I think another thing to say is that Congress told the EPA in 1990 to regulate mercury and a number of other harmful pollutants. And then the Courts told the EPA in 2008 to regulate mercury and a number of other pollutants. I do not think we—Dr. Barrosso said that none of us like mercury. We all understand it is a particular nasty element, and if we have advanced technology that can get rid of 90 percent of it in coal-fired power plants, we ought to do that. And ought to do it as quickly as is reasonably possible.

If I were king today, I would do it in 6 years, and I think the best way to address it would be for Congress to stop ceding its responsibility to EPA and to pass a law adopting this same rule and giving the utilities 6 years to do it. I think we would probably get the environmental benefits more rapidly because of lack of lawsuits if we did that.

Now, as to the costs, for a moment. I have great respect for Senator Inhofe, and he is correct. The EPA does say that about \$10 billion is the cost of this. But they also say that the cost of the whole rule is \$37 billion to \$90 billion in benefits. And it is true that mercury is not the only part of this rule. There are a number of other pollutants, but they are all harmful pollutants, they are acid gases, and hydrochloric acid and particular matter, or soot, which is a very dangerous element in the air which makes a lot of people sick.

Now, how much will it cost, and will it kill coal? I do not think that will happen. I mean, the EPA also says its estimate is that it will add 3 percent to the cost of the electric bill, this rule. That is about \$3 a month in most, at least in our State.

The Tennessee Valley Authority, the largest Federal utility, has announced that it is going to close some of its oldest and dirtiest coal plants, especially because of the low cost of natural gas today, but that it is going to keep open 38 of them, and by 10 years from now have all of the pollution control equipment on that it needs to have for SO<sub>x</sub>, NO<sub>x</sub>, and mercury. That will mean TVA will be producing about one-third of its electricity from nuclear, about one-third from coal, and about one-third from natural gas. I want us



to continue to use coal. I think coal's future is brighter if we require coal to get rid of SO<sub>x</sub>, NO<sub>x</sub>, and Mercury. I do not think the EPA ought to be telling us what to do about greenhouse gases because we do not have the technology to do that yet in a commercial way. But we do have in SO<sub>x</sub>, NO<sub>x</sub>, and mercury.

The Southern Company, the largest private utility, it told its investors about 3 or 4 weeks ago that it could do, it could comply with this rule in the 4 years that the rule allows, and it could do it at less of a cost than it first thought. And if 4 years is not long enough, the President is even allowed to, by Executive Order, grant 2 more years.

So, it is hard for me to see how we can object to this is the law requires it, if the court said do it, and if we have the advanced technology to do it.

Senator CARPER. Thanks very much, Senator Alexander.  
Senator Sessions.

**OPENING STATEMENT OF HON. JEFF SESSIONS,  
U.S. SENATOR FROM THE STATE OF ALABAMA**

Senator SESSIONS. Thank you, Mr. Chairman.

Mercury is a concern to me. It is something I have spent some time looking at. Around 8 years ago I requested the formation of an interagency working group on methylmercury for the Gulf of Mexico. There were a number of articles in the Mobile Press Register that dealt with the amount of mercury in the Gulf, the amount in fish, the potential threats, and I noted the importance of using honest science in dealing with the issues.

In June 2004 the Bush administration's National Science and Technology Council issued a methylmercury in the Gulf of Mexico report. So, I thought it was a good report, a valuable report, and I think it is important that we look at it because I was concerned about this fear that we had concerning mercury, and it certainly struck me as being potentially very dangerous.

But it is a false choice to say that we must have President Obama's Power Plant Mercury Rule or no rule at all. Power plant mercury emissions have already been reduced by 50 percent since 1990, and more progress is being made. In Alabama mercury emissions were reduced 27 percent from 2000 to 2010 during that 10-year period.

In 2005 the Bush administration took steps to reduce mercury emissions in our country by 70 percent. Were you there then, I guess you were, were you not, Administrator Holmstead? That would have protected human life. It reduced the emissions by about 70 percent through a market-based system and without increasing significantly energy costs. What a substantial progress that would have been.

But a court rejected certain of the trading provisions of the mercury rule and instead of correcting those errors and problems in an appropriate manner, the Obama administration has taken just about the most costly approach possible. And that is a concern to me.

Candidate Obama stated in 2008, "if someone wants to build a new coal-fired plant they can, but it will bankrupt them because they will be charged a huge sum for all the greenhouse gases that

is being emitted.” I think there is a hostility to coal, and they are using various tools and weapons to go at this source of the largest amount of our electricity in the country. It just is.

So, this rule would substantially increase electricity rates. We are having a rebound, to some degree, in manufacturing in America, I believe because of low prices of natural gas. I do not know how long that will continue, but it has been a blessing to us. Nothing has been more beneficial to manufacturing increase.

But EPA admits this will increase electricity rates by 3 percent; other data shows it could be 10 to 20 percent increases in electricity. That has a very significant impact on this economy and jobs. Anybody that denies that and makes light of a 10—3, 5, 10 percent increase in electric rates is really living in the wrong world. We live in a real world where people need work, and we need to be competitive in the world marketplace.

And I am concerned about EPA’s statistics. I will ask the witnesses a question or two. But what really happened—Ben Raines, writing in the Mobile Press Register a series of articles, really, really well written, his father is Howell Raines, former editor of the New York Times and an Alabamian, and he wrote about this very, very carefully, and I studied it. But the key event was when the CDC lowered significantly the amount of mercury that could be in a body in a healthy fashion. And it was very much disputed. But when that amount went down, then it justified the move for major rule change emissions. And then the Bush administration responded and met that challenge.

I would just note that last year the Wall Street Journal noted that with regard to mercury, power plants emit 41 to 48 tons of mercury per year in the United States. But U.S. forest fires—you have them in Wyoming, we have them sometimes—emit 44 tons a year, cremation of human remains discharges 26, Chinese power plants eject 400 tons, volcanoes, sub-sea events, geysers, and other sources spew out 9,000 to 10,000 tons per year, according to the Wall Street Journal.

So, I guess I am just saying let us get this right. Let us make our environment safer. Let us continue this substantial reduction in the amount of mercury emissions, but let us do it in a way that does not unnecessarily damage job creation and family wealth and health in America.

Thank you, Mr. Chairman.

Senator CARPER. Thank you very, very much, all of you, for your statements.

Before I introduce our witnesses, I just want to go back to something that Senator Alexander said. He mentioned that Southern, apparently in information that they provided to some of their investors, indicated that they would be able to comply with an environmental safeguard earlier, I think last month, and at about one-third less price than was originally estimated.

To go back about 20 years, when we were still trying to get serious about acid rain and trying to decide how to go about reducing the incidence of acid rain in our country, there were different approaches that were proposed, and the one that ultimately the George Herbert Walker Bush administration chose to embrace and to implement was really a cap-and-trade system involving reducing

sulfur dioxide emissions. And it turned out that by using that approach they reduced the cost by four-fifths—reduced the costs by four-fifths of what was estimated, and they actually achieved the result that was hoped for in one-half the time.

And most recently, I think in the last month when we were in a hearing here in this room with respect to air toxins, we learned that AP, a big utility in the Midwest, had indicated that they were going to be able to comply with reductions that were sought at about one-half the costs that they had originally estimated.

I think those are good things to keep in mind as we go forth.

I want Senator Merkley to share his words of wisdom as well, and then we will turn to our witnesses.

Senator Merkley, thank you.

Senator MERKLEY. Thank you, Mr. Chairman.

I am really looking forward to the wisdom of our experts. So, I will pass, and let us get to it.

Senator CARPER. You are a good man. Thank you.

All right. With that, let us welcome our witnesses.

First, our lead off hitter today is Dr. Jerome Paulson.

Dr. Paulson, it is nice to see you.

He is Chair of the American Academy of Pediatrics' Council on Environmental Health.

Next, Brenda, I want to make sure I get your name right, Archambo. Is it Archambo?

Ms. ARCHAMBO. Archambo.

Senator CARPER. Archambo. Ms. Archambo is referred to proudly by her constituents and by our Ranking Member here as the Surgeon General of Sturgeon for Tomorrow.

You know, Dr. Barrasso is a surgeon, and when I first read your bio I thought there was a typo here. I think we have a lot of doctors before us, and I thought, well, maybe you are a surgeon, maybe the Surgeon General of Michigan or something, but the Surgeon General looks even better.

Next we have Ms. Susan Dudley, Research Professor of Public Policy and Public Administration and Director of the George Washington Regulatory Studies Center.

Welcome, nice to see you.

Jeff Holmstead, welcome back. We follow you from afar and what you are up to, and we are always happy to see you. And I understand that you are now a partner at the law firm of Bracewell & Giuliani. That is great.

And finally, Dr. Charles Driscoll. Dr. Driscoll is a Professor at the Department of Civil and Environmental Engineering at Syracuse University.

Again, we ask you to try to hold your statements to about 5 minutes each. The full content of your written statements will be included in the record.

Please proceed, Dr. Paulson.

Thank you.

**STATEMENT OF JEROME A. PAULSON, M.D., FAAP, CHAIR,  
COUNCIL ON ENVIRONMENTAL HEALTH, AMERICAN ACADEMY OF PEDIATRICS**

Dr. PAULSON. Good morning.

Thank you, Chairman Carper and Ranking Member Dr. Barrasso, for the opportunity to testify today regarding the child health impacts of mercury pollution. As introduced, I am Dr. Jerome Paulson, and I am proud to represent the American Academy of Pediatrics.

It has been more than 20 years since a bipartisan Congress passed the Clean Air Act Amendments of 1990 which mandated that the EPA reduce mercury and other toxic emissions from the Nation's power plants. Since this law was enacted, we have learned much about the impact of mercury on children's health. Therefore, the American Academy of Pediatrics was tremendously pleased that the EPA has finally taken steps to reduce mercury pollution from coal- and oil-fueled power plants in the Mercury and Air Toxic Standards, or MATS, regulations released in December of last year.

This new rule will lead to cleaner air and better health for infants, children, families, and communities across the U.S. All aspects of the environment have especially profound effects on children's health. A given dose of pollutant will have a greater impact on a child than on an adult, not only due to their smaller size but because of the nature of their growing bodies and minds.

At sensitive points in child development, environmental exposures can have especially harmful effects. Methylmercury, in particular, is toxic to the developing brain of the fetus and young child. The damage it causes to an individual's health and development is permanent and irreversible.

Although a person can be exposed to mercury through breathing contaminated air or through skin contact, the most common route of exposure to methylmercury over age 1 is eating contaminated food, especially large fish. Pregnant women who consume contaminated fish transmit methylmercury to their developing fetuses, and infants can ingest methylmercury in breast milk.

Methylmercury causes localized death of nerve cells and destruction of other cells in the developing brain of an infant or fetus. It interferes with the movement of brain cells and the eventual organization of the brain. In utero exposure to low levels of mercury has been associated with subtle effects on memory, attention, and language.

Methylmercury can also damage, in adults, the kidneys, liver, brain, and nervous system. A recent study found that methylmercury exposure may even lessen the cardiovascular benefits associated with regular fish consumption among adults.

I think it is very important for everybody in this room to recognize that there is no safe level of mercury exposure or a blood mercury concentration below which adverse effects are not seen. Studies have consistently proven that reducing methylmercury improves public health outcomes and is essential to optimum child health.

The American Academy of Pediatrics recommends in the strongest terms possible that the Clean Air Act should not be weakened in any way that decreases the protection of children's health and

that this MATS regulation not be changed or weakened in any way.

In contrast to the cost of controlling pollution, which are one time or short-term expenditures, the cost to treat a child with a developmental disability resulting from methylmercury exposure re-occur every year of that child's life and in each birth cohort until mercury emissions are reduced.

If we fail to protect children against mercury pollution, we accept the cost of living with and treating preventable birth defects, chronic diseases, and disability among our Nation's infants and children. If we fail to protect children against mercury pollution, we accept the cost of permanently diminished health and productivity loss across the life span.

In conclusion, the American Academy of Pediatrics commends you, Chairman Carper and Ranking Member Dr. Barrasso, for holding this hearing today. I appreciate the opportunity to testify and will be happy to answer any questions.

[The prepared statement of Dr. Paulson follows:]

American Academy  
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DEDICATED TO THE HEALTH OF ALL CHILDREN®

Tuesday, April 17, 2012

Testimony of  
**Jerome A. Paulson, MD, FAAP**

On behalf of the  
**American Academy of Pediatrics**

**Senate Environment and Public Works Subcommittee on Clean Air and  
Nuclear Safety hearing:**

“Review of Mercury Pollution’s Impacts to Public Health and the  
Environment”

Jerome A. Paulson, MD, FAAP  
American Academy of Pediatrics  
"Review of Mercury Pollution's Impacts to  
Public Health and the Environment"  
Tuesday, April 17, 2012

Good morning. I appreciate this opportunity to testify today before the Committee on Environment and Public Works Subcommittee on Clean Air and Nuclear Safety regarding the child health impacts of mercury pollution in our environment. My name is Jerome A. Paulson, MD, FAAP, and I am proud to represent the American Academy of Pediatrics (AAP), a non-profit professional organization of more than 60,000 primary care pediatricians, pediatric medical sub-specialists, and pediatric surgical specialists dedicated to the health, safety, and well-being of infants, children, adolescents, and young adults. I am the chair of the AAP's Council on Environmental Health, and I direct the Mid-Atlantic Center for Children's Health & the Environment, one of 10 Pediatric Environmental Health Specialty Units (PEHSU), in the United States. I am also Professor of Pediatrics at the George Washington University School of Medicine and Health Sciences and Medical Director for National and Global Affairs of the Child Health Advocacy Institute at Children's National Medical Center in Washington, D.C.

It has been more than 40 years since the Congress first passed the Clean Air Act, which gave the Environmental Protection Agency (EPA) the authority to regulate air pollution. More than 20 years ago, a bipartisan Congress passed the Clean Air Act Amendments of 1990, which granted the EPA new authority and responsibility to improve air quality and mandated the agency reduce mercury and other toxic emissions from our nation's power plants. Since these laws were enacted, we have learned much about the relationship between air pollution and health through thousands of epidemiologic and controlled studies.<sup>1,2</sup> Therefore, the Academy was incredibly pleased that the EPA has finally taken these steps to improve children's health in the new Mercury and Air Toxics Standards (MATS). This new rule will lead to cleaner air for infants, children, families and communities across the United States.

The Clean Air Act has made incredible improvements in the environment, in the health of infants and children, and in the quality of life for all Americans. However, the impacts of the Clean Air Act have not been universally felt. In the last 40 years, we have learned that serious health effects of air pollutants are experienced at levels much lower than previously considered "safe" levels of exposure, particularly for vulnerable populations such as infants, children, the elderly, and individuals with respiratory diseases. In addition, air quality in many areas of the United States has improved, but in some areas it has actually decreased, and millions of Americans still live in areas where monitored air fails to meet EPA standards for at least one of six criteria pollutants. Further action and continued attention are necessary to protect the public's health against air pollution.

#### **Children Are Disproportionately Impacted By Air Pollution**

All aspects of the environment have especially profound effects on children's health. Children are disproportionately vulnerable to all environmental exposures: they breathe faster than adults, spend more time outside, and have proportionately greater skin surface exposed to the environment. A given dose of a pollutant will have a greater impact on a

Jerome A. Paulson, MD, FAAP  
American Academy of Pediatrics  
"Review of Mercury Pollution's Impacts to  
Public Health and the Environment"  
Tuesday, April 17, 2012

child than on an adult not only due to their smaller size, but because of the nature of their growing bodies and minds. At sensitive points in child development, environmental exposures can have especially harmful effects.

Infants and children are among the most susceptible to the adverse effects of air pollution and are far more vulnerable compared to adults for a number of health and developmental reasons. Ambient air pollution has been associated with several adverse birth outcomes. Air pollution has been linked to sudden infant death syndrome and mortality due to respiratory disease in normal birth weight infants,<sup>3</sup> with one study demonstrating that nearly one-quarter of deaths were attributable to elevated particulate matter.<sup>4</sup> Children are also more impacted by air pollution due to their extensive lung growth and development after birth. Eighty percent of alveoli (the part of the lungs where oxygen is absorbed and carbon dioxide is released from the blood) are formed post-natally, and the developing lung is highly susceptible to damage from environmental toxicant exposure during the early post-neonatal period.<sup>5, 6, 7</sup> Changes in the lungs continue through adolescence as respiratory cells actively proliferate and differentiate during this period of growth and development, creating increased susceptibility to the harmful effects of air pollution's chemicals and particulates.

Children are exposed to more air pollutants compared with adults because of their higher minute ventilation (the amount of air breathed in or out of the lungs per minute), higher levels of physical activity, and because they spend more time outdoors.<sup>8, 9, 10</sup> Children in communities with higher levels of urban air pollution and children who spend more time outdoors are likely to have decreased lung function and growth. This means that their lung size and function are stunted for the rest of their lives. This may make them more vulnerable to lung diseases that manifest themselves in adulthood such as chronic obstructive pulmonary disease (sometimes referred to as COPD or emphysema).<sup>11, 12</sup> The impacts of air pollution have demonstrated health consequences that impose increased health costs across the lifespan.

#### **Mercury Pollution Harms Children's Health**

Coal-fired power plants are the largest human-caused source of mercury emissions in the United States. Power plants that burn fossil fuels release mercury into the air, which then deposits in water. Bacteria in lake, stream, and ocean sediments then convert elemental mercury to organic mercury compounds (methylmercury), which then accumulates in fish moving from low concentrations in smaller fish to higher concentrations in larger fish, and are eventually consumed by humans. Although a person can be exposed to mercury through breathing contaminated air or through skin contact, the most common route of exposure to methylmercury for children over age one year is eating contaminated food, especially large predator fish. The methylmercury content of fish varies by species, size of fish, and harvest location. Large predator fish, such as mackerel king, shark, swordfish and tilefish, have the highest levels of methylmercury, compared to other commonly consumed



Jerome A. Paulson, MD, FAAP  
American Academy of Pediatrics  
"Review of Mercury Pollution's Impacts to  
Public Health and the Environment"  
Tuesday, April 17, 2012

seafood. According to the FDA's monitoring of hundreds of samples of commercial fish and shellfish, tilefish from the Gulf of Mexico have a mean mercury content of 1.5 ( $\mu\text{g}$ )/gram (g), swordfish and shark have a mean of about 1  $\mu\text{g}/\text{g}$ , and mackerel king contains about .7  $\mu\text{g}/\text{g}$ . These levels are high enough for the FDA to warn women and children against consuming these types of fish.

The health impact of mercury is one of the most extensively researched environmental health issues of our time. There is comprehensive scientific research on mercury pollution and its impacts on child health, and the findings over the past four decades have consistently proven that reducing exposure to methylmercury in the environment and mercury pollution in the air improves public health outcomes.

Methylmercury is toxic to the developing brain of the fetus and young child. The damage it causes to an individual's health and development is permanent and irreversible. The developing fetus and young children are disproportionately affected by methylmercury exposure, because many aspects of development, particularly brain maturation, can be disturbed by the presence of methylmercury. In the developing brain, methylmercury is toxic to the cerebral and cerebellar cortex, causing localized death of nerve cells and destruction of other cells in the brain. Methylmercury interferes with neuronal migration and the organization of brain cells, and layering of the cortical neurons. In utero exposure to low levels of mercury has been associated with subtle effects on memory, attention, and language.

Methylmercury can also damage the kidneys, liver, brain, and nervous system, even in adults. A recent study has also found that methylmercury exposure may lessen the cardiovascular benefits of regular fish consumption. Pregnant women who consume contaminated fish transmit methylmercury to their developing fetuses, and infants can ingest methylmercury in breast milk. There is no evidence demonstrating a "safe" level of mercury exposure, or a blood mercury concentration below which adverse effects on cognition are not seen. Minimizing mercury exposure is essential to optimal child health.

In the last 50 years, there have been two instances of high level methylmercury exposure that have helped researchers understand the impacts of methylmercury on infants and children. First, in Minamata Bay, Japan in the 1950s, a factory discharged large quantities of a mercury catalyst into the bay. As a result, there were 41 deaths and at least 30 cases of profound brain injury in infants born to mothers who ingested contaminated fish during pregnancy.<sup>13</sup> In the 1970s, grains accidentally treated with a mercury fungicide were eaten by people in Iraq during a famine, resulting in mercury poisoning in hundreds of people.<sup>14</sup> In both the Minamata Bay disaster and the Iraq epidemic, mothers who were asymptomatic or showed mild toxic effects later gave birth to severely affected infants. Typically, infants appeared normal at birth, but went on to develop serious problems such as blindness, deafness, and seizures.<sup>15</sup>

Jerome A. Paulson, MD, FAAP  
American Academy of Pediatrics  
"Review of Mercury Pollution's Impacts to  
Public Health and the Environment"  
Tuesday, April 17, 2012

In order to better understand the neurotoxic effects of low level methylmercury exposure on the developing fetus and young child, investigators have conducted a number of long-term epidemiological studies in areas around the world among populations that consume fish as significant portions of their diets. In order to assess different studies' findings, the White House convened a workshop and Congress directed the National Research Council to carry out a study of methylmercury toxicity to provide recommendations on exposure limits in 1998. In 2000, the National Research Council published the study, "*Toxicological Effects of Methylmercury*," which determined that methylmercury exposure is toxic to the developing brain. The study assessed findings from large-scale epidemiological studies in Finland, Seychelles, New Zealand and other populations to determine a reference value for methylmercury exposure and to assess the health effects of methylmercury exposure, especially neurotoxicity. The report stated that there is a large body of scientific evidence showing adverse neurodevelopmental effects of methylmercury exposure, including well-designed epidemiological studies, and therefore exposure must be minimized and avoided.

#### **Health Care Costs of Mercury Pollution**

As a pediatrician, I know that preventive health care is a fundamental investment in the health of all children and preventive health care at a young age can have lifelong impacts. Healthy children are far more likely to grow up into healthy adults. Conversely, children who experience poor health are more likely to suffer from ill health in adulthood. Inadequate attention to preventive health care mortgages the future health and welfare not only of children, but of society itself. Research across a broad range of interventions has shown that preventive health and wellness for children consistently produces a high return on investment. Preventing mercury exposure in children is an extremely effective and economical intervention for promoting lifelong health and reducing long term health costs.

Recent studies have attempted to quantify the health impacts of mercury pollution and the adverse neurodevelopmental effects of methylmercury exposure, especially loss of intelligence. One study assessed the impact on children's health of industrial mercury emissions and found that between about 300,000 and 600,000 Americans are born each year with cord blood mercury levels above 5.8 micrograms/liter,<sup>16</sup> a level associated with small but significant losses of IQ. The study estimated that these children experience mercury-related losses of cognitive function ranging from .2 to five IQ points.<sup>17</sup> This decrement in IQ is permanent and irreversible.

The study then determined that the resulting loss of intelligence causes diminished economic productivity that persists over the children's entire lifetime, in an aggregate economic cost in each annual birth cohort of \$8.7 billion.<sup>18</sup> Of this total, approximately \$1.3 billion each year is attributable to mercury emissions from American power plants. In addition, the lifetime excess cost to treat an individual with an intellectual disability is estimated between \$240,000 and \$1.2 million.<sup>19, 20</sup> Therefore, according to these studies,

Jerome A. Paulson, MD, FAAP  
American Academy of Pediatrics  
"Review of Mercury Pollution's Impacts to  
Public Health and the Environment"  
Tuesday, April 17, 2012

the cost to care for individuals experiencing intellectual disabilities as a result of mercury pollution from American coal-fired power plants is \$2 billion every year.<sup>21</sup> The loss of intelligence resulting from methylmercury consumption and mercury pollution exacts a significant cost on American society and threatens the economic health and security of the United States.

#### **Mercury and Air Toxics Standards**

The Academy was extremely pleased with the EPA's recent efforts to regulate mercury and other toxic gases from coal- and oil-fueled power plants in the new Mercury and Air Toxics Standards (MATS) regulation. These standards are long overdue and will slash emissions of mercury, arsenic, nickel, acid gases and other dangerous pollutants by relying on widely available, proven pollution controls that are already in use at more than half of the nation's coal-fired power plants. Until now, there have been no national standards that require power plants to limit their emissions of toxic air pollutants, including mercury, despite the overwhelming public health need for such reductions and readily available control technologies.

The EPA estimates that MATS will save approximately 11,000 lives, will prevent 130,000 asthma attacks, 6,300 cases of acute bronchitis, 5,000 heart attacks, 6,000 hospital visits, 540,000 missed days of work or school, and 3.2 million restricted activity days each year. MATS is a commonsense regulation that allows power plants adequate time to adopt the new technologies while also improving people's health. The EPA estimates the value of the air quality improvements for the public's health total up to \$90 billion each year. Therefore, for every one dollar spent to reduce pollution from power plants, the American public will see up to nine dollars in health benefits.

We recognize that the new rule will undoubtedly cost money, but not acting would be even more costly—not only in terms of jobs, health care costs, and education, but in human suffering and quality of life. By choosing to invest in preventing mercury exposure, the EPA has demonstrated that their priority is the health of our country and the AAP supports the agency in moving forward with this life-saving regulation.

#### **AAP Recommendations**

The AAP recommends in the strongest terms possible that the Clean Air Act should not be weakened in any way that decreases the protection of children's health. In particular, it is absolutely crucial to the health of our nation's children that the EPA is allowed to move forward with the MATS regulation and reduce mercury and other toxic emissions from coal- and oil-fueled power plants as scheduled. In contrast to the costs of controlling pollution, which are one-time or short-term expenditures, the costs to treat a child with a developmental disability resulting from mercury exposure recur in every year of that child's life and in each birth cohort until mercury emissions are reduced. The Academy

Jerome A. Paulson, MD, FAAP  
American Academy of Pediatrics  
"Review of Mercury Pollution's Impacts to  
Public Health and the Environment"  
Tuesday, April 17, 2012

encourages Congress to allow the EPA to move forward with this regulation and not impede its progress to improve our nation's health.

It is also important to note that mercury pollution does not occur alone or in isolation from other toxic emissions. Air pollutants occur in mixtures with different concentrations in different geographic areas throughout the United States. These pollutants interact with each other in the environment in different and sometimes exacerbating ways, and it is less clear how pollutants interact once they enter the human body. In order to promote optimal infant and child health and development, the Academy encourages Congress and the Administration to continue to reduce all air pollutants and address them as a whole, rather than take a piecemeal approach in regulating these serious environmental and health hazards. Further, air quality standards should be drafted or revised to ensure that the most vulnerable groups are protected. Potential effects of air pollution on the fetus, infant, and child should be evaluated and all standards should include a margin of safety for protection of children.

If we fail to protect children against air pollution, we accept the cost of living with and treating preventable birth defects, chronic diseases, and disability among our nation's infants and children. If we fail to protect children against air pollution, we also accept the cost of permanently diminished health and productivity in adults.

In conclusion, the American Academy of Pediatrics commends you, Chairman Carper and Ranking Member Barrasso, for holding this hearing today. We look forward to working with you to continue to improve air quality and children's health throughout the country. I appreciate this opportunity to testify, and I will be pleased to answer any questions you may have.

Jerome A. Paulson, MD, FAAP  
 American Academy of Pediatrics  
 "Review of Mercury Pollution's Impacts to  
 Public Health and the Environment"  
 Tuesday, April 17, 2012

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Senator CARPER. Dr. Paulson, thank you so much.

When we have, like, the Postmaster General before us or the Attorney General or the Surgeon General, we always call them General. And so, General Archambo, please proceed.

[Laughter.]

**STATEMENT OF BRENDA ARCHAMBO, PRESIDENT, STURGEON FOR TOMORROW, AND MICHIGAN OUTREACH CONSULTANT, NATIONAL WILDLIFE FEDERATION**

Ms. ARCHAMBO. Good morning, Chairman Carper, Ranking Member Barrasso, and other members of the Subcommittee. Thank you for the opportunity to speak today on behalf of Michigan's sportsmen and women, representing the great old State of Michigan.

My name is Brenda Archambo, also known as the Sturgeon General. It is not just work. It is a little bit of fun, too. I also am the Chair of our county economic development corporation, and I do outreach consulting with the National Wildlife Federation.

I am a fourth generation ice angler. I live on Black Lake in Cheboygan, Michigan. That is in northern Michigan. Black Lake is eighth largest inland lake in Michigan and is world renowned for its lake sturgeon population and the recovery efforts being conducted at Black Lake.

Michigan's wildlife and natural resources are the backbone of our \$5 billion annual recreational tourism economy, and the Great Lakes are, indeed, a national treasure. Our State's history and cultural identity are inseparably linked to our wildlife and natural resources, and that is what makes us Pure Michigan.

Across America hunters and anglers have contributed more than \$10 billion to fish and wildlife conservation and in a typical year pump \$75 billion into the economy. In Michigan there are 1.7 million hunters and anglers who spend \$3.3 billion a year. That supports 46,000 jobs.

Sportsmen and women are particularly concerned about mercury. This harmful air toxic settles from the air into our rivers, lakes, and forests, polluting the environment and accumulating up the food chain as fish and wildlife consume the contamination. This directly affects many species that are revered as our State's conservation heritage.

Few experiences in life are more precious than witnessing a child who reels in their first fish and then proudly brings it home for dinner. How do we explain to them that they cannot safely eat the fish that they catch? We should be able to eat safe fish without being worried about mercury in our bloodstream.

There are 204 fish consumption advisories in the State of Michigan. There are over 600 if you add in the other pollutants. Two hundred and four. So, all 50 States have some type of mercury fish consumption advisories.

But for over 40 years the Clean Air Act has made progress in reducing the threats posed by pollution. History has shown that we can clean up pollution, create jobs, and grow our economy all at the same time.

It is misleading to say that the enforcement of our Nation's environmental laws is bad for the economy and the unemployment. It is not. We should never have to choose between a clean environ-

ment and a job. We are entitled to both. Americans are no less entitled to a safe, clean environment during difficult economic times than in a more prosperous economy.

Reducing mercury air toxics and industrial carbon pollution will help protect our long standing investment in our outdoor heritage. We cannot return to the days when our rivers burned and smog darkened the skies and our native species were driven to the brink of extinction. We have the pollution control technology to right this wrong.

EPA's recent action to crack down on mercury pollution from power plants coupled with the proposed first ever national limits on industrial carbon pollution is a milestone in the fight to rein in a warming climate that seriously threatens people and wildlife. These actions will provide certainty to businesses and investors, spur innovation and deployment of clean technologies, and help to ignite the revitalization of our manufacturing sector.

We strongly urge Congress to support EPA's mercury and air toxics standards and the Agency's current effort to rein in carbon pollution, ensuring our outdoor legacy for future generations. Now and in the future, the EPA and other Federal and State environmental policies can help ensure that the legacy that we leave our children is a clean and healthy planet.

And I would ask if not now, when?

[The prepared statement of Ms. Archambo follows:]

**WRITTEN TESTIMONY**

**BRENDA ARCHAMBO  
PRESIDENT, STURGEON FOR TOMORROW  
MICHIGAN OUTREACH CONSULTANT, NATIONAL WILDLIFE FEDERATION**

**SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS**

**SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY**

**“REVIEW OF MERCURY POLLUTION’S IMPACTS TO PUBLIC HEALTH AND THE  
ENVIRONMENT”**

**UNITED STATES SENATE**

**APRIL 17, 2012**

Good morning Chairman Carper, Ranking Member Barrasso, and other members of the sub-committee.

Thank you for the opportunity to speak today on behalf of Michigan’s sportsmen and women representing the great ole state of Michigan. I am here in support of the EPA’s Mercury and Air Toxics Standards.

I am a fourth generation ice angler. I live on Black Lake in Cheboygan, Michigan (in the northern Lower Peninsula). Black Lake is the eighth largest Inland Lake in Michigan. Black Lake is world renowned for its lake sturgeon population, a threatened species in Michigan.

Michigan’s wildlife and natural resources are the backbone of our \$5 billion annual recreational tourism economy. The Great Lakes are a national treasure. Michigan’s wildlife is as unique as the shape of its shoreline and the variety of habitats found within its borders. Whether it is a moose in the Upper Peninsula, the iconic lake sturgeon in the Northern Lower Peninsula, or our blue-ribbon trout streams, wildlife helps define Michigan’s sense of place. Our state’s history and cultural identity are inseparably linked to our wildlife and natural resources. It is what makes us PURE MICHIGAN!

Across America hunters and anglers have contributed more than \$10 billion to fish and wildlife conservation, and in a typical year pump \$75 billion into the economy.

In Michigan:

- There are 1.7 million hunters and anglers
- Spend 3.3 billion dollars annually
- That supports 46,000 jobs

Sportsmen and women are particularly concerned about mercury. This harmful air toxic settles from the air onto our lakes, rivers, and forests, polluting the environment and accumulating up the food chain as fish and wildlife consume



the contamination. This directly affects many species, including waterfowl; walleye, bass, trout, muskie, and sturgeon...all are revered as part of our state's angling, hunting and conservation heritage.

Last December, over 14,000 Michigan hunters, anglers and conservationists joined a tele-town forum on mercury with Dr. David Evers, lead researcher on a newly published report on the extent and effects of mercury pollution in the Great Lakes region, and sportsman Bob Garner, former host of Michigan Out-of-Doors television show and chairman of the Michigan Natural Resources Trust Fund Board. Michigan conservationists participated in a discussion on the importance of the EPA's new mercury and air toxics pollution limits to Michigan's lakes and wildlife. Anglers and conservationists on the tele-town forum spoke up in support for strong air toxics protections. As Bob Garner stated, "We can't fillet our way out of mercury in fish."

This potent neurotoxin is especially harmful to children; where exposure affects a child's ability to walk, talk, read, and learn. As many as one in six women of childbearing age are likely to have mercury levels in her blood high enough to put her baby at risk.

Few experiences in life are more precious than witnessing the excitement of a child who reels in their first fish, then proudly takes it home for dinner. How do we explain to them that they cannot safely eat what they catch? Our families should be able to eat safe fish without having to worry about toxic mercury in their bloodstream.

Anglers have had to worry about mercury fish advisories for decades. There are 204 fish consumption advisories in Michigan. 204!! All 50 states have fish advisories of some type because of unsafe levels of mercury.

For over 40 years, the Clean Air Act has made progress in reducing the threats posed by pollution. History has shown we can clean up pollution, create jobs, and grow our economy all at the same time. Over the same 40 years since the Clean Air Act was passed, the GDP of the US grew by more than 200 percent.

It is misleading to say that enforcement of our nation's environmental laws is bad for the economy and employment. It isn't. We should never have to choose between a job and a healthy environment. We are entitled to both. Americans are no less entitled to a safe, clean environment during difficult economic times than they are in a more prosperous economy.

Safeguarding our natural resources is important to those of us who hunt, fish and spend time in the woods and on the waters, but it is also a wise investment in our economic future. Reducing mercury, air toxics and industrial carbon pollution will help protect our long standing investment in our outdoor heritage.

We have the pollution control technology to right this wrong. EPA's recent action to crack down on mercury pollution from power plants coupled with the proposed first-ever national limits on industrial carbon pollution is a milestone in the fight to rein in a warming climate that seriously threatens people and wildlife. These actions will provide certainty to businesses and investors, spur innovation and deployment of clean technologies, and help to ignite the revitalization of our manufacturing sector.

By utilizing our environmental laws we can help rid the air and water of these harmful pollutants and restore the health of our eco-systems. We cannot afford to return to the days when our rivers burned, smog darkened our skies, and our native species were driven to the brink of extinction.

We strongly urge Congress to support EPA's mercury and air toxics standard, and the agency's current effort to reign in carbon pollution, insuring our outdoor legacy for future generations. Now and in the future, the EPA and other federal and state environmental policies can help ensure that the legacy we leave our children is a clean and healthy planet.

If not now, when?

Senator CARPER. Ms. Archambo, thank you so much. Thanks for coming, and thank you for your testimony.

Ms. Dudley, welcome. It is very nice to see you. Please proceed.

**STATEMENT OF SUSAN DUDLEY, DIRECTOR, GEORGE WASHINGTON UNIVERSITY REGULATORY STUDIES CENTER, AND RESEARCH PROFESSOR, TRACHTENBERG SCHOOL OF PUBLIC POLICY AND PUBLIC ADMINISTRATION, GEORGE WASHINGTON UNIVERSITY**

Ms. DUDLEY. Thank you, Chairman Carper and Senator Barrasso and members of the Committee.

In announcing regulations limiting mercury and air toxic emissions from electric utilities last December, EPA said the rule will reduce mercury from coal-fired power plants by 90 percent, avoid as many as 11,000 premature deaths per year, and provide annual health benefits valued at up to \$90 billion per year. It estimated that the benefits will be 3 and 9 times the estimated compliance cost of \$9.6 billion.

To understand the basis for these remarkable benefit estimates, I reviewed EPA's regulatory impact analysis and would like to use my 5 minutes to summarize what I found.

First, reductions in exposure to mercury and air toxics, the purported target of the rule, contribute less than one ten-thousandth of these reported benefits, or between \$500,000 and \$6 million per year. These charts show you the upper and the lower bound of EPA's estimates of the benefits of the rule.

Methylmercury is a neurotoxin that can impair children's cognitive function. And as we have heard from other experts, children who consume large amounts of fresh caught fish are particularly susceptible. EPA estimates that nationwide 25,000 IQ points are lost each year from mercury exposure from all sources—natural and anthropogenic, domestic and international.

But by reducing mercury emissions from electric utilities, EPA expects to reduce that exposure by only 2 percent, resulting in a total of 511 fewer IQ points lost nationwide. That works out to an increase of .002 IQ points for the most susceptible children. And I do not think that includes the Surgeon General's child who catches a fish once every few months. These are children of subsistence fishermen; they live on eating fish.

Now, contrast this to the IQ benefits that EPA estimated from its regulations removing lead and gasoline that Senator Carper mentioned earlier. Those are predicted to have raised the average IQ of exposed children by 4 whole points, 2,000 times what EPA attributes to this rule. And those were achieved through a lead trading program at a fraction of the cost that EPA estimates here.

So, where do the benefits of the Mercury and Air Toxics Rule come from if not reductions in mercury and air toxics? The claimed \$33 billion to \$90 billion per year in economic benefits and associated 11,000 premature deaths avoided are derived by counting co-benefits that arise not directly from reducing toxic emissions but from other things the EPA predicts will happen as beneficial side effects of the controls the rule will require.

Ninety-nine percent of the benefits attributed to the mercury rule come from dollar values assigned to reductions in emissions of

fine particles, or PM, which are (a), not the focus of this regulation, and (b), regulated under other sections of the Clean Air Act. Almost all of these benefits come from reducing PM below the level EPA has already determined to be protective of public health through its National Ambient Air Quality Standards.

Eleven thousand premature deaths per year are hard to reconcile with the EPA's determination that its PM standard is "requisite to protect public health" based on "the latest scientific knowledge ... of all identifiable effects [of PM] on public health or welfare." And if these deaths were real, EPA could certainly avert them more cost effectively by lowering the Ambient Air Standards rather than going after them indirectly using statutory authority designed to reduce toxic air pollutants.

So, the bottom line is that the mercury regulation will make little progress toward reducing exposure to the toxic emissions that EPA is statutorily obligated to address. The emissions reductions from this rule will do little to reduce children's exposure to methylmercury and, according to EPA's estimate, will have an infinitesimally small effect on their IQ and welfare.

The annual cost of \$9.6 billion per year is between 1,500 and 19,000 times greater than the direct benefits that EPA estimates for the rule. And the costs will be borne by all Americans, who will pay more for electricity and anything that uses it. EPA expects the rule will increase the cost of electricity by an average of 3 percent nationwide and over 6 percent in some parts of the country.

These price increases could have a significant negative impact on the health and welfare of families, particularly low income families. By increasing the costs of heating, air conditioning, food and other goods and services that contribute to public health, the rule will divert scarce resources for much more pressing problems and activities that could contribute to improved health and economic well-being.

Thank you.

[The prepared statement of Ms. Dudley follows:]

THE GEORGE WASHINGTON UNIVERSITY  

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WASHINGTON DC  
REGULATORY STUDIES CENTER

**Prepared Statement of Susan E. Dudley**

Director, GW Regulatory Studies Center  
Research Professor,  
Trachtenberg School of Public Policy and Public Administration  
The George Washington University

Hearing on

**Review of Mercury Pollution's Impacts to  
Public Health and the Environment**

Before the

**Committee on Environment and Public Works  
Subcommittee on Clean Air and Nuclear Safety  
United States Senate**

April 17, 2012

**Prepared Statement of Susan E. Dudley**

April 17, 2012

Chairman Carper, Ranking Member Barrasso, and distinguished members of the Subcommittee, thank you for inviting me to testify today on “mercury pollution’s impacts on public health and the environment.” I am Director of the George Washington University Regulatory Studies Center, and Research Professor in the Trachtenberg School of Public Policy and Public Administration.<sup>1</sup> From April 2007 to January 2009, I oversaw executive branch regulations of the federal government as Administrator of the Office of Information and Regulatory Affairs in the Office of Management and Budget. I have devoted my career to trying to improve both the framework for developing regulations and our understanding of regulations’ effects, and for over three decades have examined regulations from perspectives in government (as both a career civil servant and political appointee), academia, consulting, and the non-profit sector.

My testimony today focuses on the Environmental Protection Agency’s (EPA) estimates of the effects of its December 2011 regulations limiting mercury and air toxics emissions from electric utilities (“MATS”).<sup>2</sup>

EPA’s fact sheet highlights the benefits of the rule as reducing emissions of heavy metals, including mercury (Hg) and acid gases, which “are known or suspected of causing cancer and other serious health effects.” It focuses on mercury emissions from power plants, noting that

“once mercury from the air reaches water, microorganisms can change it into methylmercury, a highly toxic form that builds up in fish. People are primarily exposed to mercury by eating contaminated fish. Methylmercury exposure is a particular concern for women of childbearing age, unborn babies, and young children because studies have linked high levels of methylmercury to damage to the developing nervous system, which can impair children’s ability to think and learn.”<sup>3</sup>

According to EPA’s Regulatory Impact Analysis (RIA), regulatory preamble, and fact sheets, the mandated new control technologies will reduce mercury from coal-fired power plants by 90

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<sup>1</sup> The George Washington University Regulatory Studies Center raises awareness of regulations’ effects with the goal of improving regulatory policy through research, education, and outreach. This statement reflects my views, and does not represent an official position of the GW Regulatory Studies Center or the George Washington University.

<sup>2</sup> <http://www.gpo.gov/fdsys/pkg/FR-2012-02-16/pdf/2012-806.pdf>

<sup>3</sup> EPA Fact Sheet, “Mercury and Air Toxics Standards for Power Plants,” available at: <http://www.epa.gov/mats/pdfs/20111221MATSummaryfs.pdf>

percent, avoid as many as 11,000 premature deaths per year, and have annual economic benefits of up to \$90 billion per year.<sup>4</sup>

This testimony examines those benefits.

### **Public health effects of reductions in mercury and air toxic emissions**

Methylmercury (MeHg) is a neurotoxin that can impair children's cognitive function. In its analysis supporting the regulation, EPA focused "on exposure to MeHg through ingestion of fish, as it is the primary route for human exposures in the U.S., and potential health risks do not likely result from Hg inhalation exposures associated with Hg emissions from utilities."<sup>5</sup> Relying on IQ as a measure of neurological effects, EPA developed a model that involved complex chemical, biological, and physical interactions to estimate how microbes might convert Hg emitted by electric utilities into MeHg, and how that MeHg would accumulate through different trophic levels in the food web. This allowed the agency to estimate the average mercury concentrations in fish, which it combined with estimates of the consumption of freshwater fish by pregnant women, and a modeled concentration-response relationship between mercury ingestion and IQ loss to estimate the effect of mercury ingestion on the IQ of children exposed in-utero both with and without regulation.

Based on this modeling, EPA estimates the regulation will result in an increase of .00209 points in the average IQ of exposed children, for a total of 511 IQ points nationwide.<sup>6</sup> Because children in the US are exposed to mercury from other sources (natural sources, anthropogenic sources from other countries and non-utility U.S. sources), EPA estimates they will continue to experience a decrement of 23,909 IQ points nationwide after the rule is fully implemented. The rule will have reduced the IQ decrement from mercury exposure by 3 percent. EPA assigns a dollar value ranging from \$0.5 to \$6.2 million per year to these gains.

EPA was unable to quantify or value the health benefits of the other air toxic emissions that it expects this regulation will reduce.<sup>7</sup>

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<sup>4</sup> EPA provides links to several fact sheets and technical support documents from the following web page:  
<http://www.epa.gov/mats/actions.html>

<sup>5</sup> RIA, p. 119 <http://www.epa.gov/ttn/ccas/regdata/RIAs/matsriafinal.pdf>

<sup>6</sup> EPA estimates that in 2005, children exposed to mercury (from all sources) experience a decline of 0.1068 IQ points (relative to no exposure), for a total of 25,545 IQ points nationwide. Without the regulation, EPA estimates that in 2016, exposed children will face a 0.1000 IQ point decrement for a total of 24,419 IQ points nationwide (a 4% improvement). With the regulation in 2016, the analysis predicts exposed children will experience a 0.0979 IQ point decrement, for a total of 23,909 IQ points nationwide (a 3% improvement over the no-rule scenario).

<sup>7</sup> "Due to methodology and data limitations, we did not attempt to monetize the health benefits of reductions in HAPs in this analysis." (RIA 4-72)

If these were the only benefits of EPA's MATS rule, and if one took EPA's estimates of costs and benefits at face value, then the bottom line would be that the \$9.6 billion annual cost is between 1,500 and 19,000 times greater than the benefit.

### **Co-benefits attributed to MATS**

EPA goes on to argue that its rule will generate additional "co-benefits" that more than make it worthwhile. The benefits of controlling mercury and air toxics comprise less than one ten-thousandths of the total benefits reported for the mercury and air toxics rule. The claimed \$33 to \$90 billion per year in economic benefits and 11,000 in premature deaths avoided are derived instead by counting co-benefits that arise not directly from reducing toxic emissions, but from other things EPA's models predict will happen as beneficial side effects of the controls that will be required by the rule. (See figures showing composition of reported MATS rule benefits.)

One such co-benefit is a reduction in carbon emissions, which contribute to greenhouse gases in the atmosphere, but this benefit is relatively small (between one-half and one percent of the total benefits).

Ninety-nine percent of the benefits attributed to the MATS rule are derived by assigning high dollar values to reductions in emissions of fine particles (PM<sub>2.5</sub>), which are not the focus of this regulation and which are regulated elsewhere.

Section 108 of the Clean Air Act directs the EPA Administrator to set National Ambient Air Quality Standards (NAAQS) for PM<sub>2.5</sub> at a level that is "requisite to protect the public health ... allowing an adequate margin of safety." EPA must reevaluate these NAAQS every 5 years based on "air quality criteria [that] shall accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air, in varying quantities."<sup>8</sup> The agency last set NAAQS for PM<sub>2.5</sub> in 2006, and is reevaluating those levels now.<sup>9</sup>

EPA does not suggest that the MATS rule will help states meet the PM<sub>2.5</sub> NAAQS. Other federal and state regulations are designed to do that and, as far as I can tell, EPA correctly avoids double-counting those benefits here. Rather, EPA calculates almost all of its monetary benefits for this rule from PM<sub>2.5</sub> reductions well below the levels it has already determined are "protective of public health with an adequate margin of safety, taking into consideration effects

<sup>8</sup> Clean Air Act §108(a)(2) The Supreme Court has confirmed EPA's interpretation that this statutory language precludes consideration of any impacts other than direct health effects from exposure to the pollutant.

<sup>9</sup> Information on the review is available here: [http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_2007\\_fr.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_2007_fr.html). While the spring 2010 Unified Agenda of Regulatory and Deregulatory Actions indicated a final PM<sub>2.5</sub> NAAQS rule would be issued in 2011 (<http://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201004&RIN=2060-A047>), more recent agendas have not listed a rulemaking as forthcoming.

on susceptible populations.”<sup>10,11</sup> Using a linear, no-threshold assumption and attributing effects from small reductions in PM<sub>2.5</sub> at levels that are just measurable with modern techniques, the MATS RIA models thousands of premature mortalities from exposures to PM<sub>2.5</sub> concentrations it has determined to be protective.

These large benefits are difficult to reconcile with EPA’s determination that the 2006 standard was “requisite to protect public health” based on “latest scientific knowledge... of *all* identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air, in varying quantities.” If they are legitimate, EPA should confront them directly by lowering the PM<sub>2.5</sub> NAAQS, rather than going after them indirectly using statutory authority designed to reduce toxic air pollutants. Certainly, we would expect a PM<sub>2.5</sub> standard to achieve PM<sub>2.5</sub> reductions more cost-effectively than a standard directed at some other pollutant.<sup>12</sup>

Particularly disconcerting is the assertion that the rule will provide particular benefits to children,<sup>13</sup> when over 90 percent of the reported benefits are from averted premature deaths that EPA models will accrue to people with a median age of 80 years, who would live weeks or months longer as a result of the regulations.<sup>14</sup>

In principle, a benefit-cost analysis should be “complete.” It should include all the significant consequences of a policy decision: direct and indirect, intended and unintended, beneficial and harmful. In practice, all such analyses must to some degree fall short of completeness. The problem with EPA’s co-benefits exercise in the MATS rule is that it does not approach the problem objectively. On the benefits side of the equation, EPA quantifies or lists every conceivable good thing that it might attribute to a decision to set new emission limits, while on the cost side, it only considers the most obvious direct and intended costs of complying with the regulation. Thus it dismisses risks associated with reduced electric reliability, the competitiveness of the U.S. economy in international trade, or the effect that higher electricity prices will have on the family budget. The point is not that all such things can be included in the analysis, but that the boundaries of the analysis should be set with some regard to objective science. In the case of the MATS, the search for side-effects causes the benefits to rise by a multiple of 15,000 to 66,000, while the costs rise not at all.

<sup>10</sup> The RIA states, “While benefits occurring below the standard may be less certain than those occurring above the standard, EPA considers them to be legitimate components of the total benefits estimate.” RIA, p. 23.

<sup>11</sup> [http://www.nera.com/nera-files/PUB\\_Smith\\_QualityAir\\_testimony\\_1011.pdf](http://www.nera.com/nera-files/PUB_Smith_QualityAir_testimony_1011.pdf)

<sup>12</sup> For a thorough discussion of this issue, see Anne Smith, “Technical Comments on the Regulatory Impact Analysis Supporting EPA’s Proposed Rule for Utility MACT and Revised NSPS (76 FR 24976),” available at: [http://www.nera.com/nera-files/PUB\\_Smith\\_EPA\\_report\\_0811.pdf](http://www.nera.com/nera-files/PUB_Smith_EPA_report_0811.pdf).

<sup>13</sup> See, for example, EPA’s press statements and blog: <http://blog.epa.gov/blog/2011/12/21/cutting-mercury/>

<sup>14</sup> See table 5-8 of U.S. EPA “The Benefits and Costs of the Clean Air Act, 1990-2020,” March 2011. Available at: <http://www.epa.gov/air/sect812/feb11/fullreport.pdf>. For a critique of PM benefits, see: <http://www.cmpa.com/pdf/ReassessingCleanAirAug22.pdf>.



### Improving public health and welfare

The MATS regulation will make little progress toward reducing exposure to the toxic emissions that EPA is statutorily obligated to address. EPA estimates that U.S. utilities contribute about 1 percent of all anthropogenic mercury emissions,<sup>15</sup> and the agency was unable to quantify any health or welfare effects from the other air toxics targeted by the rule.

One would also be hard pressed to claim that the MATS rule would effectively advance the goal of increasing the IQ of children exposed to methylmercury. EPA's modeling indicates that, even if it could eliminate *all* mercury emissions from U.S. electric utilities, the IQ of affected children would improve by less than .003 points. EPA estimates that under the final rule, the average IQ of exposed children will improve by just .002 points.

To put this in context, EPA estimated that its 1986 regulations removing lead from gasoline would raise the average IQ of exposed children by 4 points – a factor of 2,000 greater than the per child benefits EPA attributes to the MATS rule.<sup>16</sup>

Further, the costs of the MATS rule alone could have negative impacts on the targeted populations. EPA expects the rule will increase the costs of electricity by an average of 3 percent nationwide, and over 6 percent in some parts of the country. These price increases could have a significant negative impact on the health and welfare of families, particularly low-income families. Not only will these increases directly affect the affordability of such things as heat and air conditioning, but higher electricity prices will increase the costs of food and other goods, and divert scarce family resources from priorities such as their children's education, or health care.

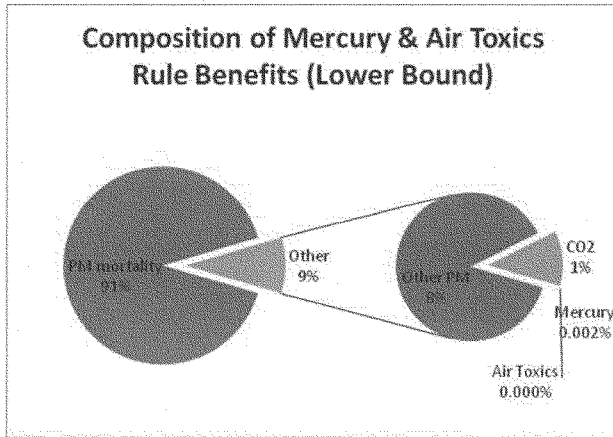
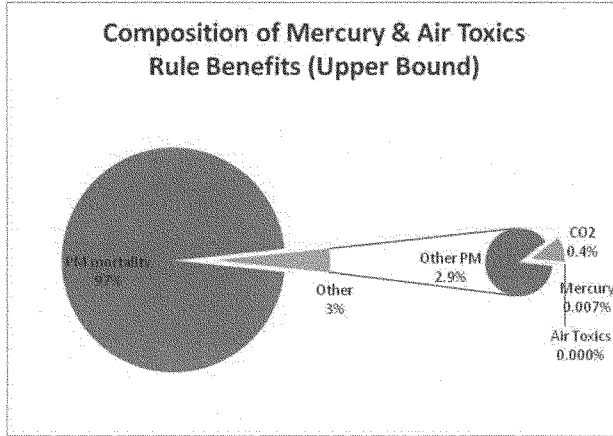
### Conclusions

The emissions reductions resulting from MATS rule will do little to reduce children's exposure to methylmercury, and according to EPA's estimates, will have an infinitesimally small effect on their IQ and welfare. On the other hand, the estimated \$9.6 billion per year in costs will be borne by all Americans, who will pay more for electricity and anything that uses it. Not only

<sup>15</sup> EPA's Risk Assessment Technical Support Document states "Current estimates of U.S. EGU mercury emissions are ~29 tons per year, compared with global anthropogenic mercury emissions, excluding biomass burning, estimated at approximately 2,320 tons. Available at: <http://www.epa.gov/airquality/powerplanttoxics/pdfs/20111216MercuryRiskAssessment.pdf>

<sup>16</sup> EPA, "Costs and Benefits of Reducing Lead in Gasoline: Final Regulatory Impact Analysis," February 1985. EPA-230-05-85-006. Available at: [http://yosemite.epa.gov/eepa/erm.nsf/vwAN/EE-0034-1.pdf/\\$file/EE-0034-1.pdf](http://yosemite.epa.gov/eepa/erm.nsf/vwAN/EE-0034-1.pdf/$file/EE-0034-1.pdf) Recent research reinforces the dramatic improvements in IQ and welfare world-wide as a result of reduced exposure to lead. See Tsai and Hatfield, "Global Benefits from the Phaseout of Leaded Fuel," *Journal of Environmental Health*; Dec2011, Vol. 74 Issue 5, p8-14, 7p

will the rule increase the cost of heating, air conditioning, food, and other goods and services that contribute to public health, but it will divert scarce resources from much more pressing problems and activities that could contribute to improved health and economic well-being.



Source: U.S. EPA Final MATS RIA Tables 4-7 and 5-19.  
<http://www.epa.gov/ttn/ccas/regdata/RIAs/matsriafinal.pdf>

Senator CARPER. Thank you. Thank you, Ms. Dudley, very much. Mr. Holmstead, please proceed. Welcome.

**STATEMENT OF JEFFREY R. HOLMSTEAD, PARTNER,  
BRACEWELL & GIULIANI LLP**

Mr. HOLMSTEAD. Thank you again for giving me the chance to appear before you today.

My name is Jeff Holmstead, and I am testifying today in my role as Counsel to the Electric Reliability Coordinating Council.

As some of you know, I have spent really all of my professional life working on Clean Air Act issues, working with Government regulators, with private companies, and with academics to develop the most effective ways to deal with different types of environmental issues. And I am very proud to say that I served as the head of EPA's Air Office for more than 4 years, from 2001 to 2005.

I would like to just start with two points that I think we all agree on. Regardless, well, first, regardless of our differences in policy, I think everyone on this panel, and I know everyone up on the dais, cares about the health of our Nation's children. And it is fundamentally dishonest for anyone to suggest that differences over policy means there is a difference in how much we care about children or about public health. Second, the question is not whether society should address mercury but rather what is the best way to do so.

I also want to comment a bit on EPA's so-called Mercury and Air Toxic Standard, which is commonly known as MATS. Like Dr. Dudley, I believe that while the goal of reducing mercury pollution is laudable, the MATS rule is unnecessarily broad and overreaching.

As Dr. Dudley mentioned, the sole legal basis for this rule is regulatory determination that then EPA Administrator Carol Browner made in December 2000 based almost entirely on her concern about mercury emission from coal-fired power plants. It might come as a surprise then that the rule itself has almost nothing to do with mercury. As Dr. Dudley and others have mentioned, virtually all the benefits that EPA claims for the rule, and the vast majority of the costs, have nothing to do with mercury.

So, this \$10 billion price tag is not really with mercury. You could achieve, even under EPA's approach, those mercury reductions at a much, much lower cost. I, like others, have concluded that this rule is much more about targeting coal-fired power plants in part because of greenhouse gas emissions than it is about regulating pollution effectively.

Although it is clear that the rule does provide some benefits to human health and environment, they are much smaller than EPA has claimed, and there are much more cost effective ways of achieving these same benefits.

Now, I have a lot I would like to say, but 5 minutes is not very much. Let me just make three points.

I think it is very really important that we do not mislead the public about mercury. I think all of us here agree that young children and especially pregnant women are especially susceptible to mercury. But is it misleading to suggest that this rule is going to make a perceptible difference in terms of reducing the mercury to

which they are exposed. And that is not my analysis. That is EPA's own analysis.

It is really important that people pay attention to what FDA and EPA and other agencies say about limiting fish consumption because even if we were to eliminate coal-fired power plants, we would have something like a .002 point IQ effect on the most susceptible children.

So, let us not mislead people into believing that somehow this rule solves the mercury problem or even makes a significant difference in it.

Second, anyone who really cares about human health, about public health, about children, should care about the cost of electricity. Look, anybody who has a child with asthma, anybody who is caring for an elderly relative knows that during times of the year the most important thing you can do is to get them into a room that has good air conditioning. If you make that air conditioning a lot more expensive, you are going to have problems.

And I look around this room, and I do not think there is anybody here that would have a problem if their electricity bill went up by 10 percent, or 15 or 25 percent. But I know people for whom that makes a big difference. And we ought not to just blithely go about accepting these generalized estimates of price increases without looking in specific parts of the country where there are a lot of coal-fired power plants. It will have a very significant impact on public health.

The last point I would like to make is there are better ways to deal with this issue. And I applaud Senator Carper. I know you have cared about this, as have Senator Alexander and Senator Inhofe. There are much more effective ways to deal with this issue.

Congressional action would be ideal. If we had followed your lead 10 years ago, we would have eliminated a lot of mercury that is out there in the environment. We would have done it in a much more cost effective way. And I am afraid this rule is also legally susceptible and that we may be back again in a few years asking about how we can deal with mercury from power plants when the real answer is to develop a cost effective way that will give a person long-term certainty and allow us to reduce our emissions.

Thank you very much.

[The prepared statement of Mr. Holmstead follows:]

**Statement of Jeffrey R. Holmstead**  
**Bracewell & Giuliani LLP**  
**Review of Mercury Pollution's Impacts to Public Health and the Environment**  
**U.S. Senate Committee on Environment & Public Works**  
**Subcommittee on Clean Air and Nuclear Safety**  
**U.S. Senate**  
**April 17, 2012**

Mr. Chairman and Members of the Subcommittee, thank you for giving me the opportunity to testify before you today. My name is Jeff Holmstead. I am testifying today as Counsel to the Electric Reliability Coordinating Council (ERCC). ERCC is a broad-based coalition of power companies that work to ensure that consumers across the United States continue to have access to reliable, affordable, and environmentally responsible power. I am also a partner in the law firm of Bracewell & Giuliani and the head of the firm's Environmental Strategies Group. I have worked on Clean Air Act issues since 1989, when I began a four-year appointment as an Associate Counsel to the President during the enactment and initial implementation of the 1990 Amendments to the Clean Air Act. I also served as the head of EPA's Air Office for more than four years, from 2001 to 2005. During the periods in which I have not worked on environmental issues in the federal government, I have worked as an environmental attorney in the private sector.

I appreciate the opportunity to testify today about the impacts of mercury on public health and the environment and the proper ways to address these harms. At the outset, it is important that we are clear about a couple of issues. *First*, irrespective of our differences in policy, everyone on this panel cares about the health and future of our nation's children, and these efforts are not advanced by having differences over policy portrayed as differences in caring about children. *Second*, the question is *not* whether society should address mercury, but rather, what is the best way to do so. While we can all agree about these general issues, there is a very real need for Congress to scrutinize how these general principles are integrated into actual policies. Currently, the focus of that effort is EPA's Mercury and Air Toxics ("MATS") rule, which was published in the Federal Register on February 16<sup>th</sup> of this year. I believe that while the goal of reducing mercury pollution is laudable, the MATS rule is unnecessarily broad and overreaching.

Although EPA's public relations campaign in support of the rule is mostly focused on mercury, the vast majority of the rule's costs come from requirements that have nothing to do with mercury. Unfortunately, the rule seems to be more about shutting down coal-fired power plants than regulating them effectively. Although the rule does provide benefits to human health and the environment, they are much smaller than EPA has claimed, and there are much more cost-effective ways of achieving these benefits.

I also feel compelled to point out that Congress had the opportunity more than a decade ago to address power plant emissions sensibly – in a way that would have been better for human health and the environment and better for anyone who has to pay an electric bill. Unfortunately, bipartisan legislative efforts that could have effectively regulated mercury and other emissions from power plants seem to have been sacrificed on the altar of climate change politics.

I understand that, just this week, 24 States filed legal challenges to EPA's MATS rule – the highest number of States ever to challenge an EPA air rule. Among these petitioners are included fully one-quarter of the nation's sitting Democratic Attorneys General. All these leaders in both parties recognize that the MATS rule will cost jobs and increase energy prices to an extent that is simply not warranted by good public policy.

#### **The MATS Rule Delivers Few Real Benefits**

The generation of sufficient, affordable and reliable electric power is a complex business. In the past, regulators and policy makers have recognized this fact and pursued a reasonably balanced approach that fairly considered both the costs and benefits associated with regulating plants that produce our nation's power. This balanced approach has resulted in substantial reductions in critical air emissions.

By 2015, coal-fueled power plants in the U.S. will have invested as much as \$125 billion in advanced emission control technologies. Success to date is clear. The U.S. electric power sector has reduced air emissions substantially under existing programs. The industry cut sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) by 57 percent between 1980 and 2008. The power sector also has cut emissions of mercury by about 40 percent through efforts to reduce other pollutants.

Electricity use increased 85 percent during this time period. While demand for electricity tripled the industry's coal use between 1970 and 2005, emissions have declined significantly and continue to decline thanks to carefully designed regulatory programs and the fact that electric companies have been able to comply with those programs – thankfully, without significantly increasing the cost of power generation.

EPA's sole basis for issuing MATS is a regulatory determination that then-EPA administrator Carol Browner made in December 2000 that it was "appropriate and necessary" to regulate certain HAPs from power plants. This determination was based almost entirely on the Administrator's concern about mercury emissions from coal-fired power plants.

The title of, and rhetoric surrounding, the MATS rule leads the public to believe that the vast majority of benefits claimed by EPA to justify the rule must be the result of reductions in mercury emissions. But EPA's cost-benefit analysis tells a very different story. According to EPA, the benefits to society of the mercury-reduction requirements are in the range of \$500,000 to a maximum of \$6.1 million in benefits. In other words, in a rule that EPA admits will cost about \$10 *billion* annually, the maximum benefit of reducing emissions of mercury—the emissions of which serve as the primary basis for the rule—is \$6.1 *million*. According to EPA, the rule is justified based on cost-benefit analysis because it will provide benefits of up to \$130 billion every year. Yet virtually all of the benefits come from reducing another pollutant known as fine particulate matter or PM2.5.

Much more troubling is that, based on EPA's own analysis, virtually all the benefits of MATS come from reducing PM2.5 concentrations in areas of the country that already meet national standards for PM2.5. In setting these standards (known as national ambient air quality standards or NAAQS), EPA says that public health in areas that meet the NAAQS is protected with an adequate margin of safety. Yet now, EPA claims that tens of thousands of people living in those areas are killed every year because of exposure to PM2.5. It is true that some advocates now argue that the annual PM2.5 NAAQS should be lowered from its current level of 15 ug per cubic meter. But more than 90 percent of the benefits that EPA claims under MATS come from areas where PM2.5 concentrations are below 12 ug.

Although mercury is the Agency's legal justification for the MATS rule, EPA argues that it must also regulate non-mercury HAPs such as certain metals (e.g. nickel, selenium, etc.) emitted in trace amounts and acid gases (e.g. hydrogen chloride and hydrogen fluoride) that, according to long-standing EPA studies, do not pose a meaningful risk to public health. While some health risks from emissions of non-mercury HAPs are discussed in the proposed rule and the RIA (presumably implying health benefits from reducing such emissions), EPA does not make any attempt to quantify the benefits that will be achieved by reducing these emissions. What is discussed at some length is that control technologies for non-mercury HAPs that companies will need to install because of the rule are expected to reduce concentrations of PM2.5. In fact, EPA's analysis admits that virtually all (i.e. 99+ percent) of the estimated \$53 to \$140 billion in annual benefits are due to reductions in PM2.5.

In the face of scores of lengthy and data-rich comments submitted to EPA, EPA's discussion of mercury in connection with the MATS rule has been very misleading. EPA dedicates thousands of words to mercury but avoids the key questions that might actually inform the public about exposure to mercury.

- How many people who are currently exposed to unsafe levels of mercury will be exposed to lower levels of mercury as a result of MATS?
- Which populations are currently consuming unsafe fish from lakes or rivers, and why have the EPA or local officials not taken action to prevent the consumption of this fish?
- In light of mercury in the environment from natural sources and industrial sources outside the U.S., will MATS make an appreciable difference in reducing mercury exposure in the U.S.?

These should not be difficult questions to answer, but EPA has chosen not to answer them. Perhaps that is why in a rule riddled with generous assumptions about health benefits, and in the face of all of the science regarding the harmful nature of mercury, the EPA can only tie .004% of the benefits under the MATS rule to mercury reductions.

#### **The Costs of MATS Are Enormous**



Although the mercury-related benefits of the MATS rule are, by EPA's own admission, very small, the costs of the rule are enormous. In fact, in terms of direct cost, it is the most expensive rule ever adopted by EPA. EPA itself estimates that the cost will be roughly \$10 billion a year, but many experts believe the actual cost will be significantly higher. These costs will be borne by the society as a whole and will largely be shared among everyone who has to pay an electric bill.

Adaptation to the MATS rule constitutes a substantial threat to the power sector – particularly given that almost half of U.S. electricity comes from coal-fired generation. The industry is concerned about the ability to retrofit environmental controls or build replacement capacity required by the MATS rule. Construction timeframes are also expected to increase due to the logistics of simultaneous installations, industry-wide competition for materials and craft labor, and increasing permitting requirements. The North American Electric Reliability Corporation (NERC) report notes that the "overlapping compliance schedules for the air and solid waste regulations, along with required compliance for rule 316(b) following shortly thereafter, may trigger a large influx of environmental construction projects at the same time that new replacement generating capacity is needed. Such a large construction increase could cause potential bottlenecks and delays in engineering, permitting and construction."<sup>1</sup>

Some studies have found that, because of EPA's new rules for the power sector, US employment income is estimated to drop by an amount equivalent to the earnings of about 2-2.5 million full-time workers. This estimate includes an estimated increase in offsetting compliance-related employment income equivalent to about 0.2-1 million full-time workers limited to the early years of implementation. Without the offsets, the estimated reduction in worker income would be 2-3.5 million. Offset employment takes into account environmental retrofitting, new power plant construction and energy efficiency improvements.

As a further frame of reference for what the overlapping regulations place at risk, consider the contribution likely to be made by the affected part of the power sector if allowed to continue and

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<sup>1</sup> NERC, *2010 Special Reliability Scenario Assessment: Resource Adequacy Impacts of Potential U.S. Environmental Regulations*, October 2010.

to innovate. Adam Rose and Dan Wei of Penn State University set out to estimate the total economic footprint of coal-fueled electric generation by 2015. They found that coal-fueled generation will contribute:

- \$1.05 trillion (2005 \$) in gross economic output;
- \$362 billion in annual household incomes, and
- 6.8 million jobs.<sup>2</sup>

Aside from direct economic impacts to industry and manufacturers, the impact of increased costs on retail and business consumers is particularly troubling. Again, using the same study referenced above and subjecting it to appropriate further analyses yield the following results:

- Retail electricity price is estimated to increase by 10 to 20% to cover the costs of complying with the new environmental requirements. Costs include installing emission control equipment, constructing new generating units, shifting more generation away from less-expensive plants to more-expensive ones and retiring existing coal units.
- The average US household is estimated to lose buying power of \$400 to \$500 per year. This reflects higher prices for energy-intensive goods, fuel shifting, and reduced household income due to both reduced employment income and reduced investment income.

Consumer energy cost impacts are likely to be regressive. Bills paid by the consumers with significant coal resources "will rapidly become the most expensive. Electric bills make up the majority of low-income household expenditures today." In a recent study on Public Opinion on Poverty, it was reported that one-quarter of Americans report having problems paying for several basic necessities. In this study, currently 23% have difficulty in paying their utilities - that is, one out of four Americans.<sup>3</sup> Further, African-American and Hispanic families will pay almost twice the amount of after-tax income on energy compared to the average and when viewed as a

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<sup>2</sup> Adam Z. Rose and Dan Wei, *The Economics of Coal Utilization and Displacement in the Continental United States, 2015* (July 2006).

<sup>3</sup> Statement of Daryl Bassett, Director, Empower Consumers, Panel on Allocation Policies to Assist and Benefit Consumers, Subcomm. on Energy and the Environment, House Comm. on Energy and Commerce, April 23, 2009.

percentage of total household income.<sup>4</sup> Likewise, elderly households use less per capita energy but still "spend a higher share of their income on energy-related expenditures."<sup>5</sup>

Certain sectors of the economy have become increasingly sensitive to minor changes in the cost of electricity. For example, the health care sector finds that almost all provisions of services are related to energy costs, with hospitals using twice as much electricity per square foot than other entities using comparable office space. One recent study found that "electricity used exclusively for medical records is rapidly increasing, by 400-800% in the past four years."<sup>6</sup>

#### **The MATS Rule May Actually Harm Public Health**

The MATS rule is likely to adversely affect public health in three ways: by increasing the cost of medical care and treatment; by imposing real threats on human health by suppressing economic growth and the improved health it brings; and by focusing on expensive rulemakings with little incremental benefits when those resources, if more sensibly deployed, could save many times more lives.

With respect to treatment costs, it is important to note that U.S. hospitals spend \$8.5 billion annually on energy, often equaling between one and three percent of a hospital's operating budget. Additionally, EPA estimates in the U.S. that the health sector is the second most energy-intensive commercial sector. The average cost of power per square foot for hospitals is approximately \$2.84. Under the EPA's power sector rules, energy costs are estimated to increase as much as 23.5% over the next decade. Hospital administrators will have no choice but to pay attention to the cost of energy as these surging energy costs will squeeze hospital budgets like never before. Without adequate power supply, built upon a foundation of stable and cost-

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<sup>4</sup> Rising energy costs disproportionately impacting minority households, Louisiana Weekly, Aug. 29, 2008, available at <http://www.louisianaweekly.com/news.php?viewStory=271>.

<sup>5</sup> Janemarie Mulvey, Impact of rising energy costs on older Americans, CRS Report for Congress No. RS22826 (Mar. 4, 2008), at [http://assets.opencrs.com/rpts/RS22826\\_20080304.pdf](http://assets.opencrs.com/rpts/RS22826_20080304.pdf).

<sup>6</sup> Dan Bednarz, Rising energy costs and the future of hospital work, Energy Bulletin, Apr. 29, 2008, available at <http://www.energybulletin.net/node/43514>.

effective coal-fired generation, the healthcare sector and the American public can expect rapidly increasing costs that consumers can ill-afford.

The economic impacts cited earlier will also directly impact public health. Placing unnecessary economic constraints on the U.S. economy, especially during a time of economic weakness, is detrimental to sound public health policy. Decades of research has shown that continuously-employed individuals experienced, on average, an additional life expectancy of four to five years due to their employment status. In contrast, additional unemployment may significantly harm public health. A report to Congress' Joint Economic Committee by Dr. Harvey Brenner showed the impacts of unemployment on public health. Brenner found that a one percent increase in the unemployment rate was associated with a two percent increase in premature deaths. In 2004, Brenner used his econometric models to estimate the public health results from reducing coal-generated electricity. For example, with a substantial reduction in coal-fired power, Brenner found the result would be between 170,000 and 300,000 premature deaths in the U.S.

Placing EPA regulations in a broader public health perspective, it is clear that the MATS rule is not among the wisest of societal investments in addressing premature mortality. President Obama himself has recognized the need to keep cost-effectiveness in mind when he ordered EPA to protect public health and the environment "while promoting economic growth, innovation, competitiveness, and job creation." Failure to allocate resources based on cost-effectiveness quite literally costs lives. Experts at the Harvard School for Public Health have estimated that expensive environmental rules literally save 100 times fewer lives than when the federal government redeployed those assets addressing higher risks. This tremendous differential in health impacts explains why EPA should not be so cavalier in its benefits analysis.

#### **What Can Be Done? The MATS Rule is Not Necessary to Control Mercury**

All too often, rules like the MATS are discussed in a vacuum with little appreciation for the history of the rulemakings or how the rule actually works. Such an effort does not advance Congressional oversight and risks misleading the public with simplistic claims that lead a lay

audience to believe that because a rule is styled as a mercury rule, it means that the rule will solve any problems with mercury.

It is important to note that the MATS rule is not necessary to regulate mercury pollution. Irrespective of the MATS rule, other power plants rules already are reducing mercury emissions substantially. Power plants must obtain and comply with state and federal permits and multiple federal and state regulations; they dedicate significant budgets to environmental compliance. Companies themselves, and the state and federal regulators who oversee them, take the current requirements seriously. As a result of these efforts, mercury emissions have long been on the decline—even without the MATS rule. The most recent report to reflect this fact was just issued on March 15 of this year by the Commission for Environmental Cooperation—a joint Commission between the governments of the US and Canada—and found that air releases of mercury and its compounds from the North American electricity generation sector fell another 26 percent between 2006 and 2009. They had already fallen about 40 percent over several years prior to that.<sup>7</sup>

If EPA wants to further regulate mercury, it does not need to use anything as sweeping as the MATS rule. In fact, even if a Congressional Review Act (CRA) petition were adopted by Congress regarding the MATS rule, it would not prevent EPA from addressing mercury emissions. While a CRA petition would send EPA back to the drawing board for five years on the specific MATS rule, EPA would be free to draft a narrower-gauge mercury rule that actually addresses the issues at hand without clouding the rule with all the extras and add-on's that have made the MATS rule the most costly rule in the history of the EPA.

The CRA says “substantially similar” rules cannot be adopted for five years after a CRA petition is adopted—but a mercury-only rule wouldn't be substantially similar. The statutory authority for regulating mercury emissions from under section 112(d) of the Clean Air Act is sufficiently broad to allow EPA to adopt a replacement rule that is substantially different from the MATS rule. The Clean Air Act provides the EPA with considerable discretion on how the Agency may subcategorize coal-fired and oil-fired power plants, as well as significant discretion regarding emissions standards for each regulated pollutant. As such, EPA could promulgate and adopt a

<sup>7</sup> <http://www.power-eng.com/articles/2012/03/report-mercury-emissions-reduced-by-26-in-recent-years.html>

replacement mercury rule that is not “substantially the same” as the MATS rule. This would allow EPA to address mercury concerns without imposing the unnecessary burdens found in the MATS rule.

It is important and necessary for Congress to continue to ensure that EPA does not implement the MATS rule until concerns about how the benefits and the costs of the rule are addressed. EPA has significant flexibility to craft a more narrowly targeted rule that avoids unnecessary costs.

Where EPA has the capacity for flexibility – such as in the control of non-mercury HAPs, sub-categorization, determination of the MACT floor, and other areas – EPA should do so, particularly in light of the high costs and weak incremental benefit analysis. The Agency has a long distance to travel from the options suggested by the current proposal.

I thank the committee for holding this hearing today and inviting me to testify, and am now happy to answer any questions you may have.

Senator CARPER. Thank you very much, Mr. Holmstead.  
Dr. Driscoll, please proceed. Thanks.

**STATEMENT OF CHARLES T. DRISCOLL, PH.D., PROFESSOR,  
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING,  
SYRACUSE UNIVERSITY**

Mr. DRISCOLL. Thank you, Senator Carper, Senator Barrasso, and members of the Subcommittee for the opportunity to speak to you about the science of mercury.

I am Charlie Driscoll, Professor of Civil and Environmental Engineering at Syracuse University. I have been studying mercury for 25 years, and I recently participated in a scientific synthesis of mercury in the Great Lakes, which I will highlight here.

In many regions of the U.S., the fresh and coastal waters that provide food, recreation, and employment to millions of people are contaminated by mercury. Most of the mercury contamination to ecosystems comes from atmospheric sources. Although mercury is a naturally occurring element, the extent of its contamination is greatly increased by human activities. For example, coal-fired electric utilities are the single largest source of mercury emissions in the United States.

Many regions of the U.S. have consistently high concentrations of mercury in fish and wildlife. As we have heard, there are fish consumption advisories for mercury for all 50 States. Indeed, there are more fish consumption advisories for mercury than all of the contaminants combined. Note that recent scientific studies have shown that controlling U.S. emissions of mercury has decreased mercury contamination in the U.S. So, there is some good news.

One of the questions that I am asked about mercury is, are U.S. emissions a major source of mercury inputs and contamination in the U.S.? The answer is yes. There are two major sources of mercury emissions, elemental mercury and oxidized mercury. Coal-fired power plants emit both. Oxidized mercury deposits close to the source while elemental mercury is capable of global long range transport. However, both forms can be deposited in the region from which they are emitted.

For example, our research shows that trees are very effective in scavenging elemental mercury out of the atmosphere, providing a pathway by which it can enter the ecosystem. In hardwood forests in the eastern U.S., up to 70 percent of the mercury that is deposited to the land occurs by this pathway. This is one of the reasons why remote areas such as in the southern Appalachians and my areas in the Adirondacks have high inputs of mercury even though they are quite remote.

These processes suggest that a substantial fraction of U.S. emissions from coal-fired power plants are deposited right here in the U.S. Once deposited on land, a key process is the transport of mercury to sediments and wetlands where it can be converted to methylmercury. The concentrations of methylmercury increase by a factor of 1 million to 10 million from water to fish. This bio-concentration is the reason why our exposure to mercury is largely as methylmercury.

A second question I am asked is, how widespread and severe are the impacts of mercury? While the emissions of mercury are often

clustered in industrialized regions, its impacts are widespread. Environmental conditions that facilitate the transport and processing of mercury are common across the eastern U.S. resulting in large areas where fish mercury concentrations exceed the .3 parts per million advisory limit.

A good example is from our investigation of the Great Lakes area where we looked into the mercury contamination across the eight Great Lake States plus the Province of Ontario, and we found that 61 percent of the land area had average game fish mercury concentrations above the .3 parts per million health threshold.

Mercury impacts go beyond human health. They also impair the health of the fishery as well as wildlife. And note that these and other environmental effects were not included in the EPA's benefits analysis for Mercury Air Toxics Rules.

Finally, I would like to address the question, will decreases in mercury emissions from coal-fired power plants decrease contamination in the U.S.? Again, the answer is yes. There is a lot of evidence of this.

Sediment records from 91 sites, lakes across the Great Lakes region, showed that mercury loading to the region from the mid-1800s to the mid-1880s increased five-fold. But over the last 25 years it has decreased 20 percent. And this is coincident with a 48 percent decrease in mercury emissions in the Great Lakes region and despite a 17 percent increase in global emissions. Consistent with these trends in mercury emissions and sediment loadings is a 25 percent decrease in mercury concentrations in wall eye and large mouth bass in the same region.

These findings demonstrate that local and regional emissions are important contributors to mercury loading in the Great Lakes area. They also show that controls on emissions within the Great Lakes region have decreased local mercury contamination, and as a result it is likely that additional emission controls from coal-fired power plants and other sources will have multiple benefits to fish and wildlife as well as the people who consume those fish.

Thank you for the opportunity to share this mercury science.

[The prepared statement of Mr. Driscoll follows:]



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**TESTIMONY TO  
THE ENVIRONMENT AND PUBLIC WORKS COMMITTEE  
SUBCOMMITTEE ON  
CLEAN AIR AND NUCLEAR SAFETY**

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17 APRIL 2012

Thank you Senator Carper, Senator Barasso and members of the Senate Environment and Public Works Committee Subcommittee on Clean Air and Nuclear Safety, for the opportunity to speak with you today about the science of mercury. My name is Charles T. Driscoll, Jr. I am a University Professor in the Department of Civil and Environmental Engineering at Syracuse University and a member of the National Academy of Engineering. I have studied the transport, fate and effects of mercury in the environment for more than 25 years, and published over 50 peer-reviewed scientific papers on the subject.

I'd like to start by pointing out that in many regions of the U.S., the fresh waters and coastal waters that provide food, recreation, and employment to millions of people have been contaminated by mercury inputs. The major source of this mercury contamination is atmospheric deposition. Mercury emissions from coal-fired electric utilities are the largest single source in the U.S. (Schmeltz et al., 2011). As a result of these long-term mercury inputs, there are hotspots and whole regions, such as the Adirondacks of New York, the Great Lakes region of the Midwest and large portions of the Southeast where the fishery is contaminated with mercury. Indeed every state in the U.S. has some sort of fish consumption advisory, and many states have blanket advisories (Schmeltz et al., 2011). There are more fish consumption advisories in the U.S. for mercury than all other contaminants combined. As a result, consumption of nutritionally important fish and the health of our nation's fish and wildlife resources are compromised by high concentrations of methyl mercury. The good news is that the science emerging from large-scale data synthesis efforts in the U.S. underscores the point that controlling U.S. sources of mercury emissions will decrease mercury contamination in the environment locally and regionally. This is what I would like to talk about today.

**1. *Are U.S. sources important to mercury deposition in the U.S.?***

Mercury is released to the environment in several ways, but the dominant pathway is airborne emissions and deposition (Fitzgerald et al., 1998; UNEP, 2003). One key to understanding the importance of U.S. sources is mercury transport (Figure 1).

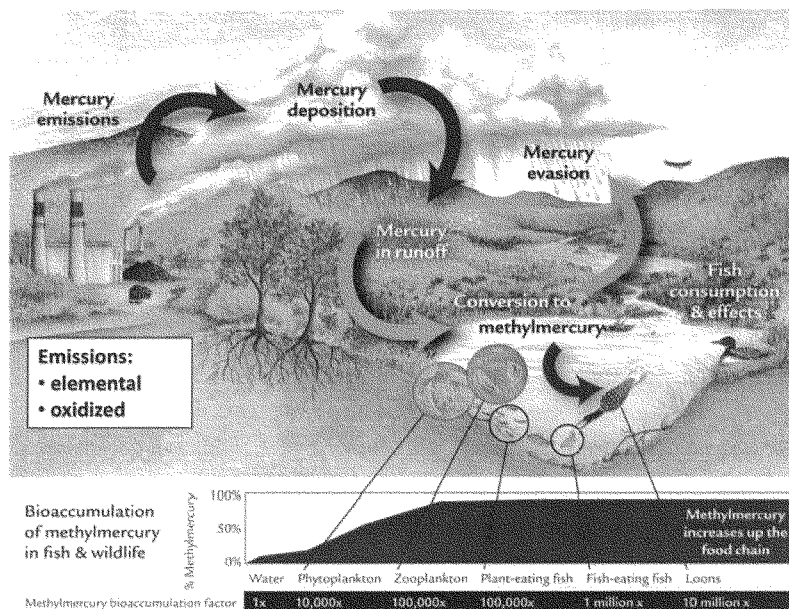


Figure 1. A simplified mercury cycle showing how mercury enters and cycles through ecosystems, biomagnifies up the food web, and bioaccumulates in fish and wildlife.

Mercury is emitted to the atmosphere in several different forms; elemental mercury, reactive gaseous mercury, and particulate mercury. The latter two forms together are known as oxidized (or ionic) mercury. Oxidized mercury is more chemically reactive and soluble in water than elemental mercury, and therefore deposits more rapidly and closer to the emission source (Keeler et al., 2006; Driscoll et al., 2007a,b,c). Elemental mercury is a relatively inert gas that does not readily dissolve in water. Therefore, it can undergo long-range transport. These distinctions between different forms of mercury become important when evaluating the relative importance of mercury emitted in the U.S. to deposition in the U.S.

While these general atmospheric transport distances have been well-researched, there are important deviations from these patterns that contribute to increased

local and regional deposition of mercury from U.S. sources. While elemental mercury does indeed have the ability to disperse globally, it may also deposit near its source or be readily converted to the oxidized forms that tend to readily deposit. For example, scientists have identified pathways for direct deposition of elemental mercury that decrease its transport distance and increase the probability of local deposition. Trees and other vegetation scavenge elemental mercury out of the atmosphere with its rough leaf surfaces, or through gas exchange in pores on the leaf surface known as stomates (Rea et al., 2002; Driscoll et al., 2007b). This pathway is one of the reasons that seemingly pristine areas like the Adirondacks and southern Appalachians receive large inputs of mercury. In forests of the Northeast and the Great Lakes region, it is estimated that up to 70% of total mercury deposition may occur through this “dry deposition” process (Miller et al., 2005; Risch et al., 2011).

Also although mercury may be emitted in the elemental form, it does not necessarily remain in that form. Elemental mercury can be converted to oxidized mercury in the atmosphere in areas where ground-level ozone is high or sea salt is prevalent (such as the coastal zone; Driscoll et al., 2007a,b). These conditions of elevated ozone and sea spray aerosols are common in the eastern U.S.

Based on what is known about how the various forms of mercury are transported or are converted in the atmosphere and the importance of dry deposition to forest lands in the Midwest and eastern U.S., it can be concluded that all forms of mercury may deposit locally or regionally. Coal-fired power plants play a particularly important role given the forms and amount of mercury they emit and their prevalence in certain regions of the U.S.

The tendency for U.S. emissions to deposit within the U.S. has been highlighted in several region-specific studies by different investigators using diverse approaches,

including the examples below.

- Han et al. (2008) conducted detailed plume modeling for southern New Hampshire and northeastern Massachusetts for the period 1996 to 2002 and determined that local emission sources are responsible for approximately 65 percent of the mercury deposited to that study area. They further estimate that nearby coal-fired power plants account for 40 percent of that locally derived mercury deposition (Han et al., 2008; Driscoll et al., 2007a).
- Keeler et al. (2006) investigated the sources of mercury in wet deposition near Steubenville, Ohio and determined that approximately 70% of the mercury was derived from coal combustion from local and regional sources.
- Bookman et al. (2008) studied long term patterns of mercury deposition to lakes in central New York and observed that these temporal patterns could largely be explained by mercury emissions from local and regional sources.
- Choi et al. (2008) conducted back-trajectory analysis from data on atmospheric concentrations of mercury species at the Huntington Forest, in the Adirondack region of New York. They found that for all three forms of mercury, elevated atmospheric concentrations appear to originate from states with high emissions of mercury, including Pennsylvania, Ohio, Indiana, Kentucky and West Virginia (Figures 2, 3 and 4). This analysis suggests that these regions are important sources of mercury to New York.

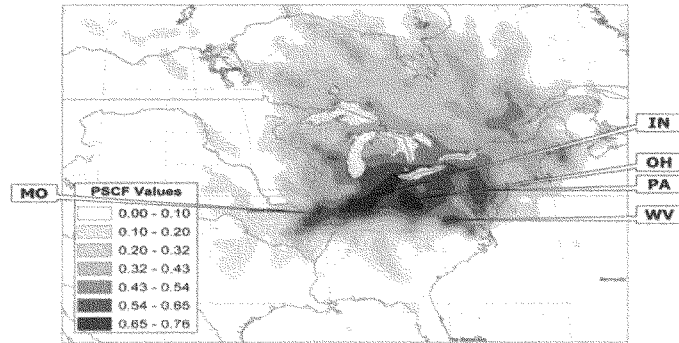


Figure 2. Sources of elemental mercury emissions to air at the Huntington Forest in the Adirondacks, based on back-trajectory analysis (after Choi et al., 2008).

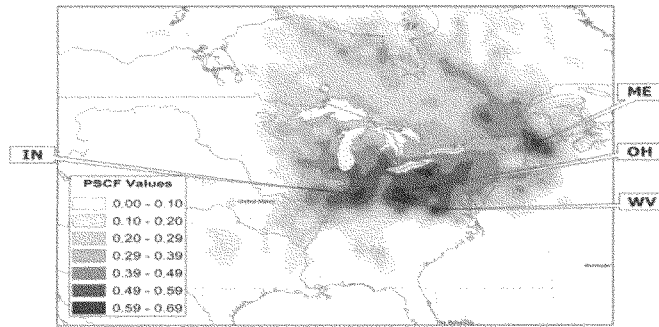


Figure 3. Sources of reactive gaseous mercury emissions to air at the Huntington Forest in the Adirondacks, based on back-trajectory analysis (after Choi et al., 2008).

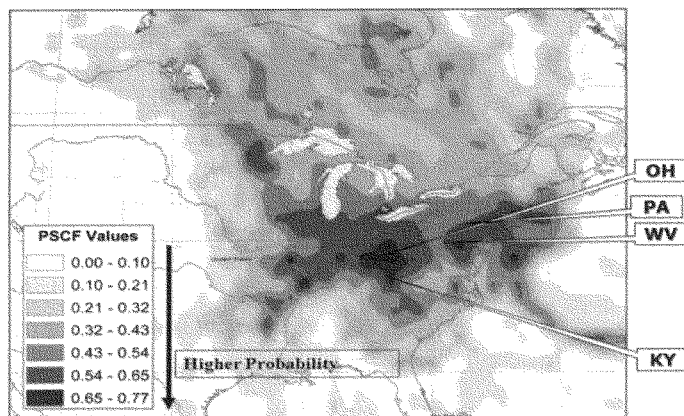


Figure 4. Sources of particulate mercury emissions to air at the Huntington Forest in the Adirondacks, based on back-trajectory analysis (after Choi et al., 2008).

## 2. How widespread and severe is the mercury issue in the U.S.?

Given the atmospheric transport of mercury and the sensitivity of large regions of the U.S. to mercury inputs, mercury is a widespread problem and the costs extend well beyond the effects on IQ quantified in the U. S. EPA benefits assessment (U.S. EPA, 2011). The deposition of mercury onto the landscape is just one step in the complex transformation of mercury from an inert element in the Earth's crust to a harmful contaminant in fish and wildlife (Figure 1). Most mercury entering the environment from atmospheric deposition occurs as ionic mercury that poses no direct health risk. However, as this relatively benign form of mercury is transported with water through the watershed, it comes into contact with bacteria that process sulfate in wetlands and lake or river sediments, and can be converted to the more bioavailable methyl mercury form by bacteria (including sulfate originating from power plant emissions; Figure 1). Sites where methylation of mercury readily occurs are wetlands and stream and lake sediments. Methyl mercury is of particular concern because methyl mercury strongly bioaccumulates through the food web.

Concentrations of methyl mercury increase by a factor of one million to 10-million from water to fish tissue (Driscoll et al., 2007a, c). Exposure to mercury largely occurs as methyl mercury.

Much of the mercury entering the environment from atmospheric deposition is retained in soil and sediments (e.g., Demers et al., 2007). This mercury represents a long-term legacy of atmospheric emissions and deposition. Some of this mercury deposited to the land surface is converted to elemental mercury and re-emitted back to the atmosphere. The extent to which mercury deposited to the land surface is ultimately transported to downstream surface waters is generally small. Note the mobilization of this legacy mercury in soil would delay the recovery of contaminated ecosystems after the implementation of controls on mercury emissions.

The sensitivity of ecosystems to atmospheric mercury deposition is reflected in their ability to transfer mercury inputs to methyl mercury and ultimately to bioaccumulate this methyl mercury in fish tissue. Conditions resulting in mercury sensitivity are common but are not uniform across the landscape, which is why it is possible to identify certain surface waters, perhaps even near power plants, where methyl mercury conditions are low and seemingly unresponsive to cuts in emissions. The characteristics that increase ecosystem sensitivity to mercury deposition include abundance of forest and wetland land cover, shallow hydrologic flowpaths, and water quality conditions that include low nutrient inputs, modest sulfate inputs and acidic conditions.

Several studies indicate a linkage between acidic deposition and mercury concentrations in fish. Atmospheric deposition of sulfate associated with sulfur dioxide emissions provides a necessary substrate for methylating bacteria (Gilmour et al., 1992). Methylating bacteria convert ionic mercury into methyl mercury, the form of mercury which bioaccumulates in fish and other wildlife.



Jeremiason et al. (2006) experimentally added sulfate to a wetland, observing increased methylation and increased export of methyl mercury. They inferred that increasing sulfur dioxide emissions and sulfate deposition would result in increases in methyl mercury in the fish of receiving waters (Jeremiason et al., 2006). Similar experiments have been conducted in Sweden and Canada (Branfireun et al., 1999; 2001). Drevnick et al. (2007) showed that decreases in fish mercury concentrations in Isle Royal were coupled with decreases in atmospheric sulfate deposition.

Hrabik and Watras (2002) used reference data and data from an experimentally acidified Little Rock Lake, Wisconsin, to examine the relative contribution of atmospheric mercury deposition and acidic deposition in regulating changes in fish mercury concentrations. They observed that decreases in fish mercury in an experimentally de-acidified basin exceeded those in the reference basin. Specifically, they found that approximately one-half of the changes in fish mercury concentrations over a six-year period could be attributed to de-acidification (Hrabik and Watras, 2002). This study suggests that acidification of lakes by acidic deposition has enhanced fish mercury concentrations and that concentrations of mercury in fish are likely to decrease with decreasing acidic deposition associated with controls on emissions from electric utilities.

Several large datasets have been synthesized in recent years to describe conditions and detect trends that demonstrate this variability in mercury sensitivity. Biological mercury hotspots have been identified in the northeastern U.S. and southeastern Canada using a dataset of biotic Hg concentrations (Evers et al., 2007). Eight layers representing three major taxa and >7,300 observations were used to locate five biological mercury hotspots and nine areas of concern (Evers et al., 2007; Driscoll et al., 2007c). The biological mercury hotspots include the western and central Adirondacks, the upper Connecticut River, the Merrimack River, the upper Androscoggin and Kennebec rivers in Maine, and southern and central Nova Scotia. Yellow perch and common loon were chosen as indicator species for human and ecological effects of mercury, respectively. Thresholds of 0.30 µg/g in yellow perch

fillets and 3.0 µg/g in common loon blood were used in the analysis. The biological mercury hotspots receive elevated atmospheric mercury deposition, have high landscape sensitivity to mercury deposition, and/or have reservoirs which experience large water-level fluctuations and enhance production of methyl mercury. These biological mercury hotspots represent distinct locations where there is a high density of independent surface waters with mercury concentrations in yellow perch above the EPA human health criterion of 0.3 parts per million (ppm) or where 25 percent or more of the common loons sampled have blood mercury concentrations above the adverse effect level of 3.0 ppm (Evers et al., 2007). The biological mercury hotspots were attributed to regional atmospheric mercury emissions combined with local sensitivity driven by the abundance of forests and wetlands and by the acidic water chemistry and associated simplified food web (Driscoll et al., 2007a).

A recent comprehensive synthesis effort in the Great Lakes region provides another useful study that depicts regional conditions (Evers et al., 2011). A screening analysis of the potential risk to human health posed by methyl mercury in fish in the Great Lakes region was conducted by comparing mercury concentrations in the fillet of six common game fish species (lake trout, largemouth bass, muskellunge, northern pike, smallmouth bass, and walleye) with specific risk categories. Mercury concentrations in 25,177 throughout the inland lakes of the Great Lakes region showed that 61 percent of the study area with sufficient data had average mercury concentrations in fillet of more than 3.0 ppm (the EPA human health criterion; Evers et al., 2011; Zananski et al., 2011; Monson et al., 2011; Figure 5). An analysis of spatial patterns in fish mercury showed that the higher fish mercury concentrations occurred in the inland lakes in the northern part of the Great Lakes region where there is high forest cover and abundant wetlands.

Note that the impacts of mercury extend beyond human health and risks from exposure through fish consumption. Recent science has demonstrated extensive effects of mercury on fish and wildlife that include decreased spawning success in

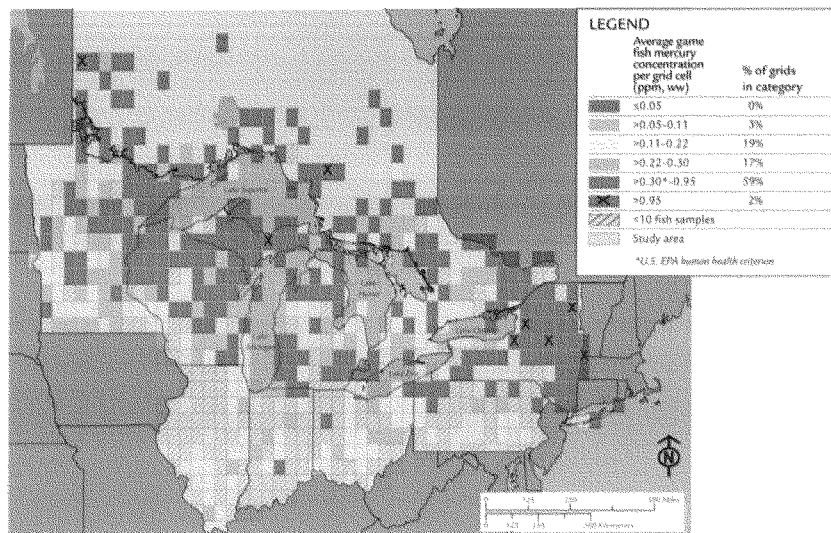


Figure 5. The mean mercury concentration in 30x30 minute grid cells for six common game fish species (lake trout, largemouth bass, muskellunge, northern pike, smallmouth bass, and walleye). Each study grid cell's color represents the mean mercury concentration of the game fish fillet samples taken from within the grid cell. A total of 25,177 fish samples were included across the region (1990-2008; data are from state and other fish monitoring programs). Grid cells with fewer than ten samples were excluded from analysis. Sixty-one percent of the study grid cells had an average mercury value in game fish fillets of more than 0.30 ppm (Evers et al. 2011 based on Zananski et al. 2011 and Monson et al. 2011).

fish (Beckvar et al., 2005; Dillon et al., 2010; Sandheinrich and Wiener, 2011) and fewer fledged young in fish-eating birds such as the common loon (Nocera and Taylor, 1998; Evers et al., 2005). The potential risk to fish from elevated methyl mercury concentrations was also evaluated in the Great Lakes region. An analysis of the commercially and recreationally important species, walleye, shows that in 53 percent of the study area, fish of reproductive size had methyl mercury concentrations above 0.2 ppm (whole body; wet weight; adapted from Sandheinrich et al., 2011; Evers et al., 2011) – the level at which adverse effects on growth,

behavior and reproduction occur (Beckvar et al., 2005; Dillon et al., 2010). These impacts to fish are particularly important for a region with a significant freshwater sport fishery that is estimated to have an economic impact across the eight Great Lakes state of \$20 billion annually (Allen and Southwick, 2008).

Birds are also affected. For example, in the Great Lakes region, Rutkiewicz et al. (2011) reported that 14 to 27 percent of the bald eagles in a Great Lakes regional study had tissue burdens at or above proposed risk threshold for birds. Scientists have shown that methyl mercury also accumulates along the terrestrial food chain. Elevated concentrations have been observed in song birds in habitats at high elevations and songbirds and bats in wetlands (Rimmer et al., 2005; Evers et al. 2012).

Note that these and other ecological effects are not included in the EPA benefits analysis for the mercury and air toxics rule. The benefits analysis did a good job for what it represented, but it did not consider effects on fish and wildlife and the environment and therefore underestimated the benefits of decreased mercury emissions.

3. **Will decreases in U.S. emissions lead to environmental improvements in the U.S.?**

Historical emissions and deposition have accumulated in soil and sediments resulting in a legacy of mercury contamination that will gradually become available and supply mercury into the environment. Nevertheless, a retrospective analysis shows that past decreases in U.S. emissions have led to beneficial improvements in the U.S. There are limited long-term data sets for methyl mercury in fish and wildlife, but lake sediments provide an important quantitative measure of how mercury inputs have changed over time. For example, the recent research from the Great Lakes region shows that as mercury emissions from sources in the Great Lakes region declined, so did mercury levels in this environment (Figure 6). A

comprehensive analysis of sediments taken from 91 inland lakes shows that mercury loading to the Great Lakes region increased about five-fold from the mid-1800s to peak values in the mid-1980s. Sediment mercury deposition has decreased about 20 percent from peak levels (Drevnick et al., 2011). These recent declines in mercury in lake sediments were concurrent with a 48 percent decrease in U.S. mercury emissions in the Great Lakes region, even as there was a 17 percent increase in global emissions (largely from Asia). The findings from this comprehensive review of mercury flux from sediments across the region have important policy implications. First, they suggest that local and regional mercury emissions are important of sources mercury to the Great Lakes region. Second, they suggest that recent controls on atmospheric emissions from sources in the Great Lakes region have been effective in decreasing the amount of mercury delivered to lakes across the region (Drevnick et al., 2011).

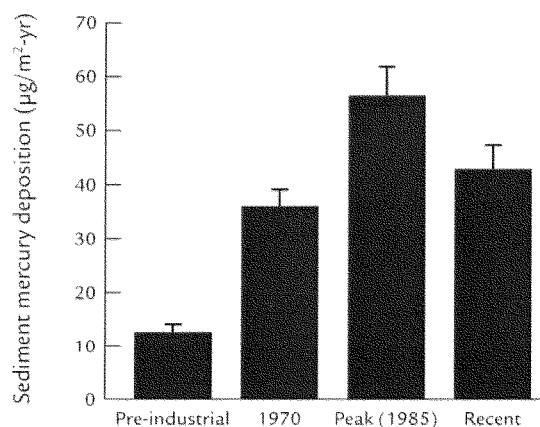


Figure 6. Atmospheric mercury that is deposited to inland lakes and accumulates in bottom sediments forms a record of historical mercury through time. Sediment cores taken from 91 inland lakes around the region indicate that the highest atmospheric mercury deposition occurred around 1985. Recent deposition of mercury is about 20 percent lower, but still three to four times greater than pre-industrial (~1850) levels.

Importantly, mercury concentrations in some fish and fish-eating birds in the region have declined from 1967 to 2009, mirroring the trends in mercury inputs and mercury in lake sediments. For example, mercury concentrations in walleye and largemouth bass from different parts of the Great Lakes region declined during this period and are now approximately 25 percent lower today than when measurements began (Monson et al., 2011; Weseloh et al., 2011; Figure 7). These data are characteristic of the regional trend of decreasing mercury concentrations in fish and wildlife in recent decades. While there may be a number of contributing factors, much of this decrease has been attributed to decreases in mercury emissions from U.S. sources in the Great Lakes region (Evers et al., 2011).

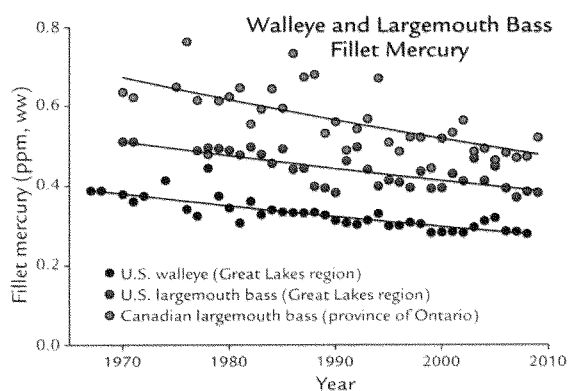


Figure 7. Temporal trends in fish fillet mercury concentrations (walleye and largemouth bass, averaged by year across multiple sites in the Great Lakes and inland water bodies in the U.S. Great Lakes states and the province of Ontario; Monson et al., 2011). These data are characteristic of the regional trend of decreasing mercury concentrations in fish and wildlife in recent decades. Much of this decrease has been attributed to reductions in regional mercury emissions, although there may be other contributing factors as well (Weseloh et al., 2011).

Thank you again for the opportunity to share some of this recent mercury science with you. I hope it is helpful to you in your deliberations.

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**EXHIBITS FOR:**

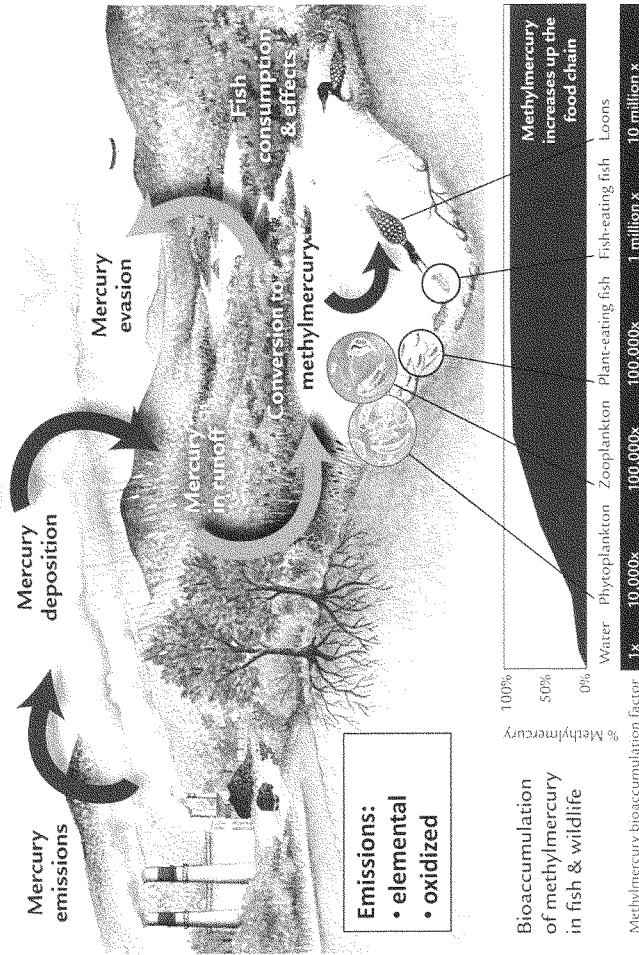
**TESTIMONY TO  
THE ENVIRONMENT AND PUBLIC WORKS COMMITTEE  
SUBCOMMITTEE ON  
CLEAN AIR AND NUCLEAR SAFETY**

**Dr. Charles T. Driscoll, NAE  
University Professor of Environmental Systems Engineering  
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17 April 2012

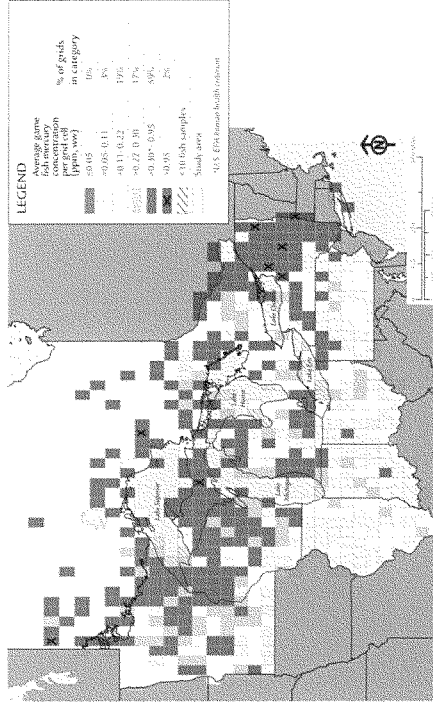
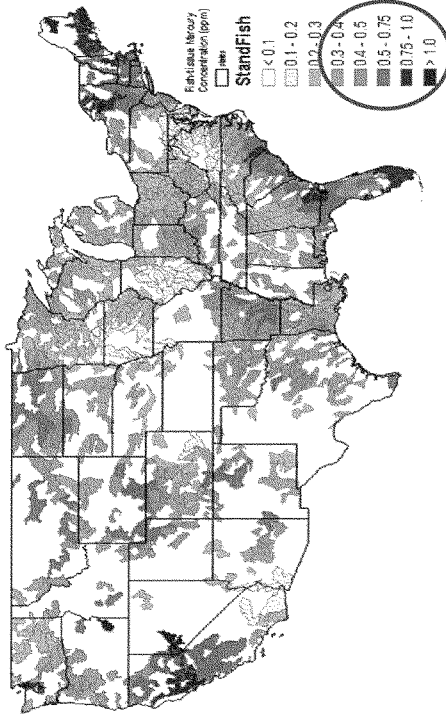
# Are U.S. mercury emissions a major source of mercury inputs to the U.S.?

## Mercury Fate



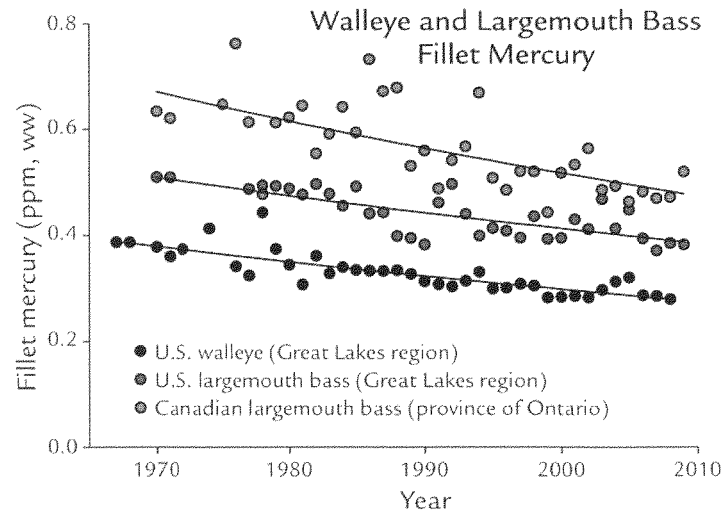
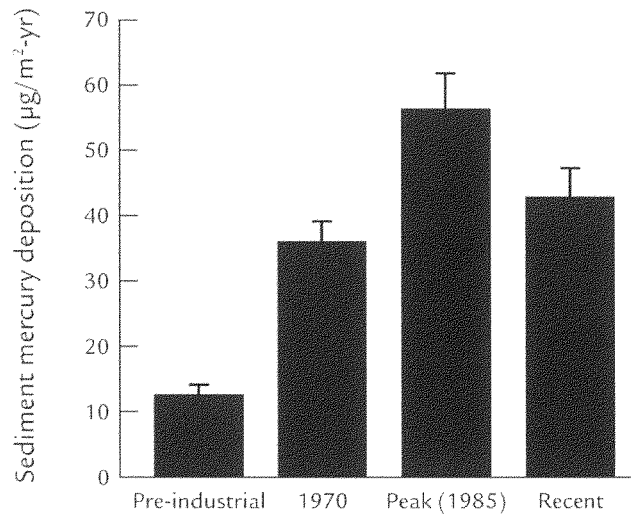
# How widespread and severe are the impacts of mercury?

## Mercury in Fish



# *Will decreases in U.S. emissions lead to environmental improvements in the U.S.?*

## Mercury Trends



Senator CARPER. Thank you. I thank you all so much.

Before I ask Dr. Paulson and Dr. Driscoll a question, I want to go back to something I think Mr. Holmstead said. I think we are going to start voting at about 11:10, so I think Senator Lautenberg is going to go to the floor and vote early and then come back and spell me so that I can get over and vote as well. So, maybe we can keep going. I hope that will work.

But Mr. Holmstead had mentioned if we had actually followed up on what we tried to do about 10 years ago, in 2002 or so, that we would be well ahead of the game. And it is unfortunate that we did not. It is unfortunate that our legislative efforts, Senator Voinovich, Senator Inhofe, Senator Alexander, and myself even 2 years ago when we tried to make progress that ultimately some folks I think in the Bakelite industry just decided that maybe they should just roll the dice and see what happens in the election and try their chances in 2011. And that is pretty much what we did.

We have ended up, instead of a legislative approach we have ended up with a regulatory approach which, frankly, I do not prefer. But having tried a legislative approach for 10 years and come up empty, eventually you say, well what is the definition of insanity? You know, asking the same question over and over again and expecting a different answer. Well, we were asking again and again.

Here is a question, if I could, for Dr. Paulson and Dr. Driscoll. In 2003 Mr. Holmstead testified, I do not think it was here but I think it was before one of the House committees, maybe it was Energy and Commerce, on behalf of then President Bush's Clear Skies Legislative Initiative which, as you will recall, sought to address mercury pollution through a cap-and-trade approach.

In his testimony, he gave estimates to the benefit—well, benefits—of the legislation, and he prefaced these benefits by saying, and I think this is quote, something to the effect that these estimates do not include the many additional benefits that cannot currently be monetized but are likely to be significant such as human health benefits from reduced risk of mercury emissions.

If somebody asked me what I said 10 hours—again I am not sure I can be positive on what I had said so I am not going to test your memory for 10 years. That is not fair. But I think that is an actual quote. And I realize that EPA under this Administration has tried to estimate some of the economic costs of not reducing mercury.

I just would ask of Dr. Paulson and Dr. Driscoll, do you feel that these estimated costs are overestimated or are underestimated, and is there still much to be learned about the true public health and environmental impacts of mercury pollution? And Dr. Paulson, why do you not lead off, and then Dr. Driscoll if you could comment as well I would appreciate it.

Dr. PAULSON. Senator Carper, thank you. I think deriving economic estimates about the impact of mercury pollution is very difficult information. It is not as crystallized as we might like it to be. I would like to refer the Committee to some papers by a colleague of mine, Leo Trisante, who currently is at NYU, and with your permission I will submit those to the record—

Senator CARPER. Without objection.



Dr. PAULSON. Dr. Trisante estimated the economic costs of methylmercury attributable to mercury specifically from power plants, and he used a methodology that Dr. Driscoll and others, Dr. Dudley and others, may be much more familiar than I, the Economically Attributable Fraction Model. He limited his analysis solely to the loss of intelligence in trying to determine the economic impact.

One of the points that he made that I think is extremely important is that the loss of IQ diminishes economic productivity that persists over a lifetime. And so we need to look at mercury and methylmercury as toxicants that have lifelong impacts. Dr. Trisante's research indicates that the lost productivity amounts to \$8.7 billion annually, and of this total \$1.3 billion each year is attributable to mercury from American power plants.

So, I think that when you start to figure annual healthcare costs and schooling costs and lost productivity from people not being able to have as good a job as adults as they otherwise would have had that the economic benefits of reducing mercury in the environment do loom larger than they might otherwise seem.

Senator CARPER. OK. Thanks so much.

Dr. Driscoll, please, the same question.

Mr. DRISCOLL. OK, beyond human health benefits we know that concentrations of mercury that we measure in fish and wildlife have clear health impacts on that fish, so it affects the fishery, and it affects the health of wildlife. So, clearly those benefits have not been considered in this analysis.

Senator CARPER. OK.

I was kidding Mr. Holmstead a minute ago about not being able to remember what I said 9 hours or 9 days or 9 months ago. I do remember, though, being in this hearing room, and I do not remember that Dr. Barrasso joined us yet in the Senate. He was back doing his work in Wyoming.

But we had a hearing here, and the question—I think it was 2003 or 2004—and the question would the utility industry be able to actually meet a reduction goal within, I do not know, 4, 5 or 6 years, of 80 percent reduction in mercury. And we had maybe four or five utilities that were here, and we had one person who was from the industry that develops technology for reducing emissions. It was like the trade association.

We had, as I recall, all the utilities said it is just not realistic to do, can they achieve an 80 percent reduction within the timeframe which was—I do not know, 5 or 6 years, I think—and we got to the guy who was from the trade association, and he said no, no, I think we could do that. In fact, we might be able to do better than 80 percent in that timeframe.

And as we all know now, we have the technology to do this. We have the technology now. And what I am hearing, anecdotally, from an earlier hearing and even today is that the cost of that technology does not appear to be going up. It actually appears to be coming down, which gives me cause for hope, and I hope for you as well.

Dr. Barrasso.

[The referenced material was not received at time of print.]

Senator BARRASSO. Thank you, Mr. Chairman.

I just want a show of hands because, Mr. Holmstead, you said irrespective of our differences in policy, everyone on this panel cares about the health and future of our Nation's children. And these efforts are not advanced by having differences over policy portrayed as differences in caring about children. Does everybody agree with that? Yes? OK, thank you.

So given that, Ms. Dudley, I think everyone in the room is concerned about children. In your written testimony you said you found it disconcerting the assertion that the rule will provide particularly benefits to children when over 90 percent, you said, of the reported benefits are from averted premature deaths that the EPA models will accrue to people with a median age of 80 years of age.

So, EPA has been going around saying that this rule is about children's health, but we have heard testimony today from the majority's witnesses who are saying that it is not about children's health. Is this a case of false advertising to concern citizens and to concern parents?

Ms. DUDLEY. Well, I would say it is misleading. And I should re-emphasize that the statistics that I presented are all directly from EPA's own analysis, including that information on who the beneficiaries are; this is not a children's health rule. Ninety-nine percent of the benefit is from PM, and that tends to accrue to older Americans. Now, that does not mean there is anything wrong with that. But we should be honest about it.

Senator BARRASSO. OK. You also talked about the EPA rule, the increased cost of electricity, and that the price increases could have a negative impact on the health and welfare of families, particularly low income families. I think Mr. Holmstead mentioned that as well. Based on your analysis about the concerns over the claims of the health benefits under the Utility MACT and given the statement about the negative health impact on families from electricity price increases, you say this rule could actually hurt public health as opposed to help it?

Ms. DUDLEY. Yes, because how much money you have to spend on things influences your health. As Mr. Holmstead mentioned, everybody in this room can afford a little more in electricity. But I think for the low income Americans, particularly the ones who are the target of this regulation, that difference is a big difference. It makes a big difference in your ability to protect your children, educate your children, and provide for their health and welfare.

Senator BARRASSO. Mr. Holmstead, you referred to EPA's effort to promote their Utility MACT rule as a "public relations campaign" and that the rule seems to be more about shutting down coal-fired power plants than regulating them effectively. Describe in more detail, if you could, what you mean by this public relations campaign, and why the EPA would need to wage a public relations campaign, and why are so many States not buying it.

Mr. HOLMSTEAD. Well, I guess my concern is really similar to Dr. Dudley's as there has been a great effort to say this is all about protecting children from air toxics and mercury, but in fact it is not. It is not only the benefits come from other things, but most of the costs. And Senator Carper is absolutely right. The technology has developed a lot. If we wanted just to reduce mercury emissions, it could be done at a tiny fraction of the cost here.

So, I guess what I object to is the idea that this is being publicly portrayed as an effort to protect children's health from mercury when in fact, according to EPA, it has very little impact on children's health, and the costs and the benefits really are quite different.

Senator BARRASSO. Ms. Dudley, you have a lot of experience in this, and I go through all your testimony. In your opinion, could the EPA do a lot better job and get us a lot more benefits at a lot lower cost to the economy than what they are proposing with this rule?

Ms. DUDLEY. Yes. I think Mr. Holmstead is better able to address this within the constraints of the Clean Air Act; he knows the Act much better. But I think, in EPA's defense, part of the problems is that the Clean Air Act does impose some constraints that restrict it from considering certain things, require it to consider other things.

So if this Committee is interested in finding ways—and I know Senator Carper has tried to do this in the past—of addressing these issues, I volunteer my Center's help as you think about ways to improve the Clean Air Act.

Senator BARRASSO. Mr. Holmstead, do you want to add anything more to that?

Mr. HOLMSTEAD. There are certainly ways within the existing Act that this could be done in a much more targeted way. If the desire here is to reduce PM<sub>2.5</sub>, there is a whole other section of the Clean Air Act that Congress designed and intended to deal with PM<sub>2.5</sub>. It is much more flexible, and you could achieve these same benefits at a much lower cost.

Senator BARRASSO. I just want to add, Mr. Chairman, there was a comment about the Southern Company and their ability to do some of these things. I think it is appropriate to say that Southern Company has assured investors that it would have a compliance strategy in place for the mercury rule, not that it supported the rule or found it to be appropriate for the consumers and for the environment.

They filed literally hundreds of pages of comments pointing out the substantial flaws in the rule, and they have actually sent us a letter that I would like to put as part of the record dated March 21st—

Senator CARPER. Without objection.

Senator BARRASSO [continuing]. That specifically states their concerns, because at our last hearing, EPA Assistant Administrator Gina McCarthy made a comment about Southern Company's compliance with the rules and said that they could comply with the rule by 2016. They have actually, they report to us that they have not said that the compliance with the MACT will be achieved by then.

Senator CARPER. OK. Without objection.

Senator BARRASSO. Thank you, Mr. Chairman.

[The referenced letter follows:]

**Southern Company Services, Inc.**  
601 Pennsylvania Avenue, NW  
Suite 600  
Washington, D.C. 20004  
Tel 202.261.5000



March 21, 2012

The Honorable Thomas R. Carper  
Hart Senate Building  
Washington, DC 20510

The Honorable John Barrasso  
Hart Senate Building  
Washington, DC 20510

Dear Senator Carper and Senator Barrasso:

At a hearing of the Clean Air and Nuclear Safety Subcommittee held on March 20, 2012, titled, "Oversight: Review of the Environmental Protection Agency's Mercury and Air Toxic Standards (MATS) for Power Plants," EPA Assistant Administrator Gina McCarthy made a comment about Southern Company's compliance with the MATS rule. In her comments, McCarthy said that Southern had announced that we could comply with the rule by 2016.

Southern Company has not said that compliance with the Utility MACT rule will be achieved by 2016. In fact, Southern does not expect to have a compliance plan finalized until later in the summer of 2012. What Southern has said is that while the capital cost for compliance with the Utility MACT rule may be somewhat less than projected from the proposed rule because the final rule may require fewer baghouses, we have NOT said that compliance will be achieved by 2016. Time beyond the 3 year compliance period will still be needed due to the need for new scrubbers, baghouses, new gas pipelines, fuel conversions and transmission projects to comply with the rule's provisions plus address potential reliability problems. Southern remains concerned about the short time frame in the rule.

Thank you for letting us correct the record on this matter. Feel free to call if you have any questions or need further information.

Sincerely,

A handwritten signature in black ink, appearing to read "L. Ray Harry". The signature is written in a cursive, somewhat stylized font.

L. Ray Harry  
Director, Environmental Affairs

cc: Senator Barbara Boxer  
Senator James M. Inhofe

Senator CARPER. Thanks.

And Senator Merkley is going to stay and ask questions. I am going to run and vote. I think Senator Lautenberg will be back, relieve him, and hopefully we will be able to keep this going.

And Jeff, I am going to run and vote. All right. So, let us just keep this going. Thanks very much. Thanks, Senator Merkley.

Senator MERKLEY [presiding]. Thank you, Mr. Chair.

I am trying to sort out some aspects of this conversation. My understanding is that largely we are talking about upgrading or replacing power plants that were grandfathered under previous regulations and now will have to be either replaced or seriously upgraded and that as multiple values, if you will, on different forms of pollution.

Is the technology—and Dr. Driscoll maybe you can try to give me a brief version of this—does the technology that addresses mercury represent the cost expressed here, or are the costs really the costs of replacing and upgrading these previously grandfathered coal burning power plants with the mercury control technology a very small portion of that?

Mr. DRISCOLL. I am not the person to answer that question.

Senator MERKLEY. Does anyone have the expertise to answer that?

Mr. Holmstead.

Mr. HOLMSTEAD. Yes. If this were only about installing mercury controls, the costs would be relatively minor for most plants. It depends a little bit on the type of coal that is used. The real cost comes not from the mercury controls but from other controls that EPA is requiring under the rule. But there is technology today much improved over where it was 7 or 8 years ago that can effectively reduce mercury, maybe not to 90 percent, depending on the coal, but it is relatively cost effective.

Senator MERKLEY. So, what we are really talking about when we look at these costs are really the overall upgrading of these previously grandfathered coal burning power plants.

Mr. HOLMSTEAD. Well, the term grandfathered is highly misleading. All of these plants are regulated under many different programs. A lot of the cost comes from shutting down plants that are minor sources of hazardous air pollution. So, typically when EPA does these regulations they only apply to major sources.

When you have a fair number of older plants that only run during peak periods that are not major sources because they do not run very often, and EPA decided to require controls on those plants, and those plants just cannot sustain, they do not operate enough to justify spending hundreds of millions of dollars on controls.

So a lot of the cost is from shutting down those plants that are really used primarily during peak seasons but are important for keeping rates down because during peak season is when the rates go the highest, and that is when these come into place.

Senator MERKLEY. We are seeing an interesting dynamic now in the energy market where a lot of less efficient power plants are being replaced by natural gas plants because of the plummeting cost of natural gas, and I do not know how that affects all of these price estimates, but it may have; it is a fairly recent influence.

I wanted to turn, Dr. Paulson, to try to understand better the anthropogenic or background sources of mercury versus the human produced versions because I have heard wildly different statistics on this. If you are kind of the typical person, if you will, somewhere in the country, is there a way to kind of sort out well how much of the mercury you experience, if you will, the wildfires that have been referred to, environmental effects such as volcanoes worldwide, Chinese coal burning versus American sources. Can you kind of sort out the sources for us in terms of percentage of impact?

Dr. PAULSON. I really cannot, but I will try to get you some information about that. I do not—you know, the molecules of mercury or the elemental mercury in the air does not come with labels. But I think what is very clear to me, and what is very important to me is that no matter where the mercury comes from, it is harmful to children. We have no control over volcanoes, extremely little control over wildfires. But we do have ways of controlling what is emitted from coal-fired power plants. And we should assume the responsibility for limiting those emissions.

Senator MERKLEY. Dr. Paulson, thank you.

Dr. Driscoll.

Mr. DRISCOLL. Yes, so I guess the simple answer is that about one-third of the mercury comes from direct human sources, about one-third is what we called recycled, recycled largely human directed sources, and then about one-third is from natural sources. A large part of the rub here, if you will, is the fact that mercury is released to the atmosphere and then cycles for hundreds of years before it is sequestered, so that is the source of the mercury that gets into vegetation and is released from biomass. It may be—has been around for hundreds of years, and so that is part of the issue that I think you are alluding to.

Senator MERKLEY. So, help me understand the difference between what you call direct human and recycled human directed.

Mr. DRISCOLL. Say that again?

Senator MERKLEY. Help me understand the distinction between the one-third that is direct human activity and the one-third that I think you referred to as recycled or human directed.

Mr. DRISCOLL. So, about one-third goes through natural sources such as volcanoes directly to the atmosphere.

Senator MERKLEY. So, we will set that one aside.

Mr. DRISCOLL. OK. So about one-third is direct human release, say from power plants and other sources, incinerators and things like that. And then another third is recycled mercury that has been previously released, deposited, and then is re-released back into the—

Senator MERKLEY. Re-released by humans? Re-released how?

Mr. DRISCOLL. Solar radiation can convert mercury to a form to go back into the atmosphere. It can be, as you said, burned with forest fires—

Senator MERKLEY. OK, so, yes, essentially two-thirds came initially from human sources, about one-third has gone through one cycle and another third of it is coming back a second time around—

Mr. DRISCOLL. Correct. Or a third time.

Senator MERKLEY. So, two-thirds from human activity. If we were to try to understand the impact or the distinction between the amount of coal and the controls in China versus the amount of mercury being generated in the U.S., do you have any sense of the ratio involved there?

Mr. DRISCOLL. There is—overwhelmingly Asian is the major source. But I should add that location is very important. Location matters. There are processes by which mercury that is emitted locally can be deposited locally. So, overwhelmingly the location of the facility where it is being emitted is very important in terms of where it is deposited.

Senator MERKLEY. Thank you.

I am going to have to check with staff here because I have to run and vote, and I am not sure if we are going to pause or we are going to adjourn.

Ms. DUDLEY. Senator, do you mind if I make a brief—

Senator MERKLEY. I am sorry; I have to be on the floor in just a few minutes, and I have got to run. But please follow up with me.

We are going to adjourn until Senator Lautenberg returns. So, I think that we are anticipating that will be just a minute or two. So, I officially declare this Subcommittee adjourned. Thank you.

[Recess.]

Senator CARPER [presiding]. I thank you all for your patience. All too infrequent things happen, the bipartisan vote in the Senate to proceed to the Postal Reform Bill.

We thank you, Senator Sessions, for your help and for other colleagues' as well.

All right. Senator Sessions, you are recognized, please. Thank you.

Senator SESSIONS. Thank you, Mr. Chairman. You do such a great job, and it is always a pleasure to work with you.

Mr. Holmstead, the Bush administration put a lot of effort into the mercury evaluation. How much would the Bush administration rule that you were there and part of developing, how much would it have reduced the emissions of mercury?

Mr. HOLMSTEAD. Ultimately, it would have reduced emissions by 70 percent. But it was very different from this rule that basically says, you know, you have got one date out in the future, and you know, you come to this cliff, and by 2016 you have to install these controls.

It was a market-based program that would have gotten the biggest emitters to reduce their emissions first. So, it would not have been 70 percent at the beginning, but it would have gotten very substantial reductions long before now. And those would have gone down gradually as opposed to what we are now talking about as you go along and you go off this cliff, and that is one of the things that is challenging about it.

Senator SESSIONS. So, had it been in effect and had been fixed immediately to satisfy the court, we would already have seen reductions in mercury emissions that we are not seeing today?

Mr. HOLMSTEAD. That is correct.

Senator SESSIONS. My understanding is that, and I have looked into this at some depth, but my impression was that much of this

was driven by a CDC, Center for Disease Control, study saying what the maximum amount of mercury that should be ingested, and they reduced the maximum amount substantially. Was that a factor in driving the new regulations at the time in the Bush administration?

Mr. HOLMSTEAD. It was—I cannot say that either it was, or it was not. I just knew that the President had made a commitment to reduce SO<sub>2</sub> and NO<sub>x</sub> and mercury through a market-based system. Now, I do remember something about that number going down a lot based—but maybe others on the panel know more about that.

Senator SESSIONS. I would just say that, that was disputed. There was not real clear science on that. And I guess the CDC was in a position where they were not looking at the costs or anything; they just simply were coming up with that.

The studies at that time evolved around epidemiology studies in the Seychelles Islands, the Pharaoh Islands in New Zealand. Is that correct, if you recall?

Mr. HOLMSTEAD. I do recall discussions about those two studies, yes.

Senator SESSIONS. Because these are heavy fishing islands, and people that ingest a very great deal of fish and with regard to, I think, the Pharaoh Islands, whale meat, blubber, which reminds me of that old saw, a guy heard that some of the travel people were eating the whale meat and blubber and you would blubber, too, if you ate whale meat.

[Laughter.]

Senator SESSIONS. I think that was a Jack Benny line or something.

[Laughter.]

Senator CARPER. That aside will not count against your time.

[Laughter.]

Senator SESSIONS. Well, we want to get this right. I guess I'm saying there, I was really intrigued by Dr. Paulson when you said there are no safe levels, but there is so much mercury naturally occurring so there is no way we can get to zero.

According to this Wall Street Journal article last year, it says that 9,000 to 10,000 additional tons are emitted from volcanoes, sub-sea vents, geysers and other sources each year, whereas the U.S. coal plants emit 41 to 48 tons of mercury a year. And we are substantially reducing that in an effective way.

According to the Wall Street Journal, since our power plants account for less than .5 percent, less than one-half of 1 percent, of all the mercury in the air we breathe, eliminating every milligram of that would do nothing about the other 99.5 percent in the atmosphere. Is that an accurate scientific thing, or do you know? And would you have a comment on that?

Dr. PAULSON. Well, Senator Sessions, I will turn more to my colleague at the far end of the table in terms of his testimony about the percentage distribution of different sources.

The point that I want to respond to relates to the health impact of mercury and our moral obligation to protect children from the mercury that we do have potential to control. And you are quite



right that we have no potential to control mercury from volcanoes or sea vents.

Senator SESSIONS. Well, I think our moral obligation, as was suggested by Dr. Barrasso, is to utilize the limited resources the United States has to get the greatest impact for public health and safety. And Dr. Driscoll, are those numbers in the realm of accurate, the 99.5 percent being other than coal-fired plant emissions and mostly natural?

Mr. DRISCOLL. I think, from my understanding, that those are very uncertain numbers. But those are much higher than numbers that I think are—the general scientific community would buy into. So, I think, you know, the estimates that I have seen are considerably lower than that. So, I would go back to what I had said previously, that the general thinking is that there has been about a three-fold increase in mercury emissions from human activities, and about a third is natural, about a third is direct human inputs, and then a third is recycled, previous emissions that have been released and then have been recycled.

Senator SESSIONS. But you acknowledge that even as our population has increased we have got a 40 percent reduction in mercury emissions from power plants.

Mr. DRISCOLL. We have done a good job, and we can see the benefits of that. We have seen reductions in mercury in fish locally as a result of those controls. So you are right. It has been a success, and I think if we did the CAMR Rule that was—we would be a lot further along today if that had been implemented. So, I would agree with Mr. Holmstead as well.

Senator SESSIONS. Well, I thank all of you.

This has been a good panel, Mr. Chairman, and a valuable panel. Mercury is dangerous; it scares people. But when the numbers and the amounts are so low, we have got to be realistic. And I do not think it can be our position that regardless of cost we will eliminate every single microgram of mercury. I just do not think that is realistic.

So, what is the best thing for America? How can we move forward and keep us in a healthy economy and make progress? I believe there are plans out there that will do it. I look forward to working with you and Members of the Committee on that.

Thank you.

Senator CARPER. Sounds great. Thank you, Senator Sessions.

Let me come back, if I could, to Dr. Paulson. I will ask you a couple of questions and then yield to Senator Lautenberg unless Senator Barrasso comes back in the meantime. I think he might. So, we will do another round of questions here.

Dr. Paulson, if I may. I want to ask you to take just a moment to respond to the assertions that were brought forward by Ms. Dudley and Mr. Holmstead that the EPA's efforts—I think I understood them to say this—that the EPA's efforts to reduce mercury and air toxics will actually hurt rather than improve public health.

Dr. PAULSON. Thank you, Senator Carper. I know with any legislation or regulation we always worry about unintended negative consequences. And if I am understanding what I am hearing here, we are worrying about unintended positive benefits of reducing

other air toxics in addition to the mercury, other toxic chemicals which damage the lungs of children and impede their health.

I think that there is no doubt that decreasing family income, disposable income, can adversely affect their health. But I think there are direct benefits from reducing the mercury as this rule would go forward, as well as significant health benefits from the reduction of the other air pollutants that would be limited by this regulation.

Senator CARPER. Do you feel comfortable in talking about some of the other air toxics that would reduce under this rule and why that might be a good thing for health for those children or adults?

Dr. PAULSON. We know that inhaled air pollutants are absorbed, in many instances are absorbed into the body, and we know that with the lungs there are sensitive periods of development, not so much in utero, that might be impacted by air pollution the way mercury can impact the brain in utero. But certainly, once children are born, the lungs continue to develop until some people say adult height is reached, so somewhere in teenage years. Some people think that the lungs continue to develop even beyond that into early adulthood.

But is very, very clear that air pollutants do adversely impact the growth of lungs such that children who grow up in a more highly polluted environment have smaller lungs in their early 20s than other children. And while they are not—the difference is not sufficient to be clinically evident, my concern is that if there are two people, one with a lower level of lung reserve than another at 20, all of us, by normal processes, lose lung reserve as we age. And so, if you have got less to begin with at 20 than somebody else, does that mean you are more likely to end up with chronic obstructive pulmonary disease—sometimes called emphysema—than somebody else?

I do not know the answer to that question that I have posed, but I certainly think there is reason to be concerned, and I certainly think that the demonstrated differences in pulmonary development are there and real.

Senator CARPER. Thank you.

Ms. Dudley, very briefly, if you will, just very brief because I want to be able to ask a question of Ms. Archambo.

Ms. DUDLEY. OK. Looking at EPA's analysis of the benefits of this rule, it is clearly not a children's health rule. The effects on children, I am looking at Table 519, they are all within the rounding error. This is a rule that all the benefits are not, are definitely not going to children.

Senator CARPER. All right.

Ms. DUDLEY. And I would be happy to submit some things for the record.

Senator CARPER. That would be great. Thank you, thank you madam.

Ms. Archambo, if I could, a question. As a Michigander, Michigander, is that how you say it? Is there a particular baseball team that you are favoring in this year's American League pennant race?

Ms. ARCHAMBO. Can I plead the fifth?

[Laughter.]

Senator CARPER. No, no, you cannot.

[Laughter.]

Senator CARPER. I am a huge, lifelong Detroit Tigers fan. If you are not, I am disappointed. We will go to someone else on the panel.

[Laughter.]

Senator CARPER. All right. You can plead the fifth.

[Laughter.]

Senator CARPER. What changes have you had to make, in your own life, with the increasing number of mercury fish advisories in your home State?

Ms. ARCHAMBO. Well, changes that I would have, or have made, is I always look at the fish consumption advisories before a group of us will go to a certain water body to fish. And there is more and more catch and release fishing now. It is what it is. But as the fish grow and age, we know that there is more contaminate loads in them, and so they should not be consumed.

But the other thing that I have been doing is trying to educate and engage, especially women and children, that as they go and fish that they should be very mindful of whether they can eat whatever species of fish that they caught, whether it is a meal once a week, or once a month, or not to eat that fish at all.

Senator CARPER. All right. Just very briefly, what has been your reaction to the recent efforts by the Federal Government to clean up mercury air pollution?

Ms. ARCHAMBO. There has been a lot of positive support in the sportsmen community for this rule because, you know, we have had to worry about mercury advisories for a long, long time, and PCBs and dioxins. And I could go on.

Last December we facilitated a sportsmen's tell a town hall and reached out to sportsmen and women across Michigan, and we were able to reach 14,000 sportsmen, hunters and anglers who definitely support this rule and are very concerned that the contamination could, in fact, be getting worse and that we need to do something now.

Also last year, the sportsmen community joined together, and about 330 sportsmen's organizations across the country representing several hundred thousand members spoke up on behalf of the Clean Air Act and the reduction of mercury for our outdoor heritage and our hunting and fishing heritage, urging our Members of Congress to please look seriously at this rule and in defense of the Clean Air Act.

Senator CARPER. OK, thanks so much.

Dr. Barrasso.

Senator LAUTENBERG. Mr. Chairman

Senator CARPER. Yes, sir.

Senator LAUTENBERG. Is there some kind of order that we are asking questions now?

Senator CARPER. No, if you would like to, go ahead. I went first, Dr. Barrasso, and then we went back to you. But if you would like to go, go ahead.

Senator LAUTENBERG. Forgive me, Dr. Barrasso.

The challenge to some of the numbers about—I think, Mr. Holmstead, you used the word perceptible differences in the emission, or maybe imperceptible, of mercury, and it sent me to think about what is perceptible? If you stand and look at one of your

grandchildren, and they are less able to keep up because of cognition problems, to keep up, is that—do you say well, he is not really that far off; it is imperceptible? I do not think so. I do not think so.

We have spent \$1.4 trillion on two wars. We have lost, 6,400 dead, 47,000 wounded. The cost is terrible. But it is a cost that we have to bear. It is a cost that we have to assume because we believe, or it is believed, that we are making ourselves safe, safer from attack from terror attacks or attacks on our people who are stationed in Afghanistan and still in Iraq.

And I do not know whether the 300,000 figure of children who are born affected each year. Is there any challenge to that figure?

Mr. HOLMSTEAD. I think, the thing that has been somewhat misleading about the discussion is that this regulation will have any appreciable effect on that number—

Senator LAUTENBERG. Appreciable. Those are the words that I love to hear—

Mr. HOLMSTEAD. Well, I mean, I think we should—

Senator LAUTENBERG. Appreciable perception. We are talking about children.

Mr. HOLMSTEAD. No, and I have children, Senator. And I also have good friends who have children who suffer from asthma, and if you are going to increase their power bill, I think you need to explain to them why you are going to do it.

Senator LAUTENBERG. I have one of them also, yes. The perceptible, the small difference. Not if it is your kids, not if it is my kids. His kids, her kids, then it is something that we have to live with. If we can spend over a trillion dollars on wars, and by the way I consented to some of those expenditures, but we did it because we genuinely believed that it would protect us in some way.

And so, when we talk about \$10 billion worth of cost, and I am told that the benefit per dollar is \$3 to \$9 in health benefit cost reduction, and so, Mr. Chairman, I think that it is very important that we put this out there, make sure that it is understood what we are talking about.

It is often said around here perfection is the enemy of the good. Well, if we do not get the precise results that we would like, but we get a lot of results that would enable our newborn to be healthier, I think we have to respond to the question what is the most important thing in life?

I came from a very successful business career, and I cut costs or made investments based on the value. And to me, the value here is one that I would have hoped, Mr. Chairman, that we would get some agreement that this is a worthwhile pursuit. And we ought to move forward with it. And let votes be counted, in Committee, or hopefully, if we get to the floor, let the votes be counted as to whether or not the damage to our newborn is sufficient enough of an alarm for us to raise the flag and say hey, we have got to do this.

I have an asthmatic grandson. I have a diabetic granddaughter. It is extra duty for two of my daughters. We love them dearly and wish my daughter did not have to take my grandson to find out where the nearest emergency clinic is when he goes to play sports.

And if she hears wheezing, she knows she has got to get him to the clinic.

I had a sister who had asthma, and she carried a little breathing device in her car and could plug it in when necessary. We traveled together so it came in handy. She was at a school board meeting in Rye, New York, where she was a member of the school board, and she felt an attack coming on. She got up, left the board to go the parking lot, collapsed in the parking lot, and died 3 days later at age 53.

So, whatever we can do to ease the burden. This is a terrible plague on our society when you think that if those numbers, 300,000, have any reliability, we owe this to the national interest as well.

Thanks, Mr. Chairman.

Senator CARPER. Thank you, Senator Lautenberg.

And I want to thank Dr. Barrasso for yielding, and you get the last questions.

Senator BARRASSO. Thank you, Mr. Chairman.

Mr. Holmstead, Senator Inhofe is not able to be here to ask his question. He is talking about using the Congressional Review Act on Utility MACT and some of the people that oppose that claim that if it were to pass, EPA would be prohibited from regulating mercury. You have a long history and knowledge in this. Could you maybe speak about that? And would the EPA still be able to regulate mercury if the Congressional Review Act were successful?

Mr. HOLMSTEAD. Oh, I think it is quite clear that they would. I have heard this argument and it is a little puzzling because it is true that the Congressional Review Act prevents—would prevent EPA from doing a rule that is substantially similar to this rule, but a rule that puts restrictions on mercury would not be substantially similar to a rule that imposes, you know, \$9 billion-plus on all kinds of other things that have nothing to do with mercury.

So, I think there is no question that even if a Congressional Review Act Resolution were to be adopted, it would not prevent EPA from doing something important to reduce mercury emissions.

Senator BARRASSO. OK. Thank you.

Ms. Archambo, Senator Lautenberg just made a comment about the enemy of good and the perfect and some of the things that I talked about a little earlier. I had mentioned in my opening statement that the Senate had an opportunity to reduce mercury emissions by 70 percent back in 2005. Would Michigan lakes, sturgeon, sportsmen, families have been better off had those reductions already gone into effect when they had an opportunity to pass that in 2005?

Ms. ARCHAMBO. Absolutely. I really think that going forward—I understand history is important, but I am looking out in front of where we do we go next, and you know, whether the rule protects children, whether the rule protects middle aged or adults, it is very important that we look going forward because to have a healthy economy we have to have healthy people and to have our tourism economy in Michigan is, you know, there is top three, manufacturing, tourism, and agriculture, and it is very much impacting our sport fishing industry, and reducing the mercury in air toxics is

going to help our history or our future in tourism and our sports fishing industry.

Senator BARRASSO. Thank you.

Ms. ARCHAMBO. So, reducing them is—no matter how we get there, we need to start now.

Senator BARRASSO. All right. It would have better off if they had done it in 2005?

Ms. ARCHAMBO. Sure.

Senator BARRASSO. Great.

Mr. Holmstead, in your written testimony, you tell us that 24 States field legal challenges to the EPA's MATS Rule, the highest number of States ever to challenge the EPA rule, and that among those petitioners are included fully a quarter of the Nation's sitting Democratic Attorneys General. Opposition to the EPA Utility MACT Rule is bipartisan and nationwide. Why do you think that is going on? What is your opinion on that?

Mr. HOLMSTEAD. Well, we really have kind of seen this divide that is much more regional than partisan. And there are parts of the country that have, that depend on coal-fired generation for affordable, reliable power, and whether you are a Democrat or whether you are a Republican, you do not want your rates to go up unnecessarily. And I know—I have seen some of the press releases from those Attorneys General, and they are concerned not only on the costs, but also the reliability issues. So, it is newsworthy, but I do not think that we have ever seen this many States challenge an EPA rule and to the point that I think you and the Chairman raised earlier, this is another legal challenge likely to set us back, and again we have not seen the briefs. Who knows? But until Congress steps in and does something sensible, we are going to be at the mercy of, you know, this trying to accomplish something that maybe the Clean Air Act was not well designed to do, and it would be better if Congress would just, you know, put us on a sustainable path that cannot be challenged in Court.

Senator BARRASSO. Ms. Dudley, anything you would like to add to that?

Ms. DUDLEY. I think that addressing mercury directly and cleanly rather than justifying it based on these benefits that really are not about children and are not about mercury would be a big improvement. Even if this regulation eliminated all mercury emissions from electric utilities, it would result in, based on EPA's analysis, only a 3 percent increase in the IQ that they are observing from mercury. Mercury is an element that cannot be created, cannot be destroyed, so we have to very aware of what this regulation will do.

Senator BARRASSO. Thank you.

Thank you, Mr. Chairman.

Senator CARPER. Thank you so much, Dr. Barrasso.

Sometimes I like to wrap up by—you know, we always ask you to give an opening statement. Sometimes, if we have time, I like to ask our entire panel to give like a, sort of a little short closing statement, almost like a benediction.

[Laughter.]

Senator CARPER. I am going to do that here today and just ask you maybe to take 30 or 45 seconds, no more than 60 seconds, just

any closing thoughts you would have for us as we prepare to go back to work.

Would you start, Doctor?

One of the things, you know, when we have a panel like this, not everybody is on the same page. We are on some of the same pages, concerned about mercury, want to make sure that we do something that is cost effective to deal with that and other air toxics, but I sometimes like to have a panel like this that can help us move toward consensus. With that in mind, if you would just fashion your benedictions with that thought in mind.

Dr. Driscoll, please.

Mr. DRISCOLL. Thank you. I would just like to reiterate what I said previously, that there have been controls on mercury emissions, and they have been successful, and they have resulted in decreases in mercury deposition and concentrations in fish. So, if we can control it, it will reduce the problem.

Senator CARPER. Thank you.

Mr. Holmstead.

Mr. HOLMSTEAD. I really have spent the last 20 some years looking at the Clean Air Act, working with economists and scientists and regulatory specialists to try to understand the most effective way to accomplish our regulatory objectives. I think all of us here agree that reducing mercury is an important objective, something that we all can collectively agree on.

I just find it puzzling that this is the choice that EPA made which imposes such substantial and unnecessary costs when there are regulatory tools even in the Clean Air Act that would allow them to do it in a much more fair and much more targeted way.

So, I, as you may have guessed, I am not a big fan of this rule. But I do think EPA has the tools it needs to do effective rule-making and to do it to divest mercury from power plants.

Senator CARPER. Thank you.

Ms. Dudley. Is it Ms. Dudley or Dr. Dudley?

Ms. DUDLEY. It is Ms. Dudley, or Professor Dudley, if you prefer.

Senator CARPER. Professor Dudley. I will get it right.

Ms. DUDLEY. See, now you have got me off track. My minute is ticking down.

[Laughter.]

Ms. DUDLEY. I think people are right to be concerned about exposure to methylmercury, and we are obviously right to care about our children's health and children's ability to grow up to be productive and fulfilled adults. But I do not think this regulation is the right way to get there. I think there are a lot more effective ways to achieve those goals.

Senator CARPER. OK. Thank you.

Ms. Archambo. General.

Ms. ARCHAMBO. Thank you, Senator. I want to thank you for the opportunity to be here today, again, from the Great Lakes State of Michigan.

Senator CARPER. How far do you live from Paw Paw?

Ms. ARCHAMBO. I live up here.

Senator CARPER. No, from Paw Paw.

Ms. ARCHAMBO. From Paw Paw? Three hours.

Senator CARPER. OK, thanks very much.

Ms. ARCHAMBO. You are very welcome.

The Clean Air Act has a long history of success in reducing pollution such as acid rain and smog that threatens our fish and wildlife and their habitats. And America's hunters and anglers, and the \$79 billion industry that supports them, and so we are glad to see long overdue action to reduce mercury pollution regardless of how we get there, regardless of what form within the Clean Air Act, regardless of what we need to do to get there, now is the time to pull together bipartisan leadership to get it done and soon.

This unique partnership formed in the 19th century continues to be at the heart of conserving wildlife, and we strongly urge you to prevent any congressional roll back of the Clean Air Act. Thank you.

Senator CARPER. Good. Thanks so much.

Dr. Paulson, last word.

Dr. PAULSON. Thanks, Senator Carper. We can have cleaner air and cleaner water and healthier citizens in the United States. And it is a false dichotomy to say that we can only have that at the expense of jobs or the economy. We can and must have both. A cleaner environment and healthier people make for a healthier economy, people who can go to work successfully and contribute to the betterment of our society. And I think that is what we all need to work to achieve. Thank you.

Senator CARPER. Thank you all. Thank you for those closing thoughts.

I will just offer a short closing thought of my own. Let me just say, in response to comments of a couple of you, this is not the first run we have made at this, this problem. Ten years ago or so some of us on this Committee sought to deal with it legislatively. Two years ago, we tried really hard to do something about it legislatively and were unsuccessful, ultimately, in the end. I think to the chagrin to some today.

We tried—Mr. Holmstead knows we tried—a regulatory approach 4 or 5 years ago, and my recollection is that it focused just on mercury. But ultimately the courts did not allow that to go forward, and they basically said, no, that is not the way to get it done, either.

Now we have this approach. And there is an old saying, and I am sure you have heard this many times, if at first you do not succeed, try, try again. Well, we have been trying. We have been trying for a long time. And the Clean Air Act says, since the last 22 years, we need to get this done. And at some point in time, we need to get this done.

It has been a good hearing. I appreciate very much the participation of our witnesses and the questions and the spirit in which this has taken place. I understand—what is it, 2 weeks? Two weeks to submit questions and materials for the record. We just ask that our witnesses respond promptly to the extent that you can to any of those questions, and they will become, your answers will become part of the hearing record, as you may know.

Again, we are just grateful to all of you for coming today and for participating. Nice to see you all. Thanks so much.

We are adjourned.

[Whereupon, at 12:18 p.m., the Subcommittee was adjourned.]



[Additional material submitted for the record follows:]

## **NRDC Acknowledges Spikes in Energy Costs for Consumers Thanks to Obama EPA Regulations**

The Natural Resources Defense Council (NRDC) wrote a letter to Senator Inhofe yesterday taking issue with a sentence included in his opening statement at a recent Environment and Public Works hearing.

What NRDC did not challenge however, was the overall point Senator Inhofe was making - in fact, in drawing attention to one particular statistic, NRDC actually admitted that energy prices will spike due to the Obama-EPA's air regulations.

As NRDC said in its letter, "MISO (Midwest Independent Transmission System Operates) has never estimated that the Mercury and Air Toxics Standards could increase electricity rates by as much as 50%. An October 2011 MISO report on the impact from four EPA regulations on the power sector, not just the Mercury and Air Toxics Standards, indicated that factoring in "all the costs to maintain regulation compliance and system reliability, retail rates could increase 7.0 to 7.6 percent."

We very much appreciate NRDC reaching out to us, because by doing so, we have the chance once again to show how much the Obama-EPA is costing American families. Even NRDC cannot deny that electricity rates *will* increase; and whether NRDC wants to admit this or not, these increased rates will hurt the poor disproportionately, acting as a regressive tax imposed by the EPA.

NRDC asked that a correction be made in the Congressional Record. We are happy to submit this piece as a clarification while pointing out the bottom line: the American people are feeling the economic pain from the Obama-EPA agenda - and under these rules, it's only going to get worse.

In fact, future capacity prices, a significant component of future electricity rates, increased in the May 2011 PJM auction by 350% in the western region of PJM (an area covering parts of Pennsylvania, Maryland, New Jersey, Delaware, Virginia, West Virginia, Ohio, North Carolina, Tennessee, Indiana, Michigan and Illinois.). PJM attributes the majority of this increase to the "installation of emission control technologies that are required to meet increasingly stringent environmental regulations."

In explaining the effect of these capacity price increases, the Chicago Tribune reports that a four-fold increase in capacity prices translates into annual electricity price increases between \$107 to \$178 for ComEd customers (one of the utilities in the western region of PJM). But this is just the beginning. At this May's annual auction (we anticipate the results to be released within the next few weeks), future capacity prices in northern Ohio could go as high as \$500/MW-day (according to Deutsche Bank). This represents a change in 2 years of 1,700%.

And what does this mean for Americans? Manufacturers are the backbone of the US economy and affordable electricity is essential to their ability to grow and prosper. As an example of how electricity costs can affect a company's bottom line, according to Nucor Steel, one of the largest steel producers in the US, a 1 cent increase in the price of electricity results in cost increases of

\$120 million annually. So even small increases in electricity costs mean lost jobs and productive capacity.

According to the National Economic Research Associates, EPA's rules will cost the economy 1.65 million jobs by 2020. This is echoed by the Maguire Energy Institute at Southern Methodist University, which concludes EPA's rules are threatening up to 1 million jobs in addition to the job losses that could occur in the coal and utility sector. These are the real outcomes of the Obama EPA's policies.

NRDC is a well known enemy of coal and an avid supporter of President Obama's war on affordable energy. This agenda is not about saving lives or improving the environment. It's a calculated effort to kill coal in American electrical generation - and as NRDC and the President know all too well, in order to achieve that goal, electricity prices will have to "necessarily skyrocket." We're just glad that NRDC is willing to admit that.