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LIGHTS OUT: HOW EPA REGULATIONS THREATEN AFFORDABLE POWER AND JOB CREATION

HEARING

BEFORE THE

SUBCOMMITTEE ON REGULATORY AFFAIRS, STIMULUS OVERSIGHT AND GOVERNMENT SPENDING

OF THE

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HOUSE OF REPRESENTATIVES

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LIGHTS OUT: HOW EPA REGULATIONS THREATEN AFFORDABLE POWER AND JOB CREATION

TUESDAY, JULY 26, 2011

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON REGULATORY AFFAIRS, STIMULUS
OVERSIGHT AND GOVERNMENT SPENDING,
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 3:20 p.m., in room 2154, Rayburn House Office Building, Hon. Jim Jordan (chairman of the subcommittee) presiding.

Present: Representatives Jordan, Buerkle, Labrador, and Kucinich.

Staff present: Ali Ahmad, communications advisor; Michael R. Bebeau, assistant clerk; Joseph A. Brazauskas, counsel; Drew Colliatie, staff assistant; Adam P. Fromm, director of Member services and committee operations; Linda Good, chief clerk; Ryan M. Hambleton, professional staff member; Christopher Hixon, deputy chief counsel, oversight; Mark D. Marin, senior professional staff member; Kristina M. Moore, senior counsel; Michael Whatley, professional staff member; Ronald Allen, minority staff assistant; Claire Coleman, minority counsel; and Carla Hultberg, minority chief clerk.

Mr. JORDAN. The Subcommittee on Regulatory Affairs will get rolling here. I will start with an opening statement, and then, obviously, the ranking member will have an opening statement, and then we will get right to our witness. We want to thank the deputy for being here today.

Earlier this month, we learned that the unemployment rate rose to 9.2 percent. Americans are struggling because there just aren't enough jobs. As I have said many times before in this subcommittee, one reason explaining the stagnant jobs numbers is the administration's stubborn determination to issue multiple onerous regulations all at once. The cumulative impacts of these regulations are preventing American job creators from putting people back to work.

As part of the committee's ongoing commitment to promote job creation, today's hearing continues our examination into Federal regulations that are holding back economic growth and keeping employers from getting Americans back employed, back to work.

At the last hearing, this subcommittee focused on EPA's permatorium on Appalachian coal and the impact it is having on

jobs in that region. Today's hearing will examine the cumulative effect of a series of EPA regulations that will impact the Nation's power supply and will hit particularly hard the areas of the country that rely on coal for energy.

I am especially concerned about my home State of Ohio, which is the Nation's fourth largest consumer of coal, and depends on it to provide power for its manufacturing base. These regulations have been collectively referred to as EPA's train wreck. They include changing the standards of Cooling Water Intake Structures, altering the mercury and air toxic standards for power plants, known as utility MATS, and the Cross-State Air Pollution Rule, also known as the Transport Rule, the new regulations of coal ash, and finally lowering the national ambient air quality standard for ozone, among other rules. We have a chart that shows how all this is coming together in the next few years. We will seek to get at the impact this is going to have on employers.

The job-killing threat posed by these regulations comes from the timing and expense of the various mandates. By EPA's own analysis, these are some of the most expensive rules on record. For example, EPA estimates that the Utility MACT Rule is projected to cost $10.9 billion in 2016, and the Cooling Water Intake Rule could cost as much as $4.8 billion a year. NAAQS for ozone is projected to cost a staggering $1 trillion in costs to manufacturers and, according to the National Association of Manufacturers, lead to 7.3 million jobs lost between 2020 and 2030.

The committee is deeply concerned as EPA developed these regulations, it never took into account the cumulative impact of its actions. The North American Electric Reliability Corp., an organization charged with ensuring the reliability of America's bulk power system, warns that the EPA's regulations will remove as much as 76 gigawatts of electrical capacity by 2018. To put this in perspective, this is enough electricity to power approximately 23 million homes forever.

Moreover, according to another study, just the Utility MACT and Clean Air Transport Rules alone will eliminate 1.44 million jobs from 2013 to 2020 due to the rising costs of energy. In fact, this same study estimates that nationwide electricity costs will increase by 11.5 percent. Our State of Ohio and other Midwestern States will be hit even harder.

EPA should have considered the cumulative impact of these rules before acting in order to minimize these negative impacts.

Let's make one thing clear: No one wants dirty air. That is not what this hearing is about. However, we do need to be smart about the regulations that we as a country issue. It appears from the lack of analysis on cumulative regulatory effects conducted by the EPA that there is a high chance the left hand doesn't know what the right one is doing at the Environmental Protection Agency.

The testimony we hear today will help us examine what can be done better to avoid these regulatory train wreck situations. Our economy has been in trouble for a long time now. And the least we can do here in Washington is make sure the government is not causing the problem. Americans want to get back to work, and we need to be certain that we are not stopping them. I thank the wit-

nesses for appearing. I look forward to hearing from our all witnesses today.

With that, I will now recognize my good friend and distinguished Member from Ohio, Mr. Kucinich.

[The prepared statement of Hon. Jim Jordan follows:]

Chairman Jim Jordan's Opening Statement
Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending
"Lights Out: How EPA Regulations Threaten Affordable Power and Job Creation"
July 26, 2011

Earlier this month, we learned that the unemployment rate rose to 9.2%. Americans are struggling because there just aren't enough jobs. As I have said many times before in this Subcommittee, one reason explaining the stagnant jobs numbers is the Obama Administration's stubborn determination to issue multiple onerous regulations, all at once. The cumulative impacts of these regulations are preventing America's job creators from putting people back to work.

As part of the Committee's ongoing commitment to promote job creation, today's hearing continues our examination into federal regulations that are holding back economic growth and keeping employers from getting Americans back to work. At the last hearing, this Subcommittee focused on EPA's permitorium on Appalachian coal and the impact it is having on jobs in that region. Today's hearing will examine the cumulative effect of a series of EPA regulations that will impact the nation's power supply—and will hit particularly hard the areas of the country that rely on coal for energy. I am especially concerned about my home state of Ohio, which is the nation's fourth-largest consumer of coal and depends on it to provide power for its manufacturing base.

These regulations have been collectively referred to as EPA's "train wreck." **(Show timeline)** They include changing the standards for cooling water intake structures, altering the Mercury and Air Toxics standards for power plants (known as "Utility MACT."), the Cross-State Air Pollution Rule (also known as the Transport Rule), new regulations of coal ash, and finally lowering the National Ambient Air Quality Standard (NAAQS) for Ozone, among other rules.
The job-killing threat posed by these regulations comes from the timing and expense of the various mandates. By EPA's own analyses these are some of the most expensive rules on record. For example, EPA estimates that the Utility MACT rule is projected to cost $10.9 billion in 2016, and the cooling water intake rule could cost as much as $4.8 billion per year. NAAQS for ozone is projected to cost a staggering $1 trillion in costs to manufacturers and according to the National Association of Manufacturers, lead to 7.3 million jobs lost between 2020 and 2030.

The Committee is deeply concerned that as EPA developed these regulations, it never took into account the cumulative impact of its actions. The North American Electric Reliability Corporation, an organization charged with ensuring the reliability of America's bulk power system, warns that EPA's regulations will remove as much as 76 gigawatts of electrical capacity by 2018. To put this in perspective, this is enough electricity to power approximately 23 million homes. Moreover, according to another study, just the Utility MACT and Clean Air Transport rules alone will eliminate 1.44 million years jobs from 2013 to 2020 due to the rising cost of energy. In fact, this same study estimates that nationwide electricity costs will increase by 11.5 percent. My home state of Ohio and other Midwestern states will be hit even harder. EPA should have considered the cumulative impact of these rules before acting in order to minimize these negative impacts.
Let's make one thing clear—no one wants dirty air and that is not what this hearing is about. However, we do need to be smart about the regulations that we as a country issue. It appears, from the lack of analysis on cumulative regulatory effects conducted by EPA, that there is a high chance the left hand doesn't know what the right one is doing at EPA.

The testimony we hear today will help us examine what can be done better to avoid these regulatory train wreck situations. Our economy has been in trouble for a long time now and the least we can do here in Washington is make sure that government is not causing the problem. Americans want to get back to work and we need to be certain that we're not stopping them. I thank the witnesses for appearing and look forward to hearing from them.

Mr. KUCINICH. Thank you very much, Mr. Chairman.

I want to thank all the witnesses who will be testifying today about a critical issue facing America, the protection of clean air and clean water, on which we depend every single day.

Today, we will once again take a look at the role the EPA plays in supporting these goals. Air toxics from coal-fired power plants cause or contribute to devastating health problems, ranging from asthma attacks to premature death from cardiovascular disease, stroke, and cancer. One air toxic, mercury, damages the developing brains of fetuses, infants, and small children, robbing them of the opportunity to fully develop intellectually and physically.

Coal-burning emissions of sulfur oxides and nitrogen oxides help fuel our Nation's asthma problem and can increase heart attacks. The burning of coal is also a major contributor to the environmental, national security, and economic crisis that is global climate change. The combustion of coal produces a tremendous amount of carbon dioxide, a greenhouse gas that contributes to increased trapping of heat in our atmosphere.

In fact, coal accounts for approximately 20 percent of all our greenhouse gas emissions. It would be difficult to underestimate the urgency of shutting down coal power plants immediately for this reason alone.

These health and environmental consequences from toxic pollution are why the EPA is developing tougher safeguards to protect Americans. One proposed rule on mercury and air toxics alone would be estimated to save as many as 17,000 lives every year by 2015, to prevent up to 120,000 cases of childhood asthma.

One of the witnesses here to testify today represents the American Electric Power Co., which is headquartered in Columbus, Ohio. AEP is also one of our Nation's biggest polluters. Another one of Ohio's polluters, First Energy Corp., which owns the Lakeshore Plant in Cleveland, near my own district, is identified as the Nation's sixth most harmful plant for low-income communities and communities of color.

Thanks in part to AEP and First Energy, the State of Ohio has more coal-fired generating capacity than any other State in the Nation.

Ohio's electric sector also has the dubious honor of ranking first in the amount of toxic air pollution emitted in 2009, emitting more than 44.5 million tons of harmful chemicals, which accounted for 65 percent of the State's pollution and 12 percent of toxic pollution from all U.S. power plants.

Ohio also ranked third among all States in mercury air pollution from power plants, with about 3,980 pounds emitted in 2009, which accounted for 76 percent of the State's mercury air pollution and 6 percent of the U.S. electric sector pollution.

AEP has also lobbied against the Environmental Protection Agency's current efforts to regulate power plant pollution and is pushing legislation to weaken and delay these regulations.

I look forward to hearing from AEP today about how they can justify the tragic and destructive side effects that coal-fired power plants wreak upon us, as well as what steps they are taking to curb emissions of toxic air pollution.

While it is consistent with the history of big business to kick and scream about having to minimize social and environmental harms they cause, we should not underestimate the entrepreneurial ability of America's electric sector to invest, retrofit, and construct clean energy generation while maintaining system reliability.

In fact, when they upgrade our Nation's electric generation infrastructure to comply with new regulations, their capital investments will help drive economic growth and create jobs. According to a study by the Political Economy Research Institute at the University of Massachusetts, two of the proposed EPA regulations, Clean Air Transport Rule and the new Mercury and Air Toxic Standards, could stimulate the creation of 1.4 million jobs over the next 5 years in the pollution controls, engineering, and construction fields.

Congress passed the Clean Air Act and the Clean Water Act because the American public demanded it. The American people demanded it because they didn't like their children to inhale and drink and die from toxic compounds from which even the most diligent parent can't protect his or her child. Nothing about this equation has changed.

We must allow the EPA to continue to fulfill its mandate to protect our water and the air. And I look forward to hearing from the EPA today about how it continues to fulfill its promise.

We can't get into a position where it is either jobs or a clean environment. We have to insist that we have to have both. And the approach of the 21st century that is going to be economically viable and economically successful and that will help grow our economy is to be able to catch the wave of new technologies that can help use the resources we have now and do it in such a way that we protect the quality of the air and the water.

With that, I want to thank the chair, and I yield back.

Mr. JORDAN. I thank the gentleman.

Members have 7 days to submit opening statements.

We now welcome our first witness, Mr. Bob Perciasepe.

Great name to say, like saying Sheboygan, or one of those names you like to say.

Mr. KUCINICH. Like Kucinich.

Mr. JORDAN. Like Kucinich. Exactly.

He is the deputy administrator of the Environmental Protection Agency.

We feel privileged to have you here today, Mr. Perciasepe.

And pursuant to the rules of the committee, all witnesses are sworn in. So please rise and raise your right hand.

[Witness sworn.]

Mr. JORDAN. Answer in the affirmative. Let the record show that the witness has answered in the affirmative.

And the floor is yours, Mr. Administrator. Go ahead.

STATEMENT OF ROBERT PERCIASEPE, DEPUTY ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY

Mr. PERCIASEPE. Thank you, Mr. Chairman, and Ranking Member Kucinich.

Mr. KUCINICH. Would the gentleman please speak directly into the mic? That would be helpful.

Mr. PERCIASEPE. Yes, sir. I will get a little closer there. I see what you are talking about. I want to thank you for inviting me today. And I appreciate the opportunity to appear before you.

When you ask whether EPA regulations will cause the lights to go out, I want to be able to assure you that the answer is no. We do not have to choose between breathing clean air and running an air conditioner or turning on the lights at night.

The power plant rules that EPA is developing are necessary to protect public health and the environment from pollution produced by these plants, especially the oldest, dirtiest, and least efficient of them.

We are not the first administration to recognize the need to clean up power plants and to issue rules to address that need. In fact, since 1989, when President George H.W. Bush proposed what became the Clean Air Act amendments of 1990, power plant cleanup has been the continuous policy of the U.S. Government under two Democratic and two Republican Presidents.

While past EPA rules have made progress in reducing the harmful effects of pollution, more remains to be done to ensure that all Americans have the clean environment to which they are entitled.

EPA's recent and upcoming actions to control pollution from power plants will achieve major public health benefits for Americans that are significantly greater than the costs. These pollution-reducing rules are affordable, and they are technologically achievable.

There is tremendous public support for moving forward with these rules. For instance, since March, we have received over 800,000 comments from across the country in support of regulatory mercury emission controls from power plants.

The Cross-State Air Pollution Rule finalized earlier this month illustrates significant health benefits from reducing power plant pollution. In a single year, 2014, this rule is projected to produce benefits valued at over $120 billion to up to $280 billion and to avoid up to 34,000 premature deaths.

Our analysis and past experience indicate that warnings from some of dire economic consequences of moving forward with these important rules are exaggerated at best. A publicly available analysis shows that these rules are affordable. This is corroborated by other outside groups and by some in industry who recognize that issuing the rules in the same timeframe helps provide power companies with the certainty they need to make smart and cost-effective investments.

As we did more than two decades ago, we are also hearing claims that our rules will lead to potential adverse effects on electric reliability. EPA's analysis projects that the agency's rules will result in only a modest level of retirements and that these retirements are not expected to have adverse impact on electric generation and resource adequacy.

Our rules will not cause the lights to go out.

These studies are often based on incorrect assumptions about the requirements of EPA rules and are inconsistent with the actual proposals that come out. In most cases, the analyses were performed before many of the regulations were even proposed. Simply

put, many of these studies are not based on the reality of what the agency is actually proposing to do.

In closing, I would like to suggest that the subcommittee should be clear about what is at stake here, as those who have stalled in cleaning up their pollution for further delays. Delay encourages companies to keep cash on the sidelines instead of spending it and putting people to work modernizing their facilities. And most importantly, delay means public health benefits of reducing harmful pollution are not realized.

Thank you for allowing this opening comment. I look forward to your questions.

[The prepared statement of Mr. Perciasepe follows:]

Opening Statement of Bob Perciasepe
Deputy Administrator
U.S. Environmental Protection Agency

Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending
Committee on Oversight and Government Reform

July 26, 2011

Chairman Jordan, Ranking Member Kucinich and members of the subcommittee, I appreciate the opportunity to appear before you today to testify on EPA's regulations affecting the electric power industry.

You ask whether EPA's regulations will cause the lights to go out. I can assure you – the answer is no. We do not have to choose between the significant public health benefits from reducing air pollution from power plants and a robust, reliable electric grid to power the U.S. economy.

The power plant rules that EPA is developing are necessary to protect public health and the environment from pollution produced by these plants – especially the oldest, dirtiest, and least efficient of them.

We are not the first Administration to recognize the need to clean up power plants and to issue rules to address that need. In fact, since 1989, when President George H.W. Bush proposed what became the Clean Air Act Amendments of 1990, power plant clean-up has been the continuous policy of the U.S. government under two Democratic and two Republican presidents.

Over the years, many power plants have invested in modern pollution controls to reduce their emissions and have contributed to the significant progress this country has made in providing healthy air to our citizens. Many other power plants, however, have delayed the investments in widely available pollution control equipment. Power plants today are still the country's largest source of SO2 and of mercury, and the largest stationary source of NOx.[1]

Some elements of the power industry have sought for many years to delay the Congressional mandate to control air pollution, especially the requirement to reduce emissions of mercury and other toxic air pollutants through the use of widely available pollution control equipment. The harmful pollution emitted by these plants contributes significantly to a wide variety of public health and environmental problems. While past EPA rules have made progress in reducing the harmful effects of pollution, more

[1] EPA National Emissions Inventory. (http://www.epa.gov/air/emissions/nox.htm#noxnat, http://www.epa.gov/air/emissions/so2.htm).

remains to be done to ensure that all Americans have the clean environment to which they are entitled.

EPA's recent and upcoming actions to control pollution from power plants will achieve major public health benefits for Americans that are significantly greater than the costs. These pollution-reducing rules are affordable, and they are technologically achievable.

For example, on July 6, 2011, EPA issued the Cross-State Air Pollution Rule to protect public health and the environment and help states meet air quality standards. The long-overdue Mercury and Air Toxics Standards (MATS) under section 112 of the Clean Air Act, proposed on March 16, 2011, represent the first-ever national limits on mercury and other toxic air pollution released from power plant smokestacks. And EPA is pursuing standards to protect aquatic life from cooling water intake systems under section 316(b) of the Clean Water Act.

There is tremendous public support for moving forward with these rules. For instance, since March, we have received over 800,000 comments from across the country in support of regulating mercury emissions from power plants.

The Cross-State Air Pollution Rule illustrates the significant health benefits from improving air quality. In a single year (2014), the Cross-State Air Pollution Rule is projected to produce benefits valued at $120 billion to $280 billion and to avoid:[2]

- Up to 34,000 premature deaths
- 15,000 heart attacks
- 400,000 cases of aggravated asthma
- 19,000 cases of acute bronchitis
- 19,000 hospital and emergency room visits.
- Over 1.8 million days when people miss work or school

In developing these rules, the EPA has focused not only on the long overdue health benefits that will result from decreasing emissions of harmful pollutants from power plants, but also on the economic effects associated with implementing the emission reductions. Our publicly available analyses, which involve detailed modeling of the impacts on the power sector of CSAPR, MATS and 316(b), shows that these rules are affordable.

The investments in a cleaner energy sector required by these standards will create jobs. EPA estimates that the proposed mercury and air toxics rule could support 31,000 job years of short-term construction work and net 9,000 long-term utility jobs.[3] Money spent on pollution controls at power plants provides high quality American jobs in

[2] EPA final Cross-State Air Pollution Rule Table VIII.C-1 Estimated Annual Reductions in Incidences of Health Effects Based on 2014 Modeling. http://www.epa.gov/crossstaterule/actions.html
[3] Regulatory Impact Analysis for the Proposed Toxics (now MATS) Rule, U.S. EPA, March 2011. http://www.epa.gov/ttn/ecas/regdata/RIAs/ToxicsRuleRIA.pdf.

manufacturing steel, cement, and other materials needed to build the pollution control equipment, in creating and assembling control equipment; in installing the equipment; and in operating and maintaining the equipment. And many of these are jobs that cannot be shipped overseas.

While you will hear from some in industry that the rules are not achievable and not cost effective, our analysis and past experience indicate that warnings of dire economic consequences of moving forward with these important rules are exaggerated at best.

For example, during development of the 1990 Clean Air Act Amendments, industry estimated that the cost of the new requirements for sulfur dioxide would be $7.5 billion per year. In reality, the cost of achieving the reductions was around a $1.5 billion per year – a fraction of the costs estimated by those seeking to prevent enactment of that landmark legislation.[4]

In fact, at the time, American Electric Power warned of "the potential destruction of the Midwest economy." The Southern Company warned of unrealistic compliance dates and issues with electrical reliability. These predictions were not true then, and industry's remarkably similar claims about the current Clean Air Act regulations are not true now.

A rigorous, peer-reviewed EPA study of the 1990 Clean Air Act amendments has found that they are delivering health improvements to the American people worth $30 in benefits for every $1 in costs.[5] Most of the $30 in direct benefits comes from avoided premature deaths as a result of cleaner air, with other benefits including fewer emergency room visits over the years for an asthmatic child, fewer sick days for an American worker trying to compete in the global marketplace, and longer and healthier life for an elderly retiree. Not all of these benefits of cleaner air show up in GDP and other measures of economic activity, but they nonetheless have real value to the people who experience these health gains. Furthermore, EPA's peer-reviewed study also found that fewer sick days for American workers and lower health care costs for American families achieved by cleaner air leads to an economy which grows faster and is healthier in the long run.

The reductions can be met using controls that are well understood and available, the standards allow adequate time for compliance, and we estimate that national electricity rates will not rise above historic levels, although there will be regional variations. In fact, industry has moved rapidly to comply with past requirements. For example, scrubbers

[4] National Acid Precipitation Assessment Program Report to Congress: An Integrated Assessment, 2005 http://www.epa.gov/airmarkets/resource/docs/NAPAP.pdf

5 U.S. Environmental Protection Agency (2011). The Benefits and Costs of the Clean Air Act from 1990 to 2020 - Rev. A. April 2011. http://www.epa.gov/cleanairactbenefits

have been installed on units accounting for an average of 20 gigawatts of generating capacity each year between 2008 and 2010. The industry also added 150 gigawatts of new generating capacity between 2001 and 2003.

EPA conducted feasibility analyses for both CSAPR and the MATS proposal. [insert reference to citations Jeb is pulling from technical support docs] The analysis for the proposed MATS rule takes the proposed CSAPR (then called the Transport Rule) into account. According to our analysis, companies will have sufficient time to meet their Clean Air Act regulatory requirements:

> "Our analysis shows that the expected number of retirements is less than many have predicted and that these can be managed effectively with existing tools and processes for ensuring continued grid reliability. Further, the industry has adequate resources to install the necessary controls and develop the modest new capacity required within the compliance schedule provided for in the CAA. Although there are a significant number of controls that need to be installed, with proper planning, we believe that the compliance schedule established by the CAA can be met. . . . EPA believes that the ability of permitting authorities to provide an additional 1 year beyond the 3-year compliance time-frame as specified in CAA section 112, along with other compliance tools, ensures that the emission reductions and health benefits required by the CAA can be achieved while safeguarding completely against any risk of adverse impacts on electricity system reliability."[6]

EPA specifically addressed reliability in the MATS preamble and concluded that Clean Air Act requirements could be met without adversely affecting power sector reliability:

> "In summary, EPA believes that the large reserve margins, the range of control options, the range of flexibilities to address unit shutdowns, existing processes to assure that sufficient generation exists when and where it is needed, and the flexibilities within the CAA, provide sufficient assurance that the CAA section 112 requirements for the power sector can be met without adversely impacting electric reliability."[7]

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[6] Excerpts from May 3, 2011 FR notice -- MATS proposal, page 25057 http://www.epa.gov/ttn/atw/utility/fr03my11.pdf

[7] Excerpts from May 3, 2011 FR notice -- MATS proposal, page 25057 http://www.epa.gov/ttn/atw/utility/fr03my11.pdf

Our analyses have been corroborated by other outside groups and by some in industry who are calling for us to move quickly to implement the new regulations.[8] While some in industry are seeking to delay the upcoming regulations, many others recognize that issuing the rules in the same timeframe helps provide power companies with the certainty they need to make smart and cost-effective investments. The Clean Energy Group[9] recently said, "Needed regulatory certainty will result from EPA's timely implementation of regulations consistent with the Clean Air Act, which is in the best interests of the electric industry, the market, and customers."[10] The Chief Executive Officers of eight electric companies have also stated that: "Contrary to claims that EPA's agenda will have negative economic consequences, our companies' experience complying with air quality regulations demonstrates that regulations can yield important economic benefits, including job creation, while maintaining reliability."[11]

The Chairman and CEO of Wisconsin Energy has said, "We see very little impact on customer electric rates or our capital plan between now and 2015 as a result of the new EPA regulations."[12]

As we did more than two decades ago during debate of the Clean Air Act Amendments of 1990, we are also hearing claims that our rules will lead to potential adverse impacts on electric reliability. EPA has examined impacts on the amount of available generation as it proposes and finalizes its rules so far, and the Agency will build upon these analyses as it finalizes upcoming power sector regulations. These analyses project that the EPA rules will result in only a modest level of retirements – of older, dirtier, less efficient power plants – and that these retirements are not expected to have an adverse impact on electric generation resource adequacy.[13] Our rules will not cause the lights to go out.

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[8] "Transport Rule Engineering Feasibility Response to Comments" for the Cross-State Air Pollution Rule. http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2009-0491-4529

[9] The Clean Energy Group's Clean Air Policy Initiative members include Austin Energy, Avista Corporation, Calpine Corporation, Constellation Energy, Exelon Corporation, National Grid, New York Power Authority, NextEra Energy, PG&E Corporation, Public Service Enterprise Group, Inc., and Seattle Light.

[10] Letter to Lisa Jackson, Administrator, EPA, from Michael Bradley, Executive Director of the Clean Energy Group's Clean Air Policy Initiative (June 15, 2011), http://www.thecleanenergygroup.com/documents/Letter_Jackson_UtilityToxicsRule.pdf

[11] Peter Darbee, chairman, president and CEO,PG&E Corp.; Jack Fusco, president and CEO, Calpine Corp.; Lewis Hay, chairman and CEO, NextEra Energy, Inc.; Ralph Izzo, chairman, president and CEO, Public Service Enterprise Group, Inc.; Thomas King, president, National Grid USA,; John Rowe, chairman and CEO, Exelon Corp.; Mayo Shattuck, chairman, president and CEO, Constellation Energy Group; Larry Weis, general manager, Austin Energy , "We're OK With the EPA's New Air-Quality Regulations," Letter to the Editor, Wall Street Journal, December, 8, 2010.

[12] May 3, 2011 Wisconsin Energy Corporation 1st Quarter 2011 Earnings Call.

[13] The Cross-State Air Pollution Rule projects about 5 GW of incremental coal capacity retirements by 2014. Analysis for the MATS proposal predicts that the rule results in about 10 GW of incremental coal capacity retirements by 2015. Total coal fired capacity for the US is about 315 GW.

A number of analyses of the Agency's rules have been done in the last several months.

In August 2010, the Analysis Group released a report commissioned by several utilities on the reliability impacts of the Cross-State Air Pollution Rule and Mercury Air Toxics Standard. Their analysis concluded that the *"electric industry is well-positioned to comply with EPA's proposed air regulations without threatening electric system reliability."* This month, they updated that report based on the actual Mercury Air Toxics Standard proposal, recent financial statements from industry, and recent activity in the markets for additional electricity capacity. This update *"reaffirms the major conclusion of the prior report that the electric industry can comply with EPA's air pollution rules without threatening electric system reliability provided that EPA, the industry and other agencies take practical steps to plan for the implementation of these rules and adopt appropriate regulatory approaches."*[14]

The most recent analysis conducted on these issues is last month's report by the Bipartisan Policy Center. That report identified a variety of significant flaws in many of the previous industry studies of reliability and concluded that "*scenarios in which electric system reliability is broadly affected are unlikely to occur.*"[15]

EPA is aware of industry studies suggesting, contrary to the EPA's and other groups' analyses, that these rules will result in substantial power plant retirements that will have adverse effects on electric reliability in some regions of the country. While the particulars of these analyses differ, in general they share a number of serious flaws that call their conclusions into question:

- First, these studies often make assumptions about the requirements of the EPA rules that are inconsistent with, and dramatically more expensive than, the EPA's actual proposals. In most cases, the analyses were performed before many of the regulations in question were even proposed.
- Second, in reporting the number of retirements, many analyses fail to differentiate between plant retirements attributable to the EPA rules and inefficient and costly plants that that are already scheduled for retirement because owners make the business decisions not to pay to clean up their emissions.
- Third, many analyses do not account for the whole host of tools, including new generation, demand response, energy efficiency, transmission upgrades and energy storage, that can be used to maintain reliability.

[14] Analysis Group, June 2011, "Ensuring a Clean, Modern, Electric Generating Fleet while Maintaining Electric System Reliability" (emphasis added).
[15] Bipartisan Policy Center, June 2011, "Environmental Regulation and Electric System Reliability"

For example, the North American Electric Reliability Corporation (NERC) report released last fall attributed the "greatest potential impact" to the not-yet-proposed section 316(b) cooling water intake rule. The analysis incorrectly assumed that in order to deal with the entrainment aspects of cooling water withdrawal, the EPA's rule would require installation of cooling towers at virtually all existing power plants. In reality, the proposed rule requires a plant-by-plant determination of appropriate technology for entrainment by permitting authorities (mostly State) and requires these authorities to take costs and impacts on electric reliability into account. This assumption alone accounts for up to 40 gigawatts of projected retirements, and several other studies share this same assumption. The now proposed 316(b) rule is based on site-specific decisions *to determine if cooling towers are appropriate, and while* it is not possible to predict how much capacity will be affected, *it will clearly be less than originally predicted. Moreover, industry has applauded this flexible, site-specific entrainment determination.* . The NERC report also failed to include many relevant response measures available to States, State Public Utility Commissions, and utilities, and relied on an out-of-date long-term reliability assessment[16] (also done by NERC) that understated future electric generating capacity slated to come online and overstated future growth in electricity demand.

Simply put, many of the studies which have dire predictions for increases in electricity rates, reliability and other economic consequences are not based on the reality of the proposals the Agency is considering. The Agency's robust analyses indicate that the proposed regulations will continue to build on the EPA's 40-year record of success in reducing harmful pollution while growing our economy.

In closing, I would like to suggest that the subcommittee should be clear about what is at stake here as those who have stalled in cleaning up their pollution call for further delays. Delay encourages companies to keep cash on the sidelines instead of spending it putting people to work modernizing their facilities. And most importantly, delay means that the public health benefits of reducing harmful pollution are not realized.

Thank you for the opportunity to testify today. I look forward to your questions.

[16] http://www.nerc.com/page.php?cid=4%7C61

Mr. JORDAN. Thank you, Mr. Deputy.

Let me just start with one of the things that the ranking member referenced in his opening statement, and I think you alluded to it as well, was the jobs that can be created when you have to refit and retool and make changes.

But what do you say—and did you look at this, this idea that there can also be job loss? As I pointed out in my opening statement, the National Association of Manufacturers, they cite the number 7.3 million jobs they believe that can be lost between 2020 and 2030. So did EPA look at all at the other side?

Obviously, we know if you have to retool something, there has to be someone to come in and go to work, putting that structure together in a different way, retrofitting, doing what needs to be done. Obviously, that is pretty easy to calculate. But did you look at the other side of the ledger?

Mr. PERCIASEPE. Yes. When we look at the cost of rules, we look at all the different aspects of it under the OMB regulations that we are required to use. And I might say that American industry and in particular the American power industry has been becoming more and more efficient. Over the last 10 years, even without these rules, the amount of megawatts that are produced continues to go up.

Mr. JORDAN. Every business has been doing that.

Mr. PERCIASEPE. Every business is doing this. Oil refineries, power plants, the amount of output continues to go up, but the number of employees continues to go down as they become more and more efficient over time with more efficient plants. And some of the transition that takes place when we enact these rules is creating a more efficient fleet of power-generating units.

Mr. JORDAN. But I just want to be clear, did you do what the executive order requires you to do, which is a cumulative impact study on—I mean, I am reading right here from the executive order, each agency shall tailor its regulations to impose the least burden on society, including businesses and individuals, including businesses of differing sizes. Did you comply with the Executive order?

Mr. PERCIASEPE. Yes. Yes. Excuse me.

When we propose a rule, like let's say the Mercury and Air Toxics Rule, we start from the base that includes the rules that have already been done. And then we want to be able to make sure we specify what the current rule that we are proposing is actually going to do for transparency purposes so we can look at how that builds on the cumulative impact of what has gone before.

Mr. JORDAN. Can you look at the statement then on the screen? It should be in front of you there on your screen.

Mr. PERCIASEPE. Which RIA are we talking about?

Mr. JORDAN. Coal ash. The coal ash rule.

Mr. PERCIASEPE. I see at the bottom. I am sorry. That proposal is out—has been out, and we have put out some additional requests for information on that. That is quite a ways away from being finalized.

Mr. JORDAN. Okay. Let me ask you this. Do you think, though, that, a more general question, do you think that there is ever a point where regulation can in fact be a strong impediment to job

growth, and actually be—actually cost jobs, actually result in the reduction of jobs? Do you think that is something that should be kept clear in mind as we are proposing new regulations?

Mr. PERCIASEPE. Well, I think we have to look at the economic impact of rules under the executive order, as you have pointed out. And that is what we do. And we also try to do it based on the foundation of what has already gone by.

But EPA also goes beyond that, particularly under the Clean Air Act. We look at the cumulative benefits and costs of the rule—of all the rules all together since the Clean Air Act—the amendments at least of 1990. So let's say going back 20 years. Under section 812, I think it is, of the Clean Air Act, we do a cumulative benefit and cost analysis on the entire implementation of the Clean Air Act. And the cost and benefits so far, since 1990, are about ahead by about 30 to 1.

Mr. JORDAN. Can you take a look at this statement? Because of these complexities, as well as the limited time and resources within the expedited schedule, we are limited in our ability to quantify the cost and benefits of obtaining separate secondary NAAQS for ozone for this proposal. So that would seem to indicate to me that you did not do a full cumulative impact study because you say right in your statement, cost and benefits. That is what we are looking at. That is the whole cumulative issue there. You seem to say you are not complying with it in that statement there.

Mr. PERCIASEPE. Yes. So the National Ambient Air Quality Standard is a standard. It is not self-implementing. What it does is it sets in motion a planning process that goes on for a number of years to identify where those areas are in the country that would not be meeting that standard, and then, what are the implementation mechanisms that are used to implement or to achieve that standard? Each one of those requires that kind of detailed analysis once we get to that point. But the standard itself is a science-based standard based on what——

Mr. JORDAN. And does the EPA have any idea what that standard is going to cost when implemented? That is the point.

Mr. PERCIASEPE. We do a regulatory impact analysis that looks at the best estimate we could make, because all the implementation comes years later. We look at the best——

Mr. JORDAN. And what was your best estimate for this, for the NAAQS?

Mr. PERCIASEPE. Our estimates of benefits and cost went, depending on all the different standards that were proposed by the——

Mr. JORDAN. Can you give us a number? On one hand, you are saying you are going to create jobs for retrofitting the facilities, but we want to know overall if you did an estimate, what was the estimate on what it was going to do to job creation or job loss?

Mr. PERCIASEPE. We did the overall cost of the rule. And the overall cost of the rule, I will have to look it up for you what the——

Mr. JORDAN. And obviously cost means——

Mr. PERCIASEPE. We did the costs and the benefits in our proposal.

Mr. JORDAN. But additional costs to business means it is going to be tougher to create jobs. You would agree with that statement, wouldn't you? Particularly if it is a big number, which you can't give me.

Mr. PERCIASEPE. Well, it depends on what the final standard is, which we haven't yet decided on. We haven't yet promulgated the final.

Mr. JORDAN. One last question and then I want to yield to our ranking member. Wouldn't you agree, though, that all this coming at once—I mean you think about over the next several years we have Cooling Water Intake Structures, Utility MACT, the Transport Rule, Coal Combustion Residuals, the ozone, I mean all these different things, some starting now but some more coming online soon, don't you think that's a real cause for concern and that it is critical that you be able to provide an estimate and do the full cumulative? I mean, you can obviously see the concern that folks in this industry and this business, which is so crucial to manufacturing and a host of others, you can obviously see their concern.

Mr. PERCIASEPE. Yeah. Many of these rules you just mentioned were actually proposed in the past, and they were sent back to EPA by the courts. The Air Transport Rule that you mentioned, the air toxics—Utility Air Toxic Rule, those were proposed in the past in the last decade, and now they have been coming back and having to be reproposed. Things like the ozone standard you mentioned get implemented over a long period of time into the future. And some of them, like the water intake—the water intake rules under the Clean Water Act or the coal combustion rules under the Resource Conservation Act, those haven't been finalized yet.

Mr. JORDAN. But the point is it is all coming and it is coming pretty quickly. Even if they may have been proposed and they are gradual, they are phasing in and phasing in at different levels or higher levels, that's a concern.

Mr. PERCIASEPE. Well, I will just respectfully say I probably don't agree with that chart that you just had up there.

Mr. JORDAN. I will yield to the gentleman from Ohio.

Mr. KUCINICH. Thank you very much, Mr. Chairman.

I think it is fair to say that the utility industry is hysterical with claims that the new EPA regulations are job killing. In contrast, as the slide I would like to put up on the screen shows, a report from the University of Massachusetts entitled New Jobs, Cleaner Air, says the home States of each member of the Subcommittee on the Eastern Power Grid would fare very well with respect to jobs created by the new investment and capital improvements. Our own State of Ohio will gain as many as 76,240 jobs to build the capacity to implement the new regulations in the first 5 years. So I would like to ask Mr. Perciasepe how does the EPA's own risk assessment analysis square up with these findings from the University of Massachusetts?

Mr. PERCIASEPE. I have to say I haven't looked at this particular report.

Mr. KUCINICH. Okay. You don't have to comment on it. Will your regulations destroy more jobs or create more jobs?

Mr. PERCIASEPE. Our analysis shows, particularly on these utility rules, that it will create jobs.

Mr. KUCINICH. Okay. We are going to hear from industry representatives in the next panel that claim that compliance with the new Mercury and Air Toxic Standards and the Transport Rule is not achievable and not cost-effective. These industry advocates are making claims of dire economic consequences if we move forward with these rules. Some of our witnesses today will say that environmental protections will cost too much money, kill too many jobs, end their competitiveness. This is familiar. Industry always claims the sky will fall if they have to minimize the health and environmental harms their business practices cause. We heard the same thing from the auto industry when air bags were required. We heard the same hysteria when the Clean Air Act rules were passed in 1990.

Ford Motor Co. said in 1990, we just don't have the technology to comply with, "the tailpipe requirement set forth in the amendments." And yet they started making cars that complied with the tailpipe requirements in 1993.

Now, Mr. Perciasepe, can you talk about how industry fared after the 1990 amendments? Are there any lessons to be drawn here with the new proposed rules? From your perspective, is industry exaggerating the detrimental impacts of the regulations?

Mr. PERCIASEPE. Well, some of the studies that we have been able to review have a number of—that they have done that demonstrate these impacts have some significant flaws to them. First of all, and I mentioned this in my opening comments, they make assumptions about rules that we haven't finalized yet. For instance, on the cooling water regulation that we have been talking about, some of those studies have assumed that every power plant would have to install a closed loop cooling system or a cooling tower.

That is not what we proposed, and we still haven't even finalized that rule. So these end up causing exaggerated estimates of what the costs of the rule would be. They don't differentiate between plants that are getting old and need to close or for economic and business reasons, need to be phased out as new generating capacity comes out versus ones that might be associated with a rule that EPA is proposing. They also don't include the flexibilities that are in the Clean Air Act that when you get—when you actually implement these rules, there are certain flexibilities that are included in the Clean Air Act that are not considered in these studies. So, by definition, then, they come up with an exaggerated estimate of what the impact would be.

Mr. KUCINICH. On July 20, 2011, the Washington Times ran an op-ed by Steve Milloy, the publisher of junkscience.com titled "Show Us the Bodies, EPA." The subtitle reads, "Green agency uses phony death statistics to justify job killing rules."

The op-ed described a TV ad run by the Environmental Defense Fund, saying, the TV ad for this theme features a young girl in a hospital bed supposedly having an asthma attack. She's wearing a nebulizer face mask and chest compression device that is rhythmically but disturbingly squeezing the child, giving the appearance that she is in severe respiratory distress, by implication from air pollution. But like the EPA's 17,000-lives-saved statistical fabrication, the ad's a fake.

Now, Mr. Perciasepe, I would like to give you a chance to respond to this op-ed. It is apparently aimed at EPA's proposed air toxics rule. Are EPA's estimated benefits from the proposed rule a statistical fabrication?

Mr. PERCIASEPE. They are based on peer-reviewed science. They are not a statistical fabrication. And you are not going to see on somebody's death certificate, they died of air pollution. They are going to die of the diseases that air pollution exacerbates and causes premature impacts. Even healthy people are impacted. But people who are more vulnerable, like retired folks, are going to be even more vulnerable to these things, so the impact of the damage on the lungs and the cardiovascular system.

So I know you have other witnesses that will go into the science of this in more detail, but these are not fabricated. They are based on peer-reviewed science, both clinical and epidemiological studies.

Mr. KUCINICH. Mr. Milloy's op-ed also questioned the public health impacts of mercury pollution. He wrote, "but there is no evidence that ambient levels of mercury or mercury emissions from U.S. power plants have harmed anyone." Now, Mr. Perciasepe, isn't there clear evidence showing that mercury impairs the brain development of infants and children?

Mr. PERCIASEPE. There are mercury warnings in every State for fish contaminated with mercury. Mercury causes damage to developing brains in children and fetuses.

Mr. KUCINICH. So is that a yes?

Mr. PERCIASEPE. So yes.

Mr. KUCINICH. Okay. Can you describe why it is important to control mercury pollution from domestic power plants? Isn't there a disproportionate impact on communities near plants that emit mercury pollution?

Mr. PERCIASEPE. The mercury emissions from the power plants in the United States are the largest remaining source in the United States of mercury emissions. And they are—they affect the water. And the mercury bio-accumulates in fish. And then fish get eaten by humans.

But I want to point out one last thing on this point. The mercury and toxics rule is not just mercury. It includes acid gases, arsenic, nickel, cadmium, all these other metals and acid gases that also have health effects are included, which is why you have to look at the broad impact of all those different toxics, not just mercury, although mercury is very important.

Mr. KUCINICH. Thank you very much. Mr. Chairman, yield back.

Mr. JORDAN. Thank the gentleman.

Mr. Deputy, do you think your rules could result in a higher cost for energy?

Mr. PERCIASEPE. When we analyzed the cost of our rules, and let's just use the air toxics, the Utility MACT as you call it here, of the Mercury and Air Toxics Rule, we do estimate that it will have an increase in electric rates and an increase in natural gas rates. Those increases are expected to be in the variability of historic levels of these——

Mr. JORDAN. I just want to be clear. So the U.S. Environmental Protection Agency admits that the rule changes will result in higher electricity costs.

Mr. PERCIASEPE. A very small increase in electric costs. But actually, the electric costs even with this rule——

Mr. JORDAN. Let me be clear. You say there is going to be an increase in cost for energy.

Mr. PERCIASEPE. The increase in costs will still—the cost of electricity will be less——

Mr. JORDAN. Is the answer yes or no to increased energy?

Mr. PERCIASEPE. If I could just answer it, to answer your first question, it will be—the costs of electricity will still be less than it was in 2009, even with the increase.

Mr. JORDAN. Then if there is going to be increased energy costs, do you think that can also translate into lost jobs or maybe not as many jobs being created as otherwise would have been?

Mr. PERCIASEPE. I say——

Mr. JORDAN. And we are talking, obviously, we are talking people who use the energy.

Mr. PERCIASEPE. I understand that. And I want to be really clear, the baseline that people currently pay for electricity is less than it was several years ago. And this increase will keep it, it still will be less than it was several years ago. We do not see it having an impact——

Mr. JORDAN. Maybe you are missing the point. What they are paying now, are your rules going to make it—I am not worried about 2009. I am worried about now. We have 9.2 percent unemployment now. So what they are paying now, are the rules you are proposing going to mean energy costs more? I thought the answer was yes. Is that what you are saying? So, furthermore, if the answer is yes, which it is, then there could be some other results or ramifications down the road for job creators and businesses across the country at a time we have 9.2 percent unemployment.

Mr. PERCIASEPE. We do not see the small increase in the price of electricity from this rule, which is not different than the normal variation in the prices over the last decade, to have any significant impact.

Mr. JORDAN. You may not, but my guess is small business owners, my guess is manufacturers probably do. When they are faced with the tough decision can I keep these families, these individuals employed who their families are relying on this, and I got to make decisions, look at my bottom line, look at my fixed costs, look at everything else, they probably do see it as important. You may see it as not important and negligible, but they probably do. Let me ask you another question here.

Mr. Kucinich had the jobs created to retrofit and retool. And you pointed to that, too. But I guess I want to ask, this is the old basic economics principle opportunity costs. If you are not spending those dollars to retrofit and retool your facility, you are probably using them some other way, maybe to create jobs, maybe to do other things. So would you agree that while, sure, they are going to have to—there might be some jobs that are created to retool and refit, that is money that they could have used somewhere else but for the fact that you are making them retool and refit.

Mr. PERCIASEPE. Well, first, it creates jobs and permanent jobs, and second, it creates all those health benefits I just mentioned. It is hard to get that double benefit from other investments.

Mr. JORDAN. But you would also agree with the opportunity costs. When money is spent one place, it can't be spent someplace else.

Mr. PERCIASEPE. The cost-benefit ratio of this kind of expenditure is more than 5 to 1, 10 to 1. Small businesses who could in theory be impacted from small prices increase, this is such a small increase, that it could be well within their ability to make energy-efficiency controls.

Mr. JORDAN. Again, it is always easy for government to say that. It is much tougher for the individual or the family or the business owners that actually have to implement it.

Mr. PERCIASEPE. They would actually save money and be able to invest it in their business.

Mr. JORDAN. So wait a minute. So now you are saying increased energy costs are actually going to be a savings? How does that work?

Mr. PERCIASEPE. Well, if they implement certain very simple energy efficiency measures in their own business that most business people are looking at——

Mr. JORDAN. I am sure they are doing that if it makes sense on their own. They don't need the government to tell them that to do that.

Mr. PERCIASEPE. That is right. I am just saying that this is what normally would happen in the normal business world.

Mr. JORDAN. I didn't expect to take 5 minutes. I will be happy to yield back to the ranking member. I am good on time. I can go to you or I can go to the vice chair of the committee. Okay. I thank the gentleman. We will now yield to the vice chair of the committee, who is actually going to take over for the chairman. Thank you.

Ms. BUERKLE. Thank you, Mr. Chairman.

And I apologize for missing the first round of questions. Thank you for being here today and your willingness to testify. In your analysis for Utility MACT, you estimated that it could lead to pollution control-related capital investment of $45 billion to $50 billion and that this could create 35,000 jobs per year by 2015.

Mr. PERCIASEPE. I think our estimate is, it is about $10 billion, I am sorry, in our final rule. And our estimate is $10 billion, and our estimate is about 31,000 temporary jobs and about 9,000 permanent jobs.

I think I am right on that. I want to make sure.

Total annual cost is $10.9 billion. The annual benefits are about $59 billion to $140 billion. So it is a 5 to 1 cost-benefit ratio or 13 to 1 cost-benefit ratio. I think I have the job analysis right. I am sorry. I wanted to make sure I gave the numbers that we had there.

Ms. BUERKLE [presiding]. Okay. So you are saying——

Mr. PERCIASEPE. This could have been in the proposal. But I am happy to dig into this here for you, if I can.

Ms. BUERKLE. Well, if you would like to elaborate or explain, because that is the information we had. And you can see the cost per job——

Mr. PERCIASEPE. I see that.

Ms. BUERKLE [continuing]. Is ridiculous.

Mr. PERCIASEPE. I would like to be able to provide some information for you on that.

Ms. BUERKLE. Okay. Can you provide that information today, or would you like to provide it——

Mr. PERCIASEPE. I have to—I have to go look at the technical support document and see where—but what I just gave you are the numbers in the final proposal, $10.9 million—I am sorry, billion a year; 31,000 temporary jobs; 9,000 permanent jobs. Benefits of $50 billion to $100 billion, including 7,000 to 17,000 premature deaths avoided, 11,000 nonfatal heart attacks avoided. I am not going to read them all. But this is what was the in the final rule. The cost-benefit of this is about 5 to 1, or at the high end of the range 13 to 1.

Ms. BUERKLE. So what is your estimate that the cost is per job?

Mr. PERCIASEPE. The annual cost of the rule is $10.9 billion, with ultimately around 9,000 permanent jobs.

Ms. BUERKLE. What does that cost per job?

Mr. PERCIASEPE. Well, the purpose of the rule is to achieve 17—avoid premature deaths for 17,000 adults, 11,000 nonfatal heart attacks, 5,300 hospital admissions, 6,900 emergency room admissions, 4,500 cases of chronic bronchitis, 11,000 cases of acute bronchitis. Those are the things that we add as the benefit side.

Ms. BUERKLE. I understand all that. But if you are using it as a justification because it creates jobs, we have to look at the cost per job and say, does that even make sense?

Mr. PERCIASEPE. Well, we are looking at the benefits of all these health benefits.

Ms. BUERKLE. I want to get onto just a different topic here.

Recently, the EPA announced that it is going to reconsider the ozone NAAQS standards established in 2007. Can you explain or tell me why the EPA decided to review and actually on an expedited schedule? They are not really ready; the 2012 would be the appropriate time.

Mr. PERCIASEPE. The ozone standard was last proposed in 2008. And it was—there was litigation about it. And the standard that was proposed was outside the range of the Clean Air Act Scientific Advisory Committee that was set up by the Clean Air Act. We saw that as legally vulnerable, and so it was remanded back to EPA by the court back in that timeframe. We have been working on it ever since. We have proposed it, but we haven't yet finalized it. It is in agency review right now. But we haven't finalized the reconsideration of the ozone standard.

Ms. BUERKLE. Are you under court order to expedite the review?

Mr. PERCIASEPE. There is a stay on the litigation that eventually probably will be lifted by the judge. But right now, we are acting under a stay on the litigation, and with the understanding that we would propose it by the end of July. We have told the litigants as early as this week that we are not going to be able to make that July 29th deadline, and that we are still in the interagency review process. We are going to do it as soon as possible, but it is still going to take some time.

Ms. BUERKLE. My concern with that is that the environmentalists, rather than EPA and the appropriate branches of government, are establishing our environmental policy.

Mr. PERCIASEPE. Well, we were sued by all different litigants.

Ms. BUERKLE. My time has expired.

I yield 5 minutes to the ranking member, Mr. Kucinich.

Mr. KUCINICH. Thank you very much, Madam Chair.

Mr. Perciasepe, the House is currently debating H.R. 2584, an appropriations act that included a rider that blocks the EPA from implementing its rule to control air toxic emissions, as well as the Cross-State Air Pollution Rule, controlling interstate transportation of nitrogen oxides and particulate matter emissions from power plants.

Sir, if this legislation became law, what impact would it have on EPA's ability to fulfill its mandateunder the Clean Air Act and implement the air pollution rules covering pollution from power plants?

Mr. PERCIASEPE. Well, if you make the assumption that those riders would not allow us to spend funds in the budget on finishing the work under those rules, it will delay further—it has already been delayed almost a decade—the health benefits and the certainty that industry has said that they want.

Mr. KUCINICH. Can you quantify what those health benefits were?

Mr. PERCIASEPE. I just listed the ones for the—which I think is already in the record in the answer to the vice chair. I will get here in a minute from my able assistant the actual numbers for the—I probably have some of them.

Mr. KUCINICH. While your able assistant is gathering those numbers——

Mr. PERCIASEPE. From the Cross-State Air Pollution——

Mr. KUCINICH. Right. I would just like to go over those numbers. Here we go. Number, please.

Mr. PERCIASEPE. Thank you. It is 13,000 to 34,000 premature mortalities; 15,000 nonfatal heart attacks; 19,000 hospital emergency department visits; 19,000 acute bronchitis events; 420,000 upper and lower respiratory symptoms; 400,000 aggravated asthma; and 1.8 million days when people will miss work or school. Those are the benefits that will be delayed, along with the ones that——

Mr. KUCINICH. Is that delayed on an annual basis, or is that delayed on a 10-year basis, or what?

Mr. PERCIASEPE. Annual. Annual. Yes.

Mr. KUCINICH. Has EPA ever done a quantification of that in terms of the dollar cost to the economy then if people are sick? You know, it is expensive.

Mr. PERCIASEPE. Well, the monetized benefits from those annualized health benefits I just listed, and that was for the Cross-State Rule, are $120 billion to $280 billion a year.

Mr. KUCINICH. So what is the monetized cost to public health? So you are saying that that is the cost of the benefit if you have the rule and the rule goes into place; people's health is protected. And on the other side, if you don't have the rule, that represents a loss or a cost that is being absorbed by people in terms of an attack on their health. So in a way—and that is what you are saying, right?

Mr. PERCIASEPE. Yes.

Mr. KUCINICH. Okay. So let's look at it this way. I mean, this is the way I look at it anyway. If these rules don't go into place, $128 billion, is it, annually?

Mr. PERCIASEPE. That is the low end.

Mr. KUCINICH. The low end, $128 billion annually, is the cost in terms of human health. Or as you said, if it is correct that it is a benefit. But it is a cost now because the rules aren't in place. So these companies are making profits. And here is the point. If you have environmental conditions that are aggravating human health, and the EPA is trying to mitigate those conditions with a rule, and those conditions are not resolved and the industry keeps building their profit margins while having not to make any investments at all in cleaning up the environment so there wouldn't be these untoward health effects, what you actually have is a direct transfer of wealth in terms of the cost of human health from the mass of people to the utilities.

This, I think, is one of the underlying problems that I have with the fact that utilities refuse to abide by rules that protect human health. Because people pay for it. People actually subsidize the profits of the utilities with the public's health. So that $128 million—or billion ends up a payment that people make with their health. And in a sense, it is a transfer of wealth to the utilities. That is just not fair. It just isn't. And it is manifestly unjust. I find it morally offensive. And while I am with my colleagues in being concerned about jobs, look, how many people and their families have to spend so much of their time taking care of the illness of a loved one who may have their illness exacerbated because of air pollution?

I yield back.

Ms. BUERKLE. Thank you, Ranking Member Mr. Kucinich.

I have a couple more questions. And I just want to say something about what the ranking member just brought up. And I think, you know, I have spent my whole life in the health—I am a nurse. I was a health care attorney. So I am very concerned about health, public health. And I don't think anyone on either side of the aisle is saying we don't need regulations.

But what we need is reasonable regulations, regulations that encourage people to be entrepreneurial, encourage people to take a risk, not thinking that they will be beat down, and when they do comply with regulations that, you know, around the next corner, those regulations are changed, so then they have to retrofit and they have to recomply.

The cost of compliance, as I talk to small businesses throughout the district, it is exorbitant. And it really is a deterrent for people to take the risk and to go into business. So I think all we are talking about here and we are asking the EPA is to be reasonable, to understand that every one of those new regulations, every one of those regulations that get put into a book have an effect. They filter down to some poor small business owner whose bottom line and his profit margin is very slim. And one more change or one more law to comply with, or one more regulation may be what puts him over.

And I think that is more—and if we look at it that way, we are talking about public health, but we are also balancing it with a 9.2

unemployment rate in this country. We have to look at this thing in its entirety. You look like you wanted to comment.

Mr. PERCIASEPE. You know, those are very reasonable words. And I think we share the desire to make sure these rules are implemented in an appropriate way. We are trying to provide time in the rules, flexibility with trading, allowance trading. EPA has other flexibilities if things get tight on a reliability front.

The other side of the coin is also trying to make sure that there is a clear path. These rules have been lingering for a decade. And we are in this parallel universe of people saying we need certainty so we can make investments, but if we create the certainty, then there is too much that we think we might have to do.

And the truth of the matter is you need know where you—you need have that path of where to go, but at the same time, we need to have the flexibilities that are available in the Clean Air Act.

And I think this country can do it. It has been able to do it. GDP has gone up 205 percent since the Clean Air Act was enacted, while pollution has gone down almost 60—over 60 percent. These last increments are really going to pay dividends in public health. And we need to make sure we do use the flexibilities that are in the Clean Air Act.

Ms. BUERKLE. Thank you.

I only have 2 minutes left, so I have one more question here.

The Assistant Secretary of Energy James Wood stated that, number one, electric rates are going to go up. And I would like you to comment on that. I mean, do you agree with him that electric rates are going to go up? And I will enter Mr. Wood's article into the record, without any objection.

Mr. PERCIASEPE. Well, our regulatory impact analysis that we have done on let's just say these two rules indicate that electric rates will go up from a base that is lower than it was in the last decade. So the variability in the electric rates are going to be small compared to the variability of the electric rates we had before these rules were out there.

That said, when we do—when we did work on some of these rules, we definitely used the small business panels to help us look at the impact on small business, how the rule—how small business could accommodate the rule. So we have looked at those things as well. But there is a slight increase in the electric rates on an average across the country. And we have identified that in our regulatory impact. We are not hiding that fact. We are trying to put it in context.

Ms. BUERKLE. I don't mean to interrupt, but my time is clicking away here.

I will say your estimate came in the lowest of anyone's estimate as to what their electrical rates will do. And again, that goes back to jobs and job creation and small businesses. I mean, it may be a few pennies, but it may not be a few pennies. It may be more than that. And that may be the one single factor that pushes—either deters someone from going into business, the cost of doing business, or worse yet, it forces them out of business because they can't meet their bottom line.

With that, my time has expired.

We are going to do another round of questions.

I yield 5 minutes to the ranking member.

Mr. KUCINICH. Mr. Perciasepe, American Electric Power claims the cost of complying with the regulations affecting power plants will result in an increase in electricity prices of 10 to 35 percent. According to EPA's own regulatory impact analysis for the final Transport Rule, the agency's economic model suggests an average national price increase for energy is 0.16 percent, just a fraction of 1 percent.

Under the Toxics Rule, the agency's economic model suggests the average national price increase for energy is 0.8 percent. This is a long way off from 10 to 35 percent. Can you explain the discrepancy between AEP's figures and your own?

Mr. PERCIASEPE. I haven't studied how they came up with those estimates.

But I would say that EPA has been historically able to estimate impacts of our rules, and we are even conservative in our impacts on how we estimate our impacts on rules. So it could have been any number of things that they have included in their assumptions that we would have to look at.

Mr. KUCINICH. Well, why don't you obtain the information and get back to this subcommittee so that we can make an evaluation of their claim?

Thank you. I yield back.

Ms. BUERKLE. Thank you.

With that, we will all our second panel to the witness table. And thank you very much for being here today and for offering your testimony and your information to us.

Mr. PERCIASEPE. Thank you both, and thank the chairman.

Ms. BUERKLE. Good afternoon.

Thank you for being here. Our second panel consists of Ms. Janet Henry, who is the deputy general counsel for American Electric Power; Dr. Joel Schwartz, professor of environmental epidemiology, Harvard School of Public Health; and Mr. Mike Carey, president of the Ohio Coal Association.

Good afternoon and welcome to all of you. Pursuant to the rules of the Oversight and Government Reform Committee, if I could ask you to stand and please raise your right hands.

[Witnesses sworn.]

Ms. BUERKLE. Let the record reflect that the witnesses answered in the affirmative.

Thank you very much.

I would ask that each of our witnesses if you could limit your opening statements to 5 minutes. I know that the ranking member has an amendment to offer on the floor, and I would like to give him the opportunity to lead off the first round of questions before he has to leave.

So, Ms. Henry, if you would proceed, I would appreciate it.

STATEMENTS OF JANET HENRY, DEPUTY GENERAL COUNSEL, AMERICAN ELECTRIC POWER; JOEL SCHWARTZ, PROFESSOR OF ENVIRONMENTAL EPIDEMIOLOGY, HARVARD SCHOOL OF PUBLIC HEALTH; AND MIKE CAREY, PRESIDENT, OHIO COAL ASSOCIATION

STATEMENT OF JANET HENRY

Ms. HENRY. Thank you Vice Chairman Buerkle, Ranking Member Kucinich and members of the subcommittee. Thank you for giving me the opportunity to testify regarding the impacts of EPA's suite of new regulatory requirements for the public utility sector.

AEP is one of the Nation's largest generators with nearly 38,000 megawatts of generating capacity and serves more than 5 million retail customers in 11 States. We employ diverse kinds of generating of energy sources, including coal, nuclear, hydroelectric, natural gas, oil and wind power. But coal is important in our States, and approximately two-thirds of our generating capacity utilizes coal to generate electricity.

We believe that the current regulatory track being pursued by the EPA will have damaging impacts on our Nation's electricity system, as well as broader negative employment and economic implications. Together they will require very large capital utility investments on a very short timeframe.

AEP has already achieved substantial SO_{50} and NO_{120} reductions over the past two decades beginning with the acid rain program in the 1990's and continuing with the NO_{120} SIP Call in the Clean Air Interstate Rule. AEP's SO_{50} emissions have been reduced by over 1.1 million tons. That's about a 73 percent reduction in emissions. And our NO_{120} emissions have been reduced by 80 percent over that same time period.

In just the past 10 years, AEP has invested over $5 billion in emissions control equipment on our coal units to reduce SO_{50} and NO_{120} . About two-thirds of our fleet is currently equipped with the most efficient SO_{50} controls and about three-quarters of the fleet in the eastern system has the most advanced NO_{120} controls.

Two projects were completed in the last 18 months at our Amos power plant, and we are preparing to submit applications for regulatory approvals to install additional controls in Indiana. We expect this transformation to continue and our emissions to continue to decline.

We are committed to working with EPA in the development of future control requirements, but we have concerns about EPA's proposals. They include the infeasibility of the compliance deadlines. The Cross-State Air Pollution Rule will take effect in less than 6 months, and the reductions in several States required by 2012 represent more than a 30 percent reduction in emissions over 2010 emission levels. Multiple regulatory programs are going to be taking effect in a very compressed timeframe, resulting in unprecedented capital expenditures, mostly before 2015. There would be two to three times as much capital spent in the United States to comply with these new EPA rules by 2020 as has been spent over the past 20 years.

Abrupt and significant power plant retirements are likely to occur due to high costs and infeasible compliance deadlines. We ex-

pect that between 50 and 110 gigawatts of coal-fired generating capacity will retire due to the proposed EPA rules. And with those retirements come increased risks of unanticipated electric grid reliability problems, particularly during the 2014 to 2016 period.

The greatest capacity reductions are anticipated to occur in the PJM region, which recently experienced an all-time high peak, and the SERC region, which is in the southeastern portion of the country.

But both ERCOT and SPP have also expressed concerns about the localized effects on the electric grid. There will be very high electricity rate increases, as has been observed by the committee members, and significant job losses associated with the implementation of these rules.

According to a recent study by NERA, the Cross-State Rule and the Utility MACT rule will result in over 1.4 million net job losses in the United States.

There's a better way. We would like to see more holistic analysis of EPA's regulatory programs in an effort to coordinate the implementation of these requirements that can be phased in reasonably over a slightly more extended period of time and achieve the same environmental outcomes. That time will reduce the impact on our customers and the economy. Thank you.

[The prepared statement of Ms. Henry follows:]

WRITTEN TESTIMONY OF JANET HENRY
DEPUTY GENERAL COUNSEL
AMERICAN ELECTRIC POWER

BEFORE THE HOUSE SUBCOMMITTEE ON REGULATORY AFFAIRS, STIMULUS OVERSIGHT AND GOVERNMENT SPENDING
JULY 26, 2011

Chairman Jordan, Ranking member Kucinich, and members of the subcommittee, thank you for giving me the opportunity to testify today regarding the impacts of the suite of EPA regulations affecting the electric utility sector. AEP is one of the nation's largest electricity generators -- with nearly 38,000 Megawatts (MW) of generating capacity -- and serves more than five million retail consumers in 11 states in the Midwest and South Central regions of our nation. Our job each day is to ensure that our customers have access to reliable power at affordable prices. AEP's generating fleet employs diverse energy sources – including coal, nuclear, hydroelectric, natural gas, oil, and wind power. Due to the location of our service area and the historic importance of coal to the economies in our states, approximately two-thirds of our generating capacity utilizes coal to generate electricity. A combination of proposed and recently finalized regulations is aimed directly at our nation's fossil fuel-fired generating fleet, and imposes the greatest burdens on states with a high percentage of coal-fueled generation.

We believe that the current regulatory track being pursued by the Environmental Protection Agency (EPA) will have damaging impacts on our nation's electric system, as well as broader negative employment and economic implications. Together, the federal Cross-State Air Pollution Rule (CSAPR) – formerly known as the Transport Rule, the Utility Maximum Achievable Control Technology Rule (Utility MACT), the Clean Air Visibility Rule, the Coal Combustion Residuals Rule (CCR) as well as the Cooling Water Intake Structures Rule under section 316(b) of The Clean Water Act (316(b) rule) will require very large utility capital investments. CSAPR and the Utility MACT alone, according to EPA's own estimates, will impose massive costs within the next 3-4 years, the vast majority of which will be borne by coal-fired generators and their customers. This follows a decade when generators within these same areas have invested billions of dollars to achieve reductions of over 50 percent in

emissions of both SO_2 and NO_x and rates have already risen. For many coal-reliant states, the CSAPR will require additional substantial emission reductions starting in January of 2012. In many states, these represent reductions of over 30% below actual emissions in 2010. Further reductions are due to occur in 2014, the same year EPA proposes to make the Utility MACT effective for sources nationwide. There is simply not enough time to get regulatory approvals, design, permit, and construct scrubbers, SCRs or other major pollution control investments to achieve those levels of reductions. As a result, they will force a large number of premature power plant retirements where investments make no economic sense given the remaining useful life of the plants, or, where such investments are the most cost-effective compliance option, plants may have to be idled or significantly curtail production for two or more years in order to complete the necessary controls. These power plant operational outcomes raise significant policy, economic, and energy issues that Congress should carefully examine.

I am here to today to explain our analysis of the impacts of the new EPA regulations including electricity reliability, capital costs and electricity rate increases in AEP states for our customers. I will also describe the results from other studies that estimate related broader economic impacts, such as national and regional job losses, plant retirements and costs. In addition, I will offer some alternatives to lower these large and potentially very adverse impacts on electricity reliability, electricity and other energy prices, employment, and the overall U.S. economy by providing more time to achieve similar environmental outcomes.

AEP Has Already Achieved Substantial Emissions Reductions.

AEP has achieved very substantial SO_2 and NO_x reductions over the past two decades. Our efforts began with a series of cost-effective measures to cut SO_2 and NO_x emissions in the 1990's under the Acid Rain program, including installing scrubbers and NOx combustion controls, as well as blending lower sulfur coals into the fuel mix at plants that could accommodate such coals. The past decade has seen a continuation of this program to transform our fleet of coal-fired generating units. This transformation included the installation of state-of-the-art control technologies at many of our generating stations in order to meet the steep NO_x reduction requirements of the NO_x SIP Call in the early part of the decade. It has continued with a third wave of emissions controls being installed to achieve additional NO_x

and SO_2 reductions required under the Clean Air Interstate Rule (CAIR), which CSAPR would replace. As a result of these efforts, over the last 20 years, our annual SO_2 emissions have declined by **~1.1 million tons (a 73% reduction)** and our annual NO_x emissions have been reduced by **~450 thousand tons (an 80% reduction).**

In just the past ten years, AEP has invested over $5 billion in emissions control equipment on our coal units to reduce SO_2 and NO_x emissions and to comply with the NO_x SIP Call and CAIR programs. AEP has spent several additional billions of dollars on low sulfur fuel, chemical reagents, and other pollution control O&M costs. Most of these investments and the emission reductions have occurred in the Eastern portion of the AEP system. About 80% of AEP coal-fired capacity is located in AEP's Eastern footprint, which includes coal-fired plants in Virginia, West Virginia, Ohio, Kentucky, and Indiana. Annual SO_2 and NO_x emissions have been reduced at AEP plants in these states by 64% and 84%, respectively, in the last decade alone. About two-thirds of the AEP Eastern coal-fired fleet is now equipped with the most advanced SO_2 controls – that is, Flue Gas Desulfurization (FGD) which reduces SO_2 emissions by about 95%. Similarly, about three-quarters of the AEP Eastern coal-fired fleet is equipped with the most advanced NOx controls, that is, Selective Catalytic Reduction (SCR) which reduces NOx emissions by about 90%. Two projects were completed in the last 18 months at our Amos Plant, and we are preparing to submit applications for regulatory approvals to install additional controls in Indiana. All of these efforts have also been consistent with an agreement we signed in 2007 with EPA and other plaintiffs to settle an enforcement action under the New Source Review Provisions of the Clean Air Act. But EPA's new rules impose more obligations, sooner than required under that Consent Decree.

We expect this transformation of our coal fleet to continue in the coming decade. Two of our newer coal plants in our Western states were originally constructed with FGD controls, and we expect to reduce SO_2 and NO_x emissions further at units that are regulated under the Clean Air Visibility Rule in Arkansas and Oklahoma. CSAPR will impose additional obligations on our units in Texas, Arkansas, Oklahoma and Louisiana as well. EPA has indicated that additional requirements will be imposed to meet more stringent ozone or PM standards that are expected later this year.

The EPA Rules Threaten Electric Grid Reliability, Create Higher Unemployment, and Result in Much Higher Electricity Rates for States Reliant on Coal Fired Generation.

Although we are committed to working with EPA in the development of future control requirements under its proposed Utility MACT, CCR and 316(b) rules, the final Clean Air Visibility Rule, and the final Cross-State Air Pollution Rule, we have major concerns with these new EPA rules, including the following:

- **Infeasible Compliance Deadlines.** EPA is simply not providing sufficient time to design, permit, and install major emissions control technologies on large amounts of existing coal-fired capacity that are necessary to comply with EPA's Cross-State Air Pollution Rule (beginning in 2012, with more stringent limits in 2014), the proposed Utility MACT Rule (by the end of 2014 or by end of 2015) and the proposed Federal Visibility Rule in Oklahoma (end of 2014).

- **Multiple Major Regulatory Programs Resulting in Unprecedented Capital Expenditures, Mostly Before 2015**. There would be two to three times as much capital spent in the U.S. to comply with these new EPA rules by 2020, as compared to the amounts that were spent on all utility air pollution controls over the previous 20 years.

- **Abrupt and Significant Power Plant Retirements due to the Combination of the High Costs of Compliance and the Infeasible Deadlines.** Recent studies have suggested that between 50 and 110 GW of coal fired capacity will be forced to prematurely retire due to proposed EPA rules. The un-depreciated balances associated with these retirements will place greater pressures on utility rates and the impractical deadlines will increase the risk of stranded investments.

- **Unanticipated Electric Grid Reliability Problems Particularly during 2014-2016.** This impact is projected to occur due to the large number of premature retirements plus the substantial amount of idled capacity due to insufficient time to design, permit, and install major emissions controls as well as the wide-scale unit outages that are required to "tie-in" these major new emission controls. These greatest capacity

reductions will occur in the PJM region, a very large power pool which covers the Mid Atlantic states (NJ, PA, DE, MD), plus several states just to the west (including WV, OH, IN, MI and parts of IL) as well as in the SERC (i.e. Southeast Reliability Coordinating Council) region, which includes most of the Southeastern U.S., with additional localized reliability issues in these regions and ERCOT and SPP.

- **Very High Electricity Rate Increases Due to High Capital Costs of Compliance and New Replacement Capacity**. These rate increases will hit electricity intensive manufacturing in the Appalachian Region as well as other parts of the Midwest and Southeast particularly hard, leading to industrial plant shutdowns and substantial job losses. It will also be disproportionately borne by consumers in some of the poorest rural counties in these same states where there are many customers who are unemployed or on fixed incomes.

- **According to the NERA Study as well as Testimony of Other Economists, Over 1 Million Net Job Losses in the U.S.** A large portion of these losses will be borne by states and rural counties that are already experiencing much higher electricity rates due to previous environmental investments. Though there will be some temporary gains in employment due to construction of new pollution control and new gas-fired generation, these will be more than offset by (1) direct losses at shuttered coal-fired plants and related supply chain losses in mining and transportation; (2) reduction of industrial activity (and hence jobs) in these same states as higher electricity rates result in industrial plant shutdowns and output cuts; (3) indirect losses occurring as local supporting employment dwindles in the states and localities experiencing these losses; and (4) wide-scale job losses across the U.S. as consumers and business shouldering higher electricity rates cut back on consumption of other goods reducing GDP overall and jobs in a variety of industries.

The remainder of my testimony provides more detail on the costs, reliability and other serious impacts of the new EPA regulations as well as potential remedies for these problems.

There is Not Enough Time to Comply with EPA's New Rules for Controlling SO_2, NO_x, and HAP Emissions from Power Plants.

EPA's Cross-State Air Pollution Rule and Utility MACT Rule will require installation of a large amount of scrubbers and other capital intensive air emission controls. In particular, under the Cross-State Air Pollution Rule, the SO_2 caps become significantly more stringent in 2014 for more than two-thirds of the States covered under the SO_2 portion of the rule.[1] These States are ones most reliant on coal, and will bear the major portion of the compliance burden for limiting SO_2 emissions. The SO_2 budget limits in Eastern states, specifically states in the Appalachian Region, are equivalent to an average emission rate of approximately 0.20 to 0.30 lbs SO_2 per million Btu. Such very low emission rates can only be achieved at power plants burning Eastern bituminous coals by adding scrubbers. As such, these limits would require most all of AEP's coal-fired power plant units in these states to either install FGD, switch to natural gas or retire early in order to comply.

In addition to the massive SO_2 emission reductions required in 2014, the SO_2 and NO_x emission reductions slated for 2012 are very significant as well. These new emission requirements will be enforced less than 6 months from now, with little advanced notice, as the final requirements of the Cross-State Air Pollution Rule are significantly more stringent than those of the proposed Transport Rule. As an example, Ohio, Pennsylvania and Virginia are required respectively to make 46%, 30% and 24% reductions in SO_2 emissions versus 2010 levels by next year. Other states outside the Appalachian Region are also hit hard with stringent SO_2 reduction requirements. For example, Texas and Indiana are required to reduce by 2012 SO_2 emissions by 47% and 31% respectively, as compared to actual 2010 levels.

These "new" reduction requirements in just six months (first known with the issuance of the final rule just a few weeks ago) are particularly problematic because utilities are largely unable to make modifications to existing power plants in this time frame to substantially reduce emissions. Also, as most utilities procure most of their coal on a contractual basis well in advance, a major switch to lower sulfur coals is often not a realistic option. As a

[1] Specifically, 16 States, out of the 23 States covered under the Cross-State Air Pollution Control Rule program for SO_2, would be subject to more stringent SO_2 reduction requirements starting in 2014.

result, coal-fired power plants will likely have to be significantly curtailed or retired. Replacement electricity is likely to come in the form of more expensive gas-fired generation. Additionally, the replacement capacity might not be located in areas critical to transmission reliability, or able to provide voltage support or black start capability, creating further hardships and increasing the costs of maintaining the electric grid.

In addition to the Cross-State Air Pollution Rule, the proposed Utility MACT Rule requires compliance on a plant by plant basis with three separate emission limits (1) a very low mercury limit, (2) a PM limit (as a surrogate for non-mercury metals), and (3) a hydrogen chloride limit (as a surrogate for acid gases, or an optional stringent SO_2 limit as a surrogate at certain units). These limits will have to be met by the end of 2014 with a possible one-year extension allowed to the end of 2015. Based on a thorough review of these limits (and when combined with the requirements of CSAPR), we believe AEP will be required to retrofit scrubbers on most of the remaining Eastern fleet, and at a minimum, install a combination of baghouses, carbon injection and DSI (dry sorbent injection) for SO_2 removal at our plants in Texas, Arkansas and Oklahoma. For our Western fleet, some of these same units are affected by EPA's Clean Air Visibility Rule (CAVR), and thus could be required to retrofit scrubbers on the same or a slightly longer schedule.

Compliance with the final Cross-State Air Pollution Rule and proposed Utility MACT Rule, plus the existing Clean Air Visibility Rule, will effectively require AEP to install scrubbers at its unscrubbed units or retire the plants altogether, and to do so for virtually all of these plants by the end of 2014 (or perhaps the end of 2015 if a one year extension is granted). This allows between 2 ½ and 3 ½ years for compliance with at most 4 ½ years in a few cases. This time frame is completely infeasible to get regulatory approvals, design, permit, fabricate, and install a retrofit scrubber as shown in Figure 1 below:

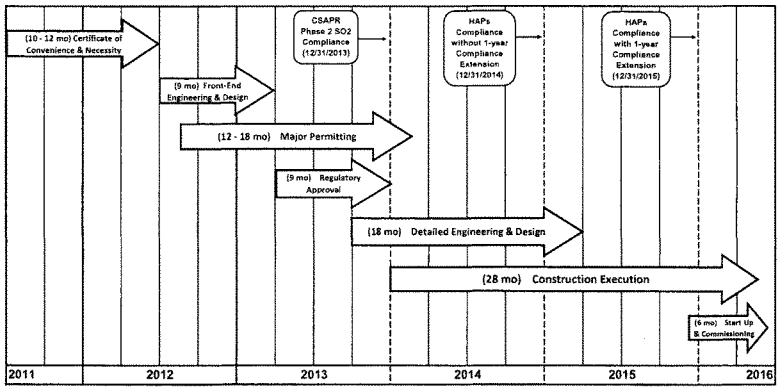


Figure 1

Figure 1 shows that the average time needed from project commencement to completion for a retrofit scrubber is five years for a regulated electric utility. (The time frame is similar if a unit is retired and replaced on site with a new combined cycle gas plant). This figure is based on the actual average time period needed during 2003-2010 when AEP added scrubbers at 7,800 MW of capacity or more installations than anyone else in the industry. Given that the EPA rules will require a greater number of retrofit projects and/or plant replacements and other related environmental investments across our industry within the same three to five year window, compliance with the Utility MACT Rule and Cross-State Air Pollution Rule is simply infeasible within this very short compliance period.

Capital Costs and Total Costs of Compliance with EPA's Rules are Unprecedented.

Because EPA is proposing several major rules all at once as well as scheduling compliance at the same time as other existing rules go into affect such as the Clean Air Visibility Rule, the level of additional capital investment required to meet all these rules is unprecedented:

- EEI, ICF and others have estimated that up to 227 GW of coal-fired capacity (approximately two-thirds of the U.S. coal-fired fleet) would have to comply by EITHER

making major environmental investments OR by prematurely retiring and replacing that capacity with new gas-fired capacity.

- Many of these coal units are smaller and older, with very high per unit costs to retrofit them. Older and smaller units often have poor economies of scale, space and design constraints and thus typically have a much greater retrofit cost and difficulty given that they were not originally designed for back-end pollution controls.

- AEP has estimated that its capital costs for compliance will be $6 - 8 billion with most of this being spent in just the next 5 years.

- ICF in an analysis conducted for the Edison Electric Institute (EEI) has estimated approximately $140-247 billion in additional capital costs associated with retrofitting or retiring and replacing coal units with most of this occurring in the next five years. This amount of incremental capital spending related to meeting EPA regulations is unprecedented in the electric utility industry. It is estimated to be about two to three times the environmental capital spent by the industry in the past 20 years.

- A study conducted by National Economic Research Associates (NERA) for the American Coalition for Clean Coal Electricity (ACCCE) estimated a similarly massive amount of incremental capital investment (approximately $124-168 billion) to comply with the less stringent proposed Clean Air Transport Rule (as compared to the final CSAPR) and proposed Utility MACT Rule. To develop these estimates, NERA used the federal government's major energy and environmental model the National Energy Modeling System (NEMS) model used by the U.S. Energy Information Administration (EIA) and employed the most recent EPA/EIA energy price and pollution control cost assumptions.

High Costs and Infeasible Deadlines Will Lead to Substantial Coal Plant Retirements and Significantly Compromise Electric Grid Reliability.

Due to the high costs of compliance and infeasible time deadlines, a large amount of coal unit retirements at AEP and across the industry is expected in 2014-15 time period. In addition, a

large number of units that are complying by retrofitting will have to be taken out of service, mothballed or significantly curtailed during the 2014-16 time period as well.

- About 78 GW of coal units are "older units" (greater than 45 years old in 2015) and 54 GW of these units are "smaller" (i.e. less than 300 MW unit size). Thus, at least 54 GW of coal units are very likely to retire because it will be uneconomic to retrofit these older, smaller units with only a limited useful life (10-15 years at most) over which to amortize these investments.

- AEP estimates that in its own coal fleet ~6 GW of its coal fired capacity (or about 25 percent of its coal capacity) would retire by the 2014-2015 time period under the EPA rules. We recognize that several of our units are also subject to the requirements of our New Source Consent Decree, but only 615 MW is required to comply with those requirements before 2015. Other major coal-fired utilities such as Southern Company and DTE Energy Company have estimated that a similar 20-30 percent of their coal fired capacity would retire in the period before 2015.

AEP also estimates that 1.5 – 5 GW of coal-fired capacity would be temporarily out of service or severely curtailed during 2014-16 as retrofit pollution controls are being completed.

Recent study estimates of U.S. retirements vary, with some being more credible than others. However, only a few studies looked at ALL of the major EPA rules in combination and also considered the potential effect of a CO_2 price (due to either future CO_2 regulations or legislation) on the retrofit/retirement decision at least in a sensitivity analysis. One study that looked at all or most of the major EPA rules and considered the possibility of CO_2 costs impacting the retirements was the ICF study conducted for EEI. Notably, the ICF study estimates between 46 and 101 GW of total coal unit retirements (~14 to 30 percent of total capacity). The upper end of the range includes CO_2 costs in the decision making; the lower end of the range is much more conservative and assumes no CO_2 costs. Other recent studies evaluating the impacts of multiple EPA rules also indicate substantial shutdown of existing coal-fired capacity.

- In an analysis of the proposed Transport Rule (which is less stringent than the final CSAPR) and the proposed Utility MACT Rule, the NERA study conducted for ACCCE estimates 53 GW of total coal plant retirements by 2016. This represents ~15% of U.S. coal capacity to be eliminated in only a five-year period.

- Credit Suisse has estimated between 35-100 GW of retirements, with a likely average of about 60 GW under EPA proposed Utility MACT and Transport rules.

By contrast, EPA has not evaluated the combined impacts of ALL of the new environmental regulations. The failure to evaluate the cumulative regulatory impacts of the new rules is one important reason why EPA has continually underestimated the amount of retirements in the U.S. in its various regulatory impact analyses (*e.g.*, in the Regulatory Impact Analyses for the proposed Utility MACT Rule, there is 15 GW of total retirements estimated by 2020). Another important reason is the faulty financial assumptions employed in the economic modeling analyses (*e.g.*, EPA assumes 30 years of financial amortization of investment instead of a more likely remaining life of 10-15 years for older units).

Given the high likelihood of a very large number of retirements as well as the reduced generation from other coal units during the 2014-16 period, there is a greatly increased risk that electric grid reliability could be seriously compromised in various regions of the United States. The most serious issues are expected in two of the largest reliability regions in the U.S. One is the ReliabilityFirst Corporation (RFC) region, which includes all or portions of the Appalachian Region states of PA, WV, OH, KY, WV and VA. The other is the Southeastern Reliability Corporation (SERC) region, which includes TN, AL, MS, GA and FL. Based on the ICF estimates about 17-41 GW is expected to be retired in SERC region (or 17-41% of coal fired capacity in the region) and about 16-29 GW in RFC region, (or 14-25% of coal capacity in that region). Additionally, many plants will be temporarily idled in these regions due to inability to install the necessary emission controls within the short compliance timelines of the EPA rules (*e.g.*, 2014-2016). It will not be feasible to replace all of this generating capability and/or the grid support functions currently supplied by that generation in the near term and hence there is a greatly increased risk that reliability may be compromised.

The exact effects on electric grid reliability are difficult to determine but SERC, PJM and North American Electric Reliability Corporation (NERC) with input from their member utilities are looking at this issue in light of the proposed EPA rules that were issued this spring. Updated studies are expected this fall. One important question is: Whether there will be enough capacity in the 2014-16 timeframe to meet peak demand with an adequate planning reserve margin (needed to ensure regional grid reliability in the event of significant unexpected outages and greater than expected peak demands)? Another question is: How quickly can new capacity be built to fill the void due to the retirements?

Not only is there concern about reliability in these two large NERC regions or power pools, but recent letters or statements from both the Southwestern Power Pool (SPP), which covers all or parts of Arkansas, Kansas, Louisiana, Missouri, Mississippi, Nebraska, New Mexico, Oklahoma and Texas) and the Electric Reliability Council of Texas (ERCOT) highlight additional concerns. In just the last week, the President and CEO of ERCOT noted in a written statement that "This is one of those cases where we believe it is our role to voice our concern that Texas could face a shortage of generation necessary to keep the lights on in Texas within a few years, if the EPA's Cross-State Rule is implemented as written."[2] In addition, the President and CEO of SPP, Nicholas Brown noted in a letter (along with an accompanying report) that "SPP is concerned that the timeframe for compliance with the proposed rules, should they be approved, may be more aggressive than what can be achieved by industry. Should this be the case it may adversely impact grid reliability due to the sudden retirements and outages at units."[3]

NERC, SERC and RFC must also consider the local grid stability and reliability issues, which are far more complicated. These reliability issues relate to the adequacy of the ancillary services that are necessary for load following, reactive power and voltage support, black start and system restoration to name a few. Many of these services are provided locally by AEP subcritical coal units into the RFC region. Many of these same units would retire by the end of 2014 under the EPA rules. They must be replaced with specific types of resources on site, or very nearby, in order to ensure that local grid reliability is not compromised (though in some cases these services may be replaced by further local transmission investment over

[2] Electric Reliability Council of Texas (ERCOT) Statement Regarding EPA Cross-State Air Pollution Rule
[3] Southwest Power Pool (SPP) letter to EPA, July 19 2011

the longer term). Many other retiring coal units at other utilities are providing similar services in their localities. This problem is complicated, requires careful planning, detailed electrical transmission system modeling and long lead times to replace capacity and equipment. **Unfortunately, the EPA rules do not provide adequate time to complete all of these tasks to ensure grid reliability.**

Very High Electricity Rate Increases Will Result Due to High Capital Costs of Compliance and New Replacement Capacity.

The new EPA rules, imposing stringent control requirements within the same short time-period, will result in an unprecedented amount of capital being deployed by the coal-fired electric sector on both environmental retrofits and replacement capacity. Recent studies have estimated that between $124-247 billion in additional capital costs will be incurred by the coal-fired electric sector, as a response to the new EPA rules.[4] Furthermore, these costs will likely occur over a very short (five-year) time period. This amount of deployed capital is more than two times the total capital invested in environmental capital over the past 20 years and will have significant impacts:

- According to the NERA analysis, these large capital costs along with significantly higher fuel and operating costs for electric utilities will increase the nationwide average retail electricity rate by 11.5% by 2016[5]. These rate increases will be much more pronounced (12% - 24%) for 24 states which rely most heavily on coal-fired electricity. (e.g. the Midwestern and Southern states).

- Much of the U.S. industrial and manufacturing base will be hit the hardest by the new EPA rules. Rural population centers, which already account for some of the highest national unemployment rates, will also face increasing economic distress due to much higher electricity rates.

- Natural gas prices could also see a spike due to the new EPA rules and the increasing reliance on gas fired generation units. Natural gas price increases could increase

[4] ACCE, NERA report "Economic Impacts of Proposed Transport Rule and Utility MACT Rule (June 2011).and EEI, ICF report "Potential Impacts of Environmental Regulation on the U.S. Generation Fleet (January 2011)
[5] NERA (2011)

further if optimistic projections of shale gas prove to be overstated or policy measures are taken which reduce supply.

Over One Million Net Job-Year Losses in the U.S.

The collection of new EPA rules on the electric power sector will have a significant negative impact on American workers. EPA has been quoted that "hundreds of thousands of jobs" will be "created over the next five years" due to the new environmental rules for the electric power sector.[6] However, EPA fails to quantify the lost jobs due to the premature shutdown of existing power plants, higher electricity prices, and other adverse impacts of the new environmental rules. In addition, EPA overlooks the fact that the added jobs attributed to the installation of pollution control equipment will be short-term construction jobs to comply with new rules, not long-term permanent jobs. When these other factors are considered in order to develop a broader economic picture, the economic reality of EPA's new rules is much different. **This is a critical conclusion of the NERA study, which projects 1.44 million NET job-years losses would occur between 2013 and 2020.**[7] States within the Appalachian Region face large, across-the-board net job-year losses, as shown in Figure 2. This negative employment impact of EPA's proposed rules is caused by several factors:

- Significant increases in electricity and natural gas prices will cause significant reductions in the amount of goods produced in many industries because of the higher costs to provide those goods and services. A decrease in production or output will result in job losses in affected industries.

- As electricity prices increase for the industrial, natural resources and manufacturing sectors, the prices for their products will increase. These price increases will likely be passed through to consumers in the form of more expensive goods and services, reducing real purchasing power. In addition, the industrial and manufacturing sectors, already facing significant international competition, will be at a further disadvantage and face reductions in both exports and domestic output. These

[6] "EPA's power plant rules would spur job creation – report" *(Greenwire, 02/08/2011)*
[7] NERA (2011). A loss of one job-year is equivalent to a loss of one job for a period of one year. Job-years are commonly used by economists, CBO, OMB and others in reporting employment statistics.

factors will all contribute to further job losses as industry and manufacturing are forced to lay-off workers.

Job Losses Due to EPA's Propose Transport and MACT Rule (Select Appalachian Region States)	
	Net Job Losses 2013 -2020 (Job-Years)
NORTH CAROLINA	47,000
OHIO	53,500
PENNSYLVANIA	59,000
VIRGINIA	50,000
WEST VIRGINIA	38,500
U.S. TOTAL	1.4 Million

Source: ACCCE/NERA Study (June 2011)

Figure 2

EPA May Impose Additional Requirements on an Accelerated Basis.

EPA has noted in the Cross-State Air Pollution Rule that it plans to use the rule as a template in future rulemakings to achieve revised fine particle and ozone standards. The ozone standard is being developed outside the normal process for revising the ambient standards and will greatly accelerate the imposition of new controls requirements if it is made more stringent. Moreover, the limited time frame between the release of the final CSAPR and the release of these new standards makes the investment planning process for the currently proposed and recently finalized rules inefficient and uncertain. The risk of stranded or unnecessary costs associated with marginal pollution controls or temporary reliability fixes increases dramatically. Such unpredictability also increases the probability that coal power plant units will be prematurely retired in order to avoid these investment and rate recovery risks. EPA should not revise the ozone standard outside the ordinary process for review of the ambient standards, and should coordinate its efforts to provide needed certainty for business.

There is A Better Way.

The combination of EPA's new rules for power plants will result in a series of relatively inflexible and stringent air pollution and other environmental regulations with infeasible timelines and unnecessarily high compliance costs. As already noted, in addition to high costs borne by our electricity customers, these new rules could also result in many premature plant retirements and over 1 million net jobs lost in the U.S.

We believe that a more holistic approach to energy and environmental policy is needed. AEP has been working closely with several labor unions to develop a new approach, including the International Brotherhood of Electrical Workers (IBEW); the United Mine Workers of America (UMWA); and the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers, and Helpers. A comprehensive analysis of the economic impacts of the proposed regulations as well as the feasibility and timing of their implementation is needed. While we continue to support sound policy aimed at improving air quality and public health, numerous economic studies and modeling analyses have demonstrated that the implementation of these major EPA requirements occurring in the same narrow time period will have major adverse economic repercussions. More time for phasing in the new control requirements is required to smooth the impacts associated with power plant closures and electricity rate increases, as well as to allow for the construction and installation of major environmental retrofit controls. Longer time frames would also enable better planning, ensure electricity grid reliability and avoid many premature plant shutdowns or excessively high costs for pollution controls due to supply constraints.

Given the multi-dimensional nature of major environmental policy initiatives, and the immediacy of the compliance deadlines, we believe that Congress must intervene and assure that a sensible multi-pollutant environmental program is developed on a rational schedule and that this schedule is coordinated with the other new EPA rules. We believe that a legislative approach can continue to promote the air quality and public health goals set forth in EPA's regulatory initiatives while ensuring that adequate emphasis is focused on the employment, economic and reliability impacts of the program.

Conclusion

In summary, American Electric Power recognizes that there are many regulatory drivers for additional emissions reductions and other environmental requirements from our coal-fired power plants and is actively planning to meet these new regulatory requirements. However, it is critical that any of the new EPA rules be structured in a way to allow for cost-effective implementation on a reasonable schedule so as to minimize the impacts on our residential customers, local businesses, and the reliability of the electricity grid. It is also critical that the emissions reduction levels of the program be set at levels that are technically feasible to achieve over the given time frame and are in fact necessary to fulfill the air quality goals and requirements of the Act. Moreover, it is important that such a program provide some measure of certainty over future compliance obligations, as AEP and other electric utilities continue the transformation of the electric generating fleet in this country. In their current form, the new EPA rules do not achieve these objectives.

Finally, AEP urges the Congress to consider adopting a multi-pollutant control program coordinated with the other new EPA rules that can achieve the anticipated emissions reductions from the electric power sector over the next decade in a manner that is consistent with all of these objectives. AEP believes that a coordinated approach will protect the environment, American workers (including labor unions and their members), local economies across the nation, and the American people.

AEP would like to thank the Committee for the opportunity to present the views of AEP on this important issue.

Ms. BUERKLE. Thank you, Ms. Henry.
Mr. Carey.

STATEMENT OF MIKE CAREY

Mr. CAREY. Chairman Jordan, Ranking Member Kucinich, members of the committee, good afternoon. Thank you for inviting me to testify today at this very important hearing.

The effects the EPA's pending and planned proposals will have on electricity prices, employers, domestic workers will be devastating. My name is Mike Carey. I am president of the Ohio Coal Association. We are an association that provides a voice for the many thousands of citizens working in Ohio's coal sector. Cheap affordable coal is what powers the manufacturing base and maintains our families across the Midwest and other regions of America.

The companies we represent, both large and small, are proud to directly employ over 3,000 individuals as well as the 30,000 additional secondary jobs that depend on our sector. These jobs and hundreds of more or thousands more are at risk directly because of the decisions under way by the EPA.

In particular, it is my hope that this committee will undertake a serious review of the work being conducted by the EPA as it relates to the following proposals: The Cross-State Air Pollution Rule, formerly known as the Clean Air Transport Rule; the Air Toxic Standards for Utilities or Utility MACT; the New Source Performance Standard Changes, the New Ozone Particular Matter Standards; Regulation for Coal Combustion Residuals; and the Power Plant Cooling Water Intake Structure Rule.

Members of this body have probably heard this grouping of proposals called the EPA Train Wreck. The regulatory wave embodied in these new mandates and rules above stands to cause great harm not only to Ohio but to the rest of the American economy. Today coal is mined in over 27 States across the Nation and is consumed in over 48 as reliable and affordable power.

I will focus my time today on the two most harmful EPA proposals. The first the Cross-State Air Pollution Rule. The underlying assumption of this proposal, Mr. Chairman, is that our customers, the electric utilities, like American Electric Power, like First Energy and Duke Energy, will simply move to a lower sulfur content coal. That assumes that companies will even continue to use coal in the first place. They could fuel switch to natural gas. This ultimately could disrupt the natural gas markets.

This administration proposes to sacrifice these 33,000 primary and secondary jobs that we create, and that is as simple as it gets. EPA's complex rule creates a system of allowances and trading that is much less flexible than the current regulatory framework. Winners and losers are thus clearly chosen, and Ohio is a loser. The only option for those producing electricity in our state, as we have already seen in many cases, is to shut down or potentially shut down their plants.

The second most harmful proposal in our view is the Utility MACT Rule. When the proposals are both finalized the national and regional impacts will be devastating. Ohio alone will lose 53,000 jobs, and electricity prices could certainly spur and hurt the middle and lower class Americans, which already pay almost 16 to

22 percent of their annual after-tax income on energy costs annually.

The future of Midwestern jobs and access to affordable energy depends on demanding that the EPA examine the cumulative impacts of their regulatory proposals. Oversight for how these flawed proposals are costly, unworkable and harmful to the U.S. economy should continue. In the interim, Congress must seek to enact policies that address the flaws in the EPA's proposals that I have outlined.

EPA's war on coal will also be harmful to the homeowners across the country. As the studies have shown, in the Train Wreck will result in electricity prices that would increase 13 percent in Ohio, 23 percent in Tennessee and 17 percent in Pennsylvania. Now, I understand that this week the House will take up the spending measures that will reduce the EPA's funding by 18 percent. My concern is that the EPA will simply find a way to shuffle around the funds, and such a cut will not stop their plans to move forward with the Train Wreck.

It is the belief of the Ohio Coal Association that Congress must be bolder, delay these rules immediately. It is critical, and the House must then act to write legislation that makes these rules more reasonable. Without a clear direction from Congress in this fashion, EPA will continue its toward pace of piling on new job crushing policies. I want to thank you for the opportunity to testify, and I stand ready to answer any questions the committee may have.

[The prepared statement of Mr. Carey follows:]

Testimony of Mr. Mike Carey

President, Ohio Coal Association

Before the

House Committee on Oversight and Government Reform,

Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending

Hearing Entitled: "*Lights Out: How EPA Regulations Threaten Affordable Power and Job Creation*"

July 26, 2011

Chairman Jordan, Ranking Member Kucinich, Members of the Committee, good afternoon.

Thank you for inviting me to testify today at this very important hearing regarding the effects of the planned rules and regulations being put forth by the U.S. Environmental Protection Agency (EPA). The effects these proposals will have on electricity prices, employers, and domestic workers will be devastating. My name is Mike Carey, and I am President of the Ohio Coal Association. I also have the pleasure of serving on the National Coal Council, which is an advisory committee to the Secretary of Energy on energy resource issues.

The Ohio Coal Association ("OCA") provides a voice for the many thousands of citizens working in Ohio's coal sector. We continually seek to educate state and federal lawmakers on the effects that their policies have in keeping Ohio and the rest of our Country competitive with foreign nations in the areas of low cost energy resources, reliable electric power production, and global manufacturing competitiveness. Cheap, affordable coal is what powers the manufacturing base and maintains our families across the Midwest and in other regions of America.

The companies we represent, both large and small, are proud to directly employ over 3,000 individuals in Ohio alone, as well as an additional 30,000 secondary jobs that depend on this sector. These jobs and hundreds of thousands more are at risk directly because of decisions underway at EPA. In particular, it is my hope that the Committee will undertake a serious review of the work being conducted by EPA as it relates to the following proposals:

- The Cross-State Air Pollution Rule, formerly known as the Clean Air Transport Rule;
- The Air Toxics Standards for Utilities, or Utility MACT;
- New Source Performance Standards changes;

- New Ozone and Particulate Matter Standards;
- Regulation of Coal Combustion Residuals; and,
- The Power Plant Cooling Water Intake Structures Rule.

Members of this body have probably heard this grouping of proposals called the EPA Train Wreck. The regulatory wave embodied in the new mandates and rules above stands to cause great harm not only to the state of Ohio, but the entire U.S. economy. Today, coal is mined in our country in 27 states and is consumed to produce affordable electricity in 48 states. EPA's rules are designed to force this product overseas to our competitors while our residents and businesses get stuck with massive price increases as we seek to replace this abundant energy resource.

Recognizing my time is limited today, I'm going to focus on what the Ohio Coal Association sees as the two most harmful EPA proposals to our region and our jobs. First, the Cross-State Air Pollution Rule. This formal, 1,300 page proposal was released by EPA just three weeks ago. We are finally able to see what the direct impacts will be of this rule, and it's devastating to Ohio.

The underlying assumption of this proposal, Mr. Chairman, is that our customers, electric utilities like American Electric Power that is here today, will simply move to a lower sulfur-content type of coal. That assumes companies won't just abandon coal altogether and fuel-switch to natural gas, causing price spikes for manufacturers and other who use natural gas in their industrial processes. To be clear, this Rule is a direct hit on Ohio because the coal that the thousands of men and women we represent mine every day has a higher sulfur content than other forms of coal. The Administration proposes to sacrifice these 33,000 primary and secondary jobs we create and support - it's as simple as that.

Another one of our coal's unique qualities is that it has a higher heat content, which means it gives off relatively less CO_2 when it's burned. I certainly find it ironic that EPA is trying to create a playing field where power providers are given an incentive NOT to use a fuel that has lower CO_2 emissions per unit.

EPA's complex rule creates a system of allowances and trading that is much less flexible than the current regulatory framework. Winners and losers are thus clearly chosen, and Ohio loses. Our state will lose up to 33% of our allocations; all while power providers are expected to reduce certain emissions targets by 46%, starting in six short months. The only option for those producing electricity is to shut down their plants.

The second most harmful proposal, in our view, is the Utility MACT rule. This will become final in the next few months, and will combine with the Transport Rule to further hurt similar regions of our country. When these proposals are both finalized, the national and regional impacts are devastating; Ohio alone will see 53,000 jobs lost and electricity price spikes sure to

hurt middle and lower income Americans. They already pay anywhere from 16-22% on their after-tax income just on energy costs annually.

Simply put, Appalachia is ground zero for the Obama Administration's efforts to put a regulatory stranglehold on local job creators. We have new rules that are changing the playing field to the detriment of economic development, and the mandates are all part of campaign promises the Administration made during the last election.

The future of Midwestern jobs and access to affordable energy depends on demanding EPA examine the cumulative impacts of their regulatory proposals. Oversight for how these flawed proposals are costly, unworkable, and harmful to the U.S. economy should continue. In the interim, Congress must seek to enact policies that address the flaws in the EPA proposals I outlined earlier, and in particular the Cross State Air Pollution Rule and the Utility MACT rule.

These serious issues affect the members of the Ohio Coal Association as well as the other domestic businesses producing critical energy resources across the country. EPA's war on coal will also be directly harmful to homeowners across the country, as parts of the Train Wreck will see electricity price increases of 13% in Ohio, 23% in Tennessee, and 17% in Pennsylvania. These are just a few of the states represented by Members on this Committee.

I understand that this week the House will take up a spending measure that will reduce EPA's funding by 18%. My concern is that EPA will simply find a way to shuffle around funds and such a cut will not stop their plans to march forward with the Train Wreck. It is the belief of the Ohio Coal Association that Congress must be bolder. Delaying these rules immediately is critical, and the House must then act to write legislation that makes these rules more reasonable. Without clear direction from Congress in this fashion, EPA will continue its torrid pace of piling on new job-crushing policies.

The current Administration is using EPA and other agencies to stop the use of affordable energy at every turn. Their actions are leaving investment dollars on the sidelines due to uncertainty. They have ground the permit process to a halt. New regulations on power plants are making it costly and impractical to burn coal to provide electricity. It's all-out effort to stop the ability to access coal, and where they can't do that with a straight face, they will look to eliminate all of our customers. Apparently EPA believes they can control the laws of both supply and demand, all to the detriment of our economy.

Thank you for this opportunity to testify, Mr. Chairman, and stand ready to answer any questions the committee may have about this blatant attack on coal jobs, power providers, and businesses small and large throughout the Midwestern United States.

Ms. BUERKLE. Thank you, Mr. Carey.
Dr. Schwartz, if you would proceed.

STATEMENT OF JOEL SCHWARTZ

Mr. SCHWARTZ. Thank you, Madam Chairman, Mr. Kucinich.

Certainly the regulations that we have heard about, like the Transport Rule, will impose significant costs on industry, but they will also produce significant health benefits, and I would like to talk a bit about that.

Particulate matter is one of the largest avoidable causes of death in the United States. To put that in perspective, particulate matter kills more people each year in the United States than AIDS, breast cancer and prostate cancer put together. That is a big number. And the difference is we don't know how to cure AIDS, breast cancer and prostate cancer, but we do know how to put scrubbers on coal-burning power plants. And so it is important to think about it in that respect.

And this is not just my opinion, this is a worldwide scientific consensus. In 2005, the World Health Organization said that particulate matter killed 800,000 people a year in the world's cities alone. The American Medical Association has endorsed these conclusions, as has the American Thoracic Society, the American Cancer Society, the American Heart Association.

The Clean Air Scientific Advisory Committee has extensively reviewed EPA's science assessment for particles over the last several years and concluded that the association with mortality was causal, that the risk assessment was sound, except they said that what EPA cited as their high estimate was actually a mid-range estimate because there were lots of studies that showed bigger effects. The National Academy of Sciences in the United States has endorsed this conclusion in two separate reports.

In 2005, the European Union proposed the strategy to reduce particles because their scientific review concluded it killed a lot of people, and their strategy was to impose an 82 percent reduction in SO_{50} emissions, primarily by retrofitting scrubbers on coal-burning power plants.

So this is really a consensus view of the worldwide scientific community. And the reasons they believe that are simple. We have lots of studies in the scientific literature to support this. We have studies that compare death rates in more polluted towns and less polluted towns, and they are higher in more polluted towns.

We have studies that have looked at changes in particle concentrations in cities and changes in their death rates. And the more the particle concentrations drop, the more the death rates drop in those locations. We have studies that have then said, well, let's forget about those downward trends and let's look at just year-to-year fluctuations around the downward trend in particles, and year-to-year fluctuations in death rates went with those changes in particles. We have studies that looked at strikes and found that death rates fell when major industries that were important sources of air pollution were shut down, and went back up when they were turned on again.

And then buttressing all of this we have studies from animals that show that if you expose animals over a period of months to

particles compared to filtered air, that they develop much more atherosclerosis and the atherosclerotic plaques become much less stable and more likely to rupture, and it has been done in multiple studies. We have animal studies showing that if you produce ischemia in animals and expose them to particles, the blood flow to the heart is reduced further compared to one's breathing filtered air. We have studies showing that you can produce arrhythmias in animals by exposing them to particles.

So, in addition to all of the human studies, we have a great deal of toxicology that backs this up. And this is why review committee after review committee and scientific body and medical body after medical body have all come to the conclusion that this is really happening. And the numbers that we are talking about are quite large. So the mid-range number from EPA's expert elicitation or from what Case Act said, says that the Transport Rule will save 34,000 early deaths per year. That is a really big deal. And yes, it costs money, but actually, the cost per life saved is about $100,000 a life, and that is actually pretty cheap among public health interventions that are available to us.

So I think that these are important issues, but it is important to realize that there are very important public health benefits that will result from putting these controls on. Thank you.

[The prepared statement of Mr. Schwartz follows:]

Testimony of Joel Schwartz Professor of Environmental Health and Epidemiology, Harvard School of

Public Health and Director, Harvard Center for Risk Analysis Before the Subcommittee on Regulatory Affairs, Stimulus Oversight, and

Government SpendingCommittee on Oversight & Government Reform July 26, 2011

Qualifications

I am a Professor in the Departments of Environmental Health and Epidemiology at the Harvard School of Public Health, in the Department of Medicine at Harvard Medical School, Director of the Harvard Center for Risk Analysis, member of the faculty of the Environmental Biostatistics program, of the Cardiovascular Epidemiology program, and on the Steering Committee of the Harvard University Center for the Environment. I am also a former member of the Board of Councilors of the International Society for Environmental Epidemiology, and the Editorial Board of the American Journal of Respiratory and Critical Care Medicine. I have served on two National Academy of Sciences panels, and was a recipient of a John D. and Catherine T. MacArthur Fellowship. I am the most cited author in the field of air pollution research. I have over 454 peer-reviewed papers published or in press, which have been cited over 23,000 times in other peer-reviewed publications.

Testimony

There is clear, convincing evidence that this particulate air pollution is not merely a nuisance darkening our skies. It kills people. And the number of people it kills each year in the United States is not small—it is larger than the number of deaths each year from AIDS, breast cancer, and prostate cancer put together. The difference is we do not know how to cure AIDS, breast cancer, or prostate cancer. But we do know how to dramatically reduce those particle levels. In particular, the technology to control particle-forming emissions from coal burning power plants has been commercially available since the 1970's. Over half the power plants in the U.S. already use this technology, but other plants have delayed installing it for decades. The Clean Air Transport Rule addresses the emissions from those plants, and will save **tens of thousands of lives per year.**

Another comparison that puts the rule in perspective is that in 2001, more people in New York City died from particulate air pollution than from the attack on the World Trade Center on September 11. And the largest single source of those particles was emissions from coal burning power plants.

In addition to killing people, particles trigger heart attacks, destabilize people with heart failure, driving them into the hospital, and exacerbate respiratory infections, leading to increased hospital admissions for those conditions.

THE SCIENTIFIC CONSENSUS

This conclusion is not just mine; it is the overwhelming consensus of the scientific and medical community. It is widely accepted that particles reduce life expectancy, trigger heart attacks, and have a wide range of other adverse effects on health, and that sufficient evidence exists to quantitatively estimate the impacts of reducing air pollution on avoided deaths, etc. Several of the most reputed health organizations have noted the consensus on the health effects of particulate matter. For example, the World Health Organization, in setting a global maximum PM_{10} standard of 20 $\mu g/m^3$ in 2005, roughly equivalent to the U.S. EPA standard of 15 $\mu g/m^3$ for $PM_{2.5}$, stated:

> By reducing particulate matter pollution from 70 to 20 micrograms percubic metre as set out in the new Guidelines, we estimate that we can cut deaths by around 15%," said Dr. Maria Neira, WHO Director of Public Health and the Environment. "By reducing air pollution levels, we can help countries to reduce the global burden of disease fromrespiratory infections, heart disease, and lung cancer which they otherwise would be facing.

Their press release went on to say:

> These new guidelines have been established after a worldwideconsultation with more than 80 leading scientists and are based on review of thousands of recent studies from all regions of the world. As such, they present the most widely agreed and up-to-date assessment of health effects of air pollution, recommending targets for air quality at which the health risks are significantly reduced. We look forward to working with all countries to ensure these Guidelines become part of national law

and,

"For example, in the European Union, the smallest particulate matter alone ($PM_{2.5}$) causes an estimated loss of statistical life expectancy of 8.6 months for the average European."

Hence the WHO concluded not merely that the association of particles with early deaths is causal, but that the evidence is strong enough to allow quantitative estimates of the mortality benefits of reducing particle concentrations. Earlier, in the 2002 World Health Report, WHO concluded "Particulate air pollution (i.e. particles small enough to be inhaled into the lung) is consistently and independently related

to the most serious [acute and chronic health] effects, including lung cancer and other cardiopulmonary mortality."

In 2005 the European Union, after its own detailed evaluation of the scientific evidence, set standards for particulate air pollution, and developed strategies to reduce particle levels. In EU Clean Air For Europe (COM(2005) 446 final Communication From The Commission to the Council and the European Parliament) they state that the goal of the strategy is a "47% reduction in loss of life expectancy as a result of exposure to particulate matter; **To achieve these objectives, SO2 emissions will need to decrease by 82%**." That is, they concluded SO2 emissions from coal burning power plants were responsible for substantial loss of life, and embarked in

2005 on the pollution control policies the EPA is only now proposing to start

in 2012.

As part of the Clean Air Act, the U.S. EPA is required to regularly review the evidence on the health effects of criteria air pollutants, and have its summary review of the science about each pollutant reviewed by an external, statutory Clean Air Science Advisory Board (CASAC). In reviewing the EPA Staff Paper in 2006 the CASAC stated, "In summary, the epidemiologic evidence, supported by emerging mechanistic understanding, indicates adverse effects of $PM_{2.5}$ at current annual average levels below 15 $\mu g/m^3$." In its letter of 6/29/06, CASAC reiterated:

> The CASAC recommended changes in the annual fine-particlestandard because *there is clear and convincing scientific evidence that significant adverse human-health effects occur in response to short-term and chronic particulate matter exposures at and below 15 µg/m3, the level of the current annual $PM_{2.5}$ standard.*
>
> It goes on to say:
>
> > Significantly, we wish to point out that the CASAC'srecommendations were consistent with the mainstream scientific advice that EPA received from virtually every major medical association and public health organization that provided their input to the Agency, including the American Medical Association, the American Thoracic Society, the American Lung Association, the American Academy of Pediatrics, the American College of Cardiology, the American Heart Association, the American Cancer Society, the American Public HealthAssociation, and the National Association of Local Boards of Health. Indeed, to our

> knowledge there is no science, medical or public health group that disagrees with this very important aspect of the CASAC's recommendations. EPA's recent "expert elicitation" study (Expanded Expert Judgment Assessment ofthe Concentration-Response Relationship Between $PM_{2.5}$ Exposure and Mortality, September 21, 2006) only lends additional support to our conclusions concerning the adverse human health effects of $PM_{2.5}$.

As noted above, these conclusions are supported by all the major associations of health professionals, which include as members almost all researchers on heart disease, lung disease, and cancer. In their letter to the EPA administrator on the $PM_{2.5}$ standard the health professional organizations stated:

> There is a robust and growing body of evidence linking PM to adverse health effects. PM has now been linked to a broad range of adverse health effects, both respiratory and cardiovascular, in epidemiological and toxicological research. Epidemiological research has shown an association between PM exposure and increased risk for mortality. Time-series studies reported in the early 1990s showed that day-to-day variation in PM concentration was associated with mortality counts. These studies in selected cities have now been followed by national-level time-series analyses in the United States and Europe that pool data from broad regions to produce national estimates of the effect of PM on daily mortality.
>
> For example, in 90 U.S. cities, the National Morbidity and Mortality Air Pollution Study (NMMAPS) estimated a 0.2% increase of all-cause mortality per 10 $\mu g/m^3$ increase in PM_{10}. Risk was highest in thenortheast and for cardiovascular and respiratory causes of death. Findings of follow-up studies, including most notably the Harvard Six Cities Study and the American Cancer Society's Cancer Prevention (CPS) II Study, show that the resulting loss of life may be substantial. The time-series studies show a linear relationship between PM concentration and risk at concentrations measured routinely in many
> U.S. cities.
>
> There is a now a substantial, parallel literature on PM and morbidity. Studies have addressed PM and risk for hospitalization and other clinical outcomes and pre-clinical biomarkers. Since the 1997 PM NAAQS, there has been an explosion of research on cardiovascular consequences of exposure to PM indicating short-term and long-term effects of PM on cardiovascular health. A recent study, that includes data from over 11 million Medicare beneficiaries, shows that even small increases in exposure to PM results in increased admissions for cardiac and respiratory conditions, including heart and vascular diseases, heart failure, chronic obstructive

pulmonary disease and respiratory infections. The effect was even greater in participants over 75 years old, in terms of heart problems and COPD than participants 65 – 74 years old. In short, a significant body of research has described potential mechanisms for and the range of health effects caused by PM air pollution. The undersign physician organizations find the body of scientific evidence to be rigorous, comprehensive and compelling enough to justify a significant tightening of the existing NAAQS PM standards. Sincerely,

American Thoracic Society

American Academy of Pediatrics

American College of Cardiology

American Association of Cardiovascular and Pulmonary Rehabilitation

National Association for the Medical Direction of Respiratory Care

In separate comments, the *American Medical Association* wrote:

The new evidence on harmful effects of PM is substantial. PM has been linked to a broad range of adverse health effects, both respiratory and cardiovascular, in epidemiologic and toxicologic research. Studies of daily variation in concentrations and national level time-series analyses have linked PM with increased morbidity and mortality. Many U.S. and Canadian studies are available that provide evidence of associations between $PM_{2.5}$ and serious health effects in areas with air quality at andabove the level of the 1997 annual standard (15 μg/m3). Newer short term mortality studies provide evidence of statistically significant associations with $PM_{2.5}$ in areas with long-term average concentrations of 13 to 14 $\mu g/m^3$, concentrations that are below the 1997 standard. Short-term studies of emergency room visits and cardiovascular mortality suggest measurable health effects at $PM_{2.5}$ concentrations of ~12 $\mu g/m^3$. A recent study (Dominici F, Peng D, Bell ML et al. *JAMA*; 2006; 295:1127-1134) showed that $PM_{2.5}$ concentrations are associated with short-term increases in hospital admissions for cardiovascular and respiratory diseases among Medicare enrollees, arguing for setting a $PM_{2.5}$ standard that is adequate to protect the health of theseindividuals. The AMA supports the recommendations of EPA staff and the Clean Air Scientific Advisory Committee to EPA for more stringent air quality standards. In fact, several physician organizations, including the American Thoracic Society, American College of Cardiology, American College of Preventive Medicine, and the American Academy of Pediatrics, support a more stringent $PM_{2.5}$ standard of 12 $\mu g/m^3$ for the average annual standard; 25 $\mu g/m^3$ for the 24-hour standard; and use of the 99th percentile form for compliance determination. The AMA believes the Administrator should adopt these more stringent standards in order to provide adequate protection for the public from the adverse health effects of both long- and short-term exposures to fine particulate matter in the ambient air.

Hence by 2006 every major scientific body involved in either research or the evaluation of research relating to particulate air pollution has concluded that it is a major health hazard, whose consequences include early deaths.

Since 2006, the evidence has become even more convincing. The American Heart Association recently appointed a panel of scientific experts to review the new evidence on the risk posed by particles. That review was published in 2010 in Circulation, the world's leading peer reviewed journal on heart disease. The abstract of that peer-reviewed paper summarizes the conclusions as follows:

> In 2004, the first American Heart Association scientific statement on "Air Pollution and Cardiovascular Disease" concluded that exposure toparticulate matter (PM) air pollution contributes to cardiovascular morbidity and mortality. In the interim, numerous studies have expanded our understanding of this association and further elucidated the physiological and molecular mechanisms involved. The mainobjective of this updated American Heart Association scientific statement is to provide a comprehensive review of the new evidence linking PM exposure with cardiovascular disease, with a specific focus on highlighting the clinical implications for researchers and healthcare providers. The writing group also sought to provide expert consensus opinions on many aspects of the current state of science and updated suggestions for areas of future research. On the basis of the findings of this review, several new conclusions were reached, including the following: Exposure to PM <2.5 μm in diameter (PM2.5) over a few hours to weeks can trigger cardiovascular disease–related mortality and nonfatal events; longer-term exposure (eg, a few years) increasesthe risk for cardiovascular mortality to an even greater extent than exposures over a few days and reduces life expectancy within more highly exposed segments of the population by several months to a few years; reductions in PM levels are associated with decreases in cardiovascular mortality within a time frame as short as a few years; and many credible pathological mechanisms have been elucidated that lend biological plausibility to these findings. It is the opinion of the writing group that the overall evidence is consistent with a causal relationship between PM2.5 exposure and cardiovascular morbidityand mortality. This body of evidence has grown and been strengthened substantially since the first American Heart Association scientific statement was published. Finally, PM2.5 exposure is deemed a modifiable factor that contributes to cardiovascular morbidity and mortality.

> After extensive scientific review by the CASAC, the US EPA in 2009 published their new Integrated Science Assessment summarizing the state of the science about particulate air pollution. This new ISA was particularly focused on examining the evidence for causality of the relation of particles with various health effects, and drawing scientific consensus conclusions about that evidence. It is useful to summarize the rigorous and extensive review this process entails. The process begins with EPA using internal scientists and contracting with external, university scientists to write chapter of an Integrated Science Assessment (ISA), which summarizes the state of the science about the air pollutant, in our case particles. Draft chapters are sent out to review by other external scientists, and discussed at public meetings with CASAC, where others are encouraged to provide comments. Based on the review by CASAC, EPA has the ISA revised, and brings it back for a second review. This process continues until the CASAC is satisfied, and approves the ISA, and its conclusions.

EPA then drafts a Risk Assessment and a Policy Document. The Risk Assessment's goal is to quantify risk to the extent consistent with the CASAC review of the ISA. This risk assessment is then put through the same review protocol as the ISA, and must be approved by CASAC to be used. The Policy Document, which summarizes the policy relevant science the in implications for potential standards, likewise goes through the same process. The ISA, as approved by the external Clean Air Scientific Advisory Board states:

> Epidemiologic studies that examined the effect of PM2.5 on cardiovascular emergency department (ED) visits and hospitaladmissions (HA) reported consistent positive associations (predominantly for ischemic heart disease [IHD] and congestive heart failure [CHF]), with the majority reporting increases ranging from 0.5 to3.4% per 10 $\mu g/m^3$ increase in PM2.5. These effects were observed in study locations with mean1 24-h avg PM2.5 concentrations ranging from 7-18 $\mu g/m^3$ (Section 6.2.10), with effects becoming more precise and consistently positive in locations with mean PM2.5 concentrations of 13 $\mu g/m^3$ and above (Figure 2-1). Toxicological studies have provided biologically plausible mechanisms (e.g., increased right ventricular pressure and diminished cardiac contractility) for the associations observed between PM2.5 and CHF in epidemiologic studies. (p2-14)

and:

> There is also a growing body of evidence from controlled human exposure and toxicological studies demonstrating PM2.5-induced changes on markers of systemic oxidative stress and heart rate variability (HRV) (Section 6.2.1 and Section 6.2.9). Additional, but inconsistent effects of PM2.5 on BP, blood coagulation markers, and markers of systemic inflammation have also been reported across disciplines. Together, the collective evidence from epidemiologic,controlled human exposure, and toxicological studies is sufficient to conclude that a causal relationship exists between short- term exposures to PM and cardiovascular effects. (p 2-15) and:
>
> Collectively, the studies evaluated demonstrate a wide range of respiratory responses, and although results are not fully consistent and coherent across studies the evidence is sufficient to conclude that a causal relationship is likely to exist between short-term exposures to PM2.5 and respiratory effects.

and: An evaluation of the epidemiologic literature indicates consistent positive associations between short-term exposure to PM2.5 and all-cause, cardiovascular-, and respiratory- related mortality (Section6.5.2.2.). ....Collectively, the epidemiologic literature provides evidence that a causal relationship is likely to exist between short-term exposures to PM2.5 and mortality.
and: Evidence from toxicological studies provides biological plausibility and coherence with studies of short-term exposure and CVD morbidity and mortality, as well as with studies that examined long- term exposure to PM2.5 and CVD mortality. Taken together, the evidence fromepidemiologic and toxicological studies is sufficient to conclude that **a causal relationship exists between long-term exposures to PM2.5 and cardiovascular effects.** (emphasis in original)

(Integrated Science Assessment for Particulate Matter. ISA: December 2009 EPA/600/R-08/139F).

Commenting on the ISA, the CASAC stated:

"CASAC also supports EPA's changes to the causal determinations for long-

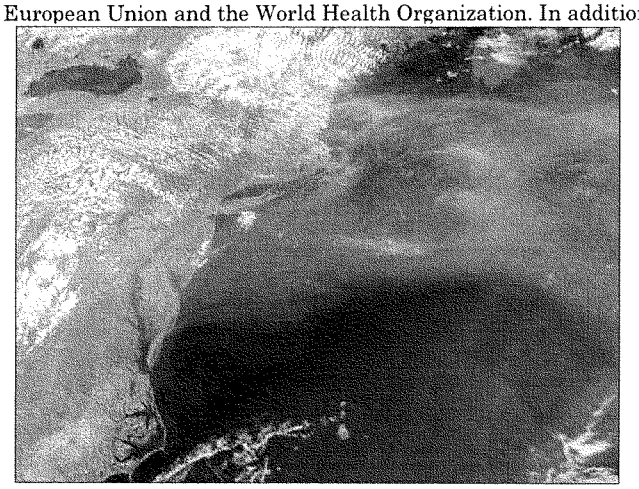
term exposure to PM2.5 and cardiovascular effects (from 'likely causal' to

'causal') and, "CASAC recommends 'upgrading the causal classification for PM2.5 and total mortality to '

causal for both the short-term and long-term time frames" (EPA-CASAC-10-001 Letter to the Administrator).

That is, CASAC has concluded that the association between PM2.5 and deaths is causal.

After reaching conclusions on the causality of the association of particles with early deaths, the US EPA presented the CASAC with a plan for doing a quantitative risk assessment, and after review, with a risk assessment for changing the ambient standard for particles, which was again approved by CASAC. As part of this process CASAC agreed that it was possible to quantify the early deaths that would be avoided by reducing particulate air pollution, a stance, as noted above, agreed by the European Union and the World Health Organization. In addition the U.S. National Academy of sciences report on Estimating the Public Health Benefit of Proposed Air Pollution Regulations supports that conclusion and specifically the use of the epidemiology studies to compute those estimates[1]. In summary, the scientific consensus is that particles cause early deaths, that reducing particle levels reduces early deaths, and that the association is strong enough to allow the reductions in early deaths to be quantified.



Particulate air pollution is not merely fatally dangerous, it is ubiquitous. The satellite picture below shows a particle haze obscuring the view of most of the eastern coast of the United States. In contrast, at the lower left of the image, one can see an area that has escaped the particle haze, where the ground is clearly visible. Particulate air pollution is the only manmade object visible from space. And, especially in summer months, the largest single source is often sulfate particles from coal burning power plants.

The Only Manmade Object Visible from Space

Mortality

I find, as did the major scientific organizations, that there is clear, convincing evidence that exposure to particles shortens life expectancy by substantial amounts. I base this judgment on the extensive literature, as outlined below.

In 1970, Lave and Seskin published a paper regressing age standardized mortality rates in US cities against average particle concentrations in those cities[2]. The advantage of that study was that the mortality experience of the entire population of each city was compared to the average particle concentration from the population- oriented monitors in the city. The difficulty was that no individual level covariates (i.e. other individual factors such as hypertension, diabetes, smoking, etc that may differ on average between the people in different cities, and might explain the differences between those cities in mortality rates) were controlled, raising questions about confounding (i.e. that another variable explains the observed association). More recent studies have alleviated that problem by recruiting cohorts of individuals in various areas, and measuring those individual covariates. It is these new cohort studies, starting with the Harvard Six City Study, and including the American Cancer Society (ACS) study, the Women's Health Initiative study, the Nurses Health Study, etc, together with parallel findings for short term effects and in toxicology that lead CASAC to tell EPA to conclude that the association of particles with total mortality was causal. The EPA Integrated Science Assessment states: "An evaluation of the epidemiologic literature indicates consistent positive associations between short-term exposure to $PM_{2.5}$ and all-cause, cardiovascular-, and respiratory-related mortality (Section 6.5.2.2.).... Collectively, the epidemiologic literature provides evidence that **a causal relationship exists between short-term exposures to PM2.5 and mortality**. (p2-11, emphasis in original)" and "Collectively, the evidence is sufficient to conclude that **a causal relationship exists between long-term exposures to PM2.5 and mortality**.(p2-12, emphasis in original). Below, I summarize the studies that supported that conclusion with emphasis on a set of issues, such as measurement error and confounding.

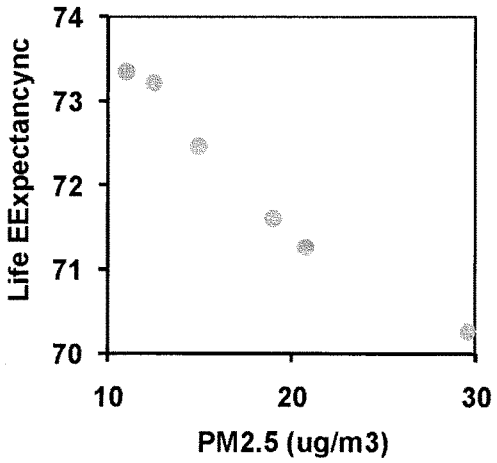
Measurement Error

An issue with most of those cohort studies is that they estimate community average pollution from monitors and assign the same exposure to everyone living in the same city. Because everyone's exposure in not, in fact identical, this is effectively error in assessing the exposure-health association, and likely to lead to an underestimate of the effect of exposure on mortality risk, which is the general result of such non-differential measurement error. In particular, in studies such as the American Cancer Society study some subjects could live as far as 100 miles from a monitor, adding considerable error to the exposure assignment for them.

These concerns apply to most of the cohort studies, with the obvious exception of the Six City Study[3]. The Six City Study chose a neighborhood within each city,

recruited a **random** sample of that neighborhood, and put a population oriented particle monitor in the middle of each neighborhood. This means that the extra source of uncertainty, and extra downward bias, present in the other studies is reduced in the Six City Analysis, suggesting this study should be given greater consideration. The reduction in life expectancy with higher exposure to particles that the Six City Study found was substantial, as indicated in the figure below, which shows the life expectancy in each city, after adjusting for age, sex, cigarette smoking, occupation, education, obesity, and chronic disease, plotted against the mean $PM_{2.5}$ in that city. To put this in perspective, between 1995 and 2005 life expectancy in the U.S. increased by 2 years. Hence, PM can obliterate the effects of one and a half decades of medical progress on life expectancy.

Further evidence that exposure error in the original ACS study and most cohort studies resulted in an underestimate of the effects of particles on deaths comes from a number of more recent studies. A reanalysis of the ACS study that only used monitors in the same county of residence of each subject to assign exposure (the original could assign subjects exposure from a monitor in a different county on the opposite side of the metropolitan area)[4].



That study found a substantially higher coefficient for the effects of sulfate particles on mortality than the original study. Even more intriguingly, another study examined only the 22,905 participants of the ACS study living in Southern California using a geographic information system based exposure model, which captures the local exposure gradient within Southern California, and reported even larger effect size estimates for $PM_{2.5}$[5]. Similarly, the Women's Health Initiative study found a larger effect on mortality when they used more local, within-city exposure estimates[6].

Another new cohort study examined over 66,000 nurses living in the Northeast and upper Midwest[7]. Unlike previous studies they used a spatial model that estimated individual exposures at the home address of each nurse, and found that a 10 $\mu g/m^3$ increase in $PM_{2.5}$ at the nurse's address was associated with a 26% increase in risk of dying in that year. As with other studies with better exposure estimates, this increase was considerably larger than that seen in studies that only looked at exposure differences across cities. Similar to my analysis of the Six City Study (see below), they found this increase was predominantly seen within a year of the change of exposure. This effect estimate is considerably higher than the Six City estimate, suggesting again the improved exposure results in higher estimates of the effects of particles on mortality.

Similarly, in the California Teachers Cohort study of Ostro results are reported using two exposure assignments. One analysis is restricted to participants living within 8 km (5 miles) of the nearest monitor. The other used subjects living within 30 km (19 miles) of the nearest monitor. The extra measurement error entailed in using monitors farther away results in an reduction in the estimated effect of sulfate particles on mortality rates by 25%[8]. In that study, sulfate particles, the ones produced by coal burning power plants, were more statistically significant as predictors of mortality than $PM_{2.5}$. Hence the use of more localized measures of exposure, with resultant lower exposure error, generally has resulted in larger effect estimates. That is, it is clear that the error in exposure by assigning air pollution in large areas to all subjects in that area is resulting in underestimates of the effects of particles. Consequently, estimates of early deaths avoided by reducing air pollution, using studies that relied on between city exposure differences, are almost certainly underestimates of the true health benefits.

Confounding

Studies that examine change in exposure play an important role in understanding the effects of particles for several reasons. First, if particle-induced changes in health are permanent, and we have to wait for a new generation before seeing public health improvements follow the exposure reductions, there are important public health implications. It certainly dramatically affects any cost-benefit analyses. Secondly, showing that a change in exposure produces a change in response more directly addresses the causality of the association. If A causes B, then changing A will change B. Finally, cross-area

comparisons between lung function, mortality rates, or any other response and cross-area variations in exposure across communities have the potential to be confounded by any unmeasured predictors of outcome that vary geographically (by confounder I mean another variable (e.g. smoking) that is causally related to the outcome, and correlated with exposure, which actually explains the observed association between, in our case, particles and outcome). That is, if we controlled for that other variable the association with particles would go away. Naturally, epidemiology studies try to identify such variables and control for them. Equally importantly, the Six City Study went further, and showed the association of air pollution with life expectancy before and after controlling for each potential confounder, such as smoking, hypertension, diabetes, occupational exposures, obesity, etc. There was no evidence of confounding by any of the covariates examined except age. Another recent analysis, which extended the previous analyses of the ACS study to include more years and more data, included census tract level data on socioeconomic status based on where the participants lived. Importantly they also reported associations between sulfate particles, the type produced by coal burning power plants, and deaths from ischemic heart disease[9]. Interestingly, they found that control for neighborhood socio-economic status increased the risk associated with sulfates, rather than decreasing it. This provides some reassurance that confounding is unlikely. However, one cannot measure everything about a person's health, so it is always possible that such confounding exists. That is why it is important to look at multiple studies, and multiple study designs that have different potentials for such confounding. For example, suppose there is an unmeasured health risk (say, smoking) in a cohort study that predicts mortality. For this to be a problem in the traditional analysis contrasting mortality rates across cities with air pollution across cities, smoking rates across cities would have to be correlated with particulate air pollution levels across cities. It is unclear why this would happen, but suppose this were also true in one study. Unless there is a *systematic process* that is inducing correlations between air pollution and smoking rates everywhere, another cohort study is unlikely to find the same problem. And why would the confounding remain if we only looked at differences in exposure and differences in mortality risk **within** a city, as in the new ACS analysis or the Nurse's Health Study or Women's Health Initiative analysis? And if there was something about the U.S. social structure that made that true in U.S. cities, why would that still be true in the Netherlands, with a very different social structure, where within city variations in particles were also associated with variations in the risk of death? It is hard to see how those same unmeasured confounders could apply in all the cases above.

One other way to assure that the observed association is real is to conduct studies not merely in different locations, and across different scales of geography, but in different ways, including where exposure varies by time, and not geographic location. Examinations of year to year changes in exposure within location do not suffer the potential confounding that, as above, some unmeasured confounder may differ from one city to another or even from neighborhood to neighborhood within city. These cannot be correlated with exposure that only varies from year to year within city. Other variables, which do vary from year-to-year, might confound, but are unlikely to be the same as the potential confounders of the cross-sectional associations. Hence, if associations are seen using this very different study design as well, it provides greater confidence that the associations are causal.

Consequently a key finding for cohort studies of mortality has come from studies examining *changes* in exposure and *changes* in mortality rates. Most of the cohort studies, including the original Six City Study, have contrasted a measure of long-term exposure with long-term survival. They tell us that people live less long in more polluted cities. They do not, directly, tell us what mortality reduction accompanies a reduction in exposure. In a follow-up of the Harvard Six City Study, Laden and coworkers provide precisely that estimate[10]. They examined a further 10 years of follow-up and mortality in the six cities. In some cities there was a substantial drop in pollution between the first and second follow-up periods, in some cities there was a moderate drop, and in some cities there was little or no change. The mortality rate ratios followed the same pattern: where there was a substantial drop in pollution there was a substantial improvement in life expectancy; where there was little change in pollution concentrations there was little change in life expectancy. The slope for *change* in exposure and *change* in death rate was similar to, but slightly higher, than the cross-sectional slope. Again, if the mortality rates change within a town as the air pollution changes, and those changes fit on the same dose-response curve as the original cross-sectional association, this provides substantial assurance that the association is not confounded, because the factors that are likely to confound an association of temporal change are usually different from those that might confound a cross-sectional study, and there is no reason for the confounding of two different estimates by different confounders to produce similarly sized estimated effects for particles.

This conclusion is also supported by natural experiments. Pope and coworkers reported that mortality fell in the Utah Valley in the year a strike closed a steel mill, and returned to its previous level the next year when mill operations resumed[11].

The finding of a rapid change in mortality risk associated with change in particle exposure in the Six City Study fits nicely with the similar report for lung function from the Swiss Cohort Study on Air Pollution and Lung Diseases in Adults (SAPALDIA) study[12].

Another recent study examined changes in life expectancy across 51 metropolitan areas in the United States, between 1980 and 2000. They found that 15% of the *increase* in life expectancy during that period came from *decreases* in air pollution, and that in the more polluted cities that cleaned up, life expectancy was increased by 10 months[13].

Recently, the study of Zanobetti and Schwartz examined over 190,000 subjects discharged alive from hospitals following myocardial infarctions (heart attacks)[14]. They looked at year-to-year changes in exposure **within** cities related to the probability of surviving that year, given the participant was alive on January 1. They adjusted for long-term time trend, and did separate analyses within each of 21 cities. They then combined the results across cities. This approach does not allow any differences in exposure across a city to contribute to the association (which is only examined *within* the city), does not allow similarities in long term trends in mortality and air pollution to contribute to the association, and again focuses on year to year temporal changes in particles and mortality. Hence, as in the Six City analysis above, the set of potential confounders is quite different from those in a traditional cohort study. They reported a significant association with PM_{10} in this susceptible subgroup; they also found larger coefficients (the slope between exposure and mortality risk) than were seen in the Six City Study. A follow-up study looking at people with chronic bronchitis and emphysema in the same manner found a similar result[15]. Another study in a similar vein was the work of Janke and coworkers[16]. They looked at 354 local governmental units in England. They look at annual mortality rates for multiple years in each location, controlling for *location and local time trend*. In effect they are looking at whether random deviations from year to year in air pollution around the local means and local time trend are correlated with random deviations in mortality rates around the local mean and local time trend. Such a design leaves little room for confounding. They found a strong association with particulate air pollution. This approach of looking at year to year changes in mortality rates and air pollution fits in quite well with developing studies looking at shorter term exposure to air pollution (discussed in the section on acute effects below), that have extended their ambit from looking at immediate effects of the last few day's exposure to include months of exposure. I examined the association of daily deaths[17] and hospital admissions[18] with particles when averaged over different periods, from days to months, after filtering out seasonal and long term trends. I found that the size of the PM effect increased as one went from days to periods of up to two months. At that point, the effect size estimates seemed intermediate between those reported in classical time series, which looked at yesterday's exposures, and those reported in the cohort studies.

A frequency domain regression approach by Zeger and coworkers showed similar results[19]. In several studies, Zanobetti and coworkers examined the time course of the mortality–death relationship directly, using distributed lag models[20, 21]. These models showed a pattern concordant with my hypothesis. There was an immediate increase in deaths following an increase in particle exposure, followed by a long tail of slightly increased deaths, stretching out for 40 days after the initial response. Time series studies by their nature have to control for season, and this makes it difficult to examine lags longer than a month or two, but the substantial increase in effect size reported by Zanobetti in these studies again suggests that the short term and long term responses to changes in airborne particles fall on a continuum.

Further support for this theory comes from recent studies looking at pregnancy outcomes and infant mortality. Both responses, by definition, involve exposures of less than a year. For example, Bobak and Leon examined the cross–sectional association between air pollution and infant mortality rates across towns in the Czech Republic[22, 23]. A significant association was seen with particle concentrations. Woodruff and coworkers compared infant death rates in US cities with their levels of PM in the air[24]. They excluded infant deaths in the first month after birth as likely to reflect complications of pregnancy and delivery, and found that PM_{10} was associated with higher death rates in the next 11 months of life. This excess risk seemed to be principally from respiratory illness, although sudden infant death syndrome deaths were also elevated. Further studies in later years, and looking at $PM_{2.5}$ confirmed this association[25, 26].

Dose Response and Threshold

A critical issue is whether a threshold exists for the effects of particles, and more broadly, what is the shape of the dose response curve. After its recent reviews of the literature, EPA has concluded there is no evidence for a threshold. For example, the Regulatory Impact Analysis for the Transport

Rule, states:

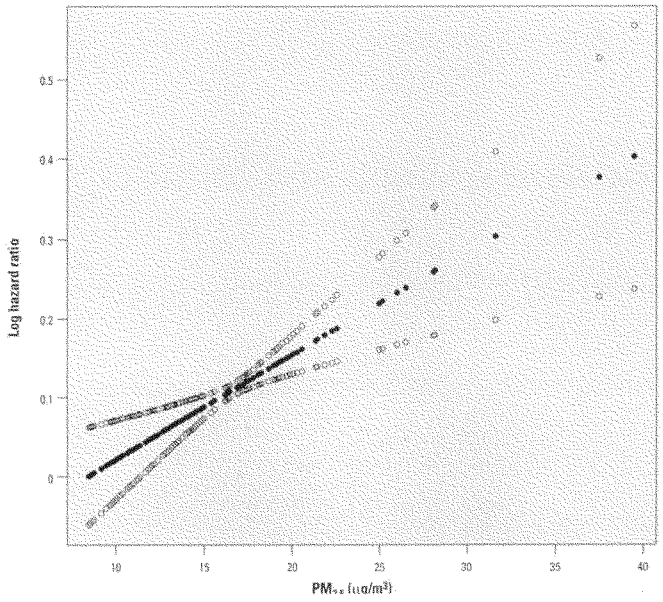
"Based on our review of the current body of scientific literature, EPA estimated PM related mortality without applying an assumed concentration threshold. EPA's Integrated Science Assessment for Particulate Matter (U.S. EPA, 2009b), which was recently reviewed by EPA's Clean Air Scientific Advisory Committee (U.S. EPA-SAB, 2009a; U.S. EPA-SAB,2009b), concluded that the scientific literature consistently finds that a no-threshold loglinear model most adequately portrays the PM-mortality concentration-response relationship while recognizing potential uncertainty about the exact shape of the concentration-response function." (EPA 2011, p 192). This issue was extensively peer reviewed by the CASAC, which concurred with the conclusion that there is no evidence for a threshold.

"Although there is increasing uncertainty at lower levels, there is no evidence of a threshold (i.e., a level below which there is no risk for adverse health effects)."(EPA-CASAC-10-015, letter of 9/10/2010 to the Administrator of EPA).

Similarly, the EPA Policy Assessment, also reviewed and approved by CASAC, stated: "We note that no discernible thresholds have been identified for any health effects associated with long or short-term PM2.5 exposures." (p ES-1)

The National Academy of Sciences concurs, stating[27], "For pollutants such as PM_{10} and $PM_{2.5}$, there is no evidence for any departure of linearity in the observed range of exposure, nor any indication of a threshold". This is also the view of the World Health Organization.

The Office of Management and Budget asked EPA, as part of its risk assessment process, to conduct an expert elicitation on the dose-response relation between particles and deaths, and have it reviewed by EPA's external review body, the Science Advisory Board. This is a well-established process in Decision Science, and in this case involved having an outside contractor select experts in the field, obtain from them the studies each thought were most relevant to the issue and making sure all the experts had seen all the studies, and then conducting a structured 8 hour interview with each expert separately. In addition to review by the Science Advisory Board, this analysis was also published in a peer review journal. Part of this process addressed the question of a threshold. As noted in EPA's Expert Elicitation Report, 11 out of 12 reviewers believed there was neither evidence nor even a theoretical basis for a threshold. The remaining reviewer thought there was a 50% probability of a threshold, but that if it existed, there was an 80% probability that it was below 5 $\mu g/m^3$. There are no counties in the US with annual average concentrations that low, rendering such a threshold moot. It is easy to see why they reached this conclusion. For example, in another follow-up analysis of the Six City Study I looked at year-to-year changes in particle concentrations to examine two



questions—does the dose-response continue below 15 $\mu g/m^3$; and what is the lag between change in exposure and change in mortality rate[28]. We used a penalized spline with up to 18 degrees of freedom (essentially, a polynomial with 18 terms to capture any deviation from linearity), showed that the association was essentially linear down to 8 $\mu g/m^3$, where the data becomes sparse, and that the effects of reduced particle exposure on mortality appear to be mostly seen within two years. The figure below shows that association.

Because the uncertainties around the dose-response curve from fitting a particular model do not reflect the uncertainty in model choice we also used model averaging, where 32 models are fit explicitly, and averaged, weighted by their probability of being correct given the data[28]. These models explicitly included the possibility of thresholds at multiple different particle concentrations. The association was again indistinguishable from linear with no evidence of a threshold down to the lowest measured level of 8 $\mu g/m^3$. Similarly, Pope and coworkers used nonparametric smoothing to look at the association of PM2.5 and mortality in the ACS cohort, and the association was linear from 15 $\mu g/m^3$ down to the lowest observed levels (which were also about 8 $\mu g/m^3$)[29].

Generalizability

Each cohort study selected people in different ways, an all were living in urban areas. This could raise questions about the generalizability to rural areas. More recently an innovative study modernized the Lave and Seskin approach to address this. They looked at over 2300 counties in the Eastern US, and used remote satellite sensing data to estimate $PM_{2.5}$ concentrations everywhere. The satellite data allows the incorporation of the many counties without monitoring. This allowed them to include thousands of counties, rather than hundreds. The examined the entire population of each county, avoiding any selection issues. They reported that standardized mortality rates for ischemic heart disease were associated with $PM_{2.5}$, in the Eastern US, a region of the country where sulfates from coal burning power plants are a major source of $PM_{2.5}$[30]. The association between airborne particles and mortality implies a very large public health impact. For example, the Laden paper suggests that an average 5 $\mu g/m^3$ decrease in $PM_{2.5}$ concentrations in the US would be associated with a 5-10% decrease in total mortality, which is 100,000-200,000 fewer deaths per year. **For comparison, the lower bound estimate is more deaths than from AIDS, breast cancer, and prostate cancer combined**. While the association between exposure to particulate matter (PM) mass and mortality is well established, there remains uncertainty as to whether certain chemical components of PM are more harmful to human health than others. To date the evidence is not convincing that any form of fine combustion particles are more or less toxic than average, with different studies showing different results. It is important to understand that the conclusion (of the Clean Air Scientific Advisory Committee and others) that we cannot differentiate the toxicity of different types or sources of particles does not mean that we believe it likely that one type of source of particles

will ultimately prove to be the "toxic agent". Rather, the consensus scientific opinion is that all fine combustion particles are toxic, although they may vary in their toxicity. There have been time series studies in locations, such as Santa Clara, CA, in the winter, where wood smoke is the dominant source of particles, that show significant associations with daily deaths[31, 32]. There are studies in locations such as Philadelphia where secondary sulfate particles are the major source, which again show day to day changes in air pollution are associated with day to day changes in deaths[33-36]. In Sao Paolo, Brazil, where traffic particles are the major sources, again, particles are associated with increased deaths[37, 38]. While we have not yet distinguished the relative effects of different sources of particles, it is clear that they all contribute to early deaths. In the absence of good evidence that any source or type of particle had a *different* impact, CASAC recommended maintaining a standard for $PM_{2.5}$, that is, treating particles from all sources as having the *same* toxicity.

Sulfates are the principal particle type generated by coal burning power plants. Cohort studies such as the Six City Study and the ACS Cohort have reported that sulfates were associated with decreases in long term survival[3, 29].

Sulfates have also been associated with increases in mortality in time series studies of acute exposure, including Mar et al who found increased total and cardiovascular mortality associated with a regional sulfate factor in Phoenix[39], suggesting that the impact of sulfates is not only an east coast phenomenon.

While epidemiologic studies generally do not have the strength of an experimental design, the study of Pope and coworkers is an exception to that rule[40]. They looked at a natural experiment. A copper smelter strike in the Southwest between 15 July 1967 and early April 1968 shut down all the smelters in the region. During that period, smelters accounted for the large majority of the sulfate particles in these southwestern states. As reported by Trijonis and Yuan (1978) and Trijonis (1979) this strike led to significant reductions in sulfate particles in the Southwest, with an average decrease of 60% during the 8.5 month strike, which was equivalent to a reduction of approximately 2.5 $\mu g/m^3$ in mass concentration. This natural experiment really is equivalent to a randomized trial. The population of the downwind states had no choice in the matter—they were exposed to higher, lower, and higher sulfate concentrations over time, just as in a crossover trial for a drug. Nor did they even have a perception that their exposure was changed, since sulfate concentrations are not a routinely monitored criteria air pollutant, and there was little public attention to air pollution in this period.

Pope and coworkers analyzed this natural experiment to see how mortality rates change in response to the change in sulfate concentrations. After controlling for time trends, mortality counts in bordering states, and influenza/pneumonia deaths;

they found that the 2.5 $\mu g/m^3$ decrease in sulfate particle concentrations resulted in a 2.5% decrease in the number of deaths in the four-state region. This unambiguously establishes secondary sulfate particles as a cause of early death.

In comparison, a 2.5 $\mu g/m^3$ decrease in long term average $PM_{2.5}$ concentrations in the American Cancer Society Cohort study was associated with about a 1.5% decrease in deaths, whereas in the Harvard Six City Cohort, the same decrease was associated with a 4% reduction in deaths. Hence this natural experiment not only shows that sulfate particles kill people, its effect size is consistent with the long term studies of mortality from following cohorts. This has two implications. First, it again suggests that there is no reason to believe that sulfate particles are less toxic than average. Second, it shows that the reductions in mortality from reducing air pollution do not take years to show up, they occur within the first year. If additional reductions would have occurred in subsequent years, then this study underestimates the health benefits of reducing sulfate particle levels. O'Neill et al found an association between real outdoor sulfate particles and endothelial dysfunction[41], and Chuang found sulfate increased oxidative stress and coagulation in a panel study[42]. Sulfate particles were also associated with disturbances in electrocardiogram patterns in studies of repeated measurements in two different populations of elderly adults[43, 44]. The positive sulfate effects observed in epidemiological studies may be attributable to the greater complexity of the sulfate particles in ambient air than the simple ammonium sulfate particles which are often used in toxicological studies, but are not often found in nature. For example, acid sulfate in the form of sulfuric acid or ammonium bisulfate can convert insoluble metal oxides (also present in ambient particulate pollution) to bioavailable sulfate salts, and studies of particles collected in Washington DC have shown that much of the metal content was associated with sulfates. Metals on particles in turn have been linked to a wide variety of toxic responses. For example, toxicologic studies show Zinc sulfate to have cardiotoxicity.

Recently, Franklin and coworkers used data from the PM speciation network to examine this question further[45]. Because particle components, including sulfates, were only monitored 1 day in 3 or 1 day in 6, while $PM_{2.5}$ was monitored daily, they used a two stage approach. Taking advantage of the natural variation in PM components between cities, and between seasons within city, they fit season specific regressions in each of 25 cities with speciation monitors, in each season. In a second stage, they examined how the association between $PM_{2.5}$ and daily deaths was modified by the ratio of sulfate to particle mass, and similarly for the other measured components. If sulfates have a different toxicity than average for particles, then one would expect that a city where a high fraction of total particles were sulfate would have a different slope than a city with a low fraction. We found a significant overall effect of $PM_{2.5}$ with total mortality. Cities with high fractions of sulfate, arsenic (also a tracer of particles from coal burning power plants), silicon, and nickel had roughly twice the mortality slope as cities with low fractions. When multiple components were considered simultaneously, sulfate, nickel, and aluminum

remained significant, and explained all of the apparent variation in effect estimates across cities and seasons.

A new analysis of the ACS study by Krewski and coworkers examined the extended follow-up period for the ACS, and looked at sulfate particles as well as all PM2.5.[9] Interestingly, they found a stronger effect for sulfates. They report that after controlling for the maximum number of individual and area based potential confounders that a 10 $\mu g/m^3$ increase in sulfate levels was associated with a 9% increase in death rate if they used as exposure sulfate levels two years before the cohort was recruited, and a 17% increase in death rates when they used sulfate levels from 1990, roughly the midpoint of the follow-up of the cohort. These sulfate effects were larger than the effect for $PM_{2.5}$ in that study. Similarly, in the California Teachers Cohort study of Ostro, which was described before, sulfate particles were more statistically significant as predictors of mortality than $PM_{2.5}$

Conclusions

The EPA Regulatory Impact Assessment for the Transport rule estimates that the pollution controls it requires will save 13,000 deaths per year based on the ACS study, and 34,000 deaths per year based on the Laden study. As noted above, recent studies have reported larger coefficients than either of these two studies, and the Laden study is not a high estimate, but rather a mid-range estimate. This conclusion is also endorsed by CASAC. In their review of the risk assessment for the new NAAQS for particles they stated:

> Based on quantifiable sensitivity analysis, thereport generally clearly conveys that the "core"estimates appear to be at the low end of alternative"plausible" estimates.

Indeed using the sulfate coefficient from the most recent analysis of the ACS study would result in an estimate 50% larger than the estimate based on the Laden study. Hence is clear that this rule will save tens of thousands of lives each year, and probably many tens of thousands of lives each year. There are very few government policies that have such a large public health impact, and the cost per life saved is quite low compared to most other policies. This policy should be implemented as soon as possible.

Ms. BUERKLE. Thank you, Dr. Schwartz.

I am going to yield the ranking member 5 minutes for questions.

Mr. KUCINICH. I want to thank the gentlelady for her indulgence. I am going to have to leave as soon as I am through with the questions. I am offering an amendment on the floor. I am very grateful for your kindness.

At a June 1, 2011, meeting with investors when discussing the risk of closures to plants as a result of EPA rules, the chairman of AEP Michael Morris told investors the following: As you know, those are high-cost plants. Throughout almost all of 2009 those plants probably didn't run 5 percent of the time because of natural gas prices. When we shut those down, there will be some cost savings as well, and on balance, we think that is the appropriate way to go.

That is the sum and substance of what was said. Now, what CEO Morris is saying is that AEP has already had to shut down certain coal-burning power plants due to competitive pressure from lower cost natural gas. These are the same plants that would have to be retrofitted or shut down to comply with EPA regulations.

Now, Ms. Henry, if AEP is already shutting down these same plants because they are high cost and are uncompetitive in the market, how can you come here today and portray EPA's rules as infeasible and blame the EPA for forcing a large number of premature power plant requirements?

Ms. HENRY. Thank you, Ranking Member Kucinich.

The plants referred to in the chairman's remarks and the plants referred to in the studies that have been conducted as a result of EPA's rules are not necessarily the same plants. I think that we will need to go back and look at the plants that the chairman was referring to.

Mr. KUCINICH. So you are saying you really don't know which plants he is talking about, is that right?

Ms. HENRY. I am not certain of the universe of plants he's talking about.

Mr. KUCINICH. Okay. We would like you to provide that information to this committee.

Ms. HENRY. If I could respond.

Mr. KUCINICH. No. You don't know the answer, so I am going to ask my next question.

If the price of natural gas relative to coal stays where it was at the time your CEO is explaining his decision to close certain plants and that price stays the same through 2014, isn't it a fact that AEP will keep those plants closed through 2014?

Ms. HENRY. If the price of natural gas stays at the current rates——

Mr. KUCINICH. Right. At the time—right.

Ms. HENRY. As the time the chairman was making——

Mr. KUCINICH. Will those plants stay closed?

Ms. HENRY. The plants were running at low-capacity factors; they were not closed. And those plants run during times of peak energy demand and are used to respond to needs for additional power on days like we experienced this past week. Having those plants available to respond to those peak demands is critical to the integrity of the electrical grid.

Mr. KUCINICH. So what you are saying is that those plants are specifically part of meeting peak demands and they are otherwise totally efficient and not subject to market fluctuations that would come about as a result of natural gas competition?

Ms. HENRY. Certainly if the price of natural gas were to increase significantly, their capacity factors might go up because their dispatch might be more economic than the gas plants that run also at peak periods of time. But I think that the critical point is that the plants provide both that peak capacity reserve and also supply——

Mr. KUCINICH. Well, if natural gas costs more. But what if natural gas costs less? Would it likely be that those plants would be out of capacity because they are not able to compete with natural gas?

Ms. HENRY. That would depend upon the availability of those plants and other plants on the system to respond to that peak.

Mr. KUCINICH. Did AEP lay off those workers at the plants that had to close due to lower-priced natural gas, or did you find other assignments for them?

Ms. HENRY. Some of the workers were part of a voluntary severance program that we conducted last year in response——

Mr. KUCINICH. So they were voluntarily separated, they weren't laid off, is that what you are saying?

Ms. HENRY. That is right.

Mr. KUCINICH. So they lost their jobs?

Ms. HENRY. There will be an additional 600 jobs lost when those plants are finally closed.

Mr. KUCINICH. Ms. Henry, AEP is the author of a bill entitled Electric Power Regulatory Coordination Act of 2011, is that correct?

Ms. HENRY. I don't think there is——

Mr. KUCINICH. You haven't heard that? Okay. Are you familiar with a bill by that name?

Ms. HENRY. I am not familiar with a bill by that name.

Mr. KUCINICH. Madam Chair, I am going to ask unanimous consent to put this report by the NACP and other groups in about the situation in Ohio with respect to coal and electric utilities.

Ms. BUERKLE. Without objection.

Mr. KUCINICH. Are you familiar Ms. Henry with a draft, discussion draft circulated that has been dubbed the Electric Power Regulatory Coordination Act of 2011, that would halt implementation of the Nation's clean air laws?

Ms. HENRY. I am not familiar with the specific draft that you are referring to.

Mr. KUCINICH. You never heard of that?

Ms. HENRY. No.

Mr. KUCINICH. You have no knowledge whatsoever of any kind of discussion draft that relates to a bill by that name?

Ms. HENRY. I know that AEP assisted in the preparation of some suggested language for legislation that might have had that impact.

Mr. KUCINICH. That is what I am talking about. This bill proposes to wait another 6 years before we limit toxic mercury from some power plants as well as delaying limits on a host of other dangerous pollutants, is that not correct?

Ms. HENRY. That would be an incorrect characterization.

Mr. KUCINICH. Pardon?

Ms. HENRY. That would be an incorrect characterization of the language that AEP proposed.

Mr. KUCINICH. Wait. You just told me—are you familiar with this bill or not? Do you know the bill or don't you? You are just giving me a response that it is an incorrect characterization of a bill that you weren't really sure about.

Ms. HENRY. I said I am not familiar with whatever——

Mr. KUCINICH. Okay. I withdraw my question, Madam Chair.

I am going to submit questions in writing so that Ms. Henry can become familiar with the questions that we are concerned about. And also she can familiarize herself with her own understanding of this draft discussion that I am asking about. I appreciate it. Thank you.

Ms. BUERKLE. Without objection.

[The information referred to follows:]

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Moore w/Book.

AEP
AMERICAN® ELECTRIC POWER

August 16, 2011

Honorable Dennis J. Kucinich
Ranking Member
Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending
Committee on Oversight and Government Reform
2157 Rayburn House Office Building
Washington, D.C. 20515-6143

Dear Representative Kucinich:

Please find attached the response of American Electric Power (AEP) to the Questions for the Record that you posed to AEP in connection with the hearing entitled "Lights Out: How EPA Regulations Threaten Affordable Power and Job Creation," which was held on July 26, 2011 by the Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending of the Committee on Oversight and Government Reform.

As requested by Chairman Issa, AEP is submitting a hard copy of the AEP response to the full Committee office at 2157 Rayburn House Office Building, as well as an electronic version of the AEP response to Michael Bebeau, Assistant Clerk, by email in a single Word formatted document.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Anthony P. Kavanagh

Anthony P. Kavanagh
Sr.Vice President, Governmental Affairs *On behalf of*
Janet Henry
Deputy General Council

AEP RESPONSE TO QUESTIONS

1) At the hearing on July 18, Ranking Member Kucinich introduced a slide summarizing comments made by Michael G. Morris, Chairman and Chief Executive Officer of AEP on June 1, 2011 at the Sanford C. Bernstein & Co. Strategic Decisions Conference, regarding the effect of the Environmental Protection Agency's (EPA's) Cross Air Transport Rule and the Mercury and Air Toxic Rules on AEP's revenues. In response to the question posed, Mr. Morris stated that "As you know those are high-cost plants ... throughout almost all of 2009 those plants probably didn't run 5% of the time because [of] natural gas prices .... When we shut those down there will be some cost savings as well ... And on balance we think that that's the appropriate way to go ...."

At the hearing, Ranking Member Kucinich asked Ms. Henry to reconcile Mr. Morris' statements with Ms. Henry's own testimony, which stated that "abrupt" power plant retirements will be required due to "high costs of compliance and the infeasible deadlines" imposed by the EPA rules, including that "50 and 110 GW of coal fired capacity will be forced to prematurely retire due to proposed EPA rules." In response, while she explained that she was not certain, she was willing to assert that "the plants referred to in Mr. Morris' remarks and the plants referred to in the studies that have been conducted as a result of EPA's rules are not necessarily the same plants."

Please provide the Committee with a complete explanation of Mr. Morris' statement, including;

a. A complete and accurate response to whether Mr. Morris' comments at the June 1 investors conference did in fact refer to the same plants that would have to be retrofitted or shut down to comply with EPA regulations, including identification of each plant that was covered by either or both Mr. Morris' statement to investors and Ms. Henry's statement to Congress; and

b. Whether AEP would maintain its plan to close the plants referenced in Mr. Morris' comments even if the implementation of the EPA's Clean Air Transport Rule and Mercury and Air Toxics Rule were delayed.

Answer: ***The statement by Mr. Morris was in response to a question from an analyst at a conference on June 1, 2011. The analyst asked Mr. Morris whether the 5.5 gigawatts of coal-fired generation capacity identified in AEP's financial statements as potentially vulnerable to closure due to the high cost of compliance with the EPA's anticipated rules would, if closed, have a significant impact on AEP's revenues from off-system sales or capacity payments. Mr. Morris responded that EPA's rules have similar impacts on a total of about 80 gigawatts***

of coal-fired capacity, mostly in the central U.S., so that any revenue impacts would be moderated by higher forward prices for capacity and energy and reduced operating costs. The vulnerable plants referenced by Mr. Morris had previously been identified in investor presentations as the "fully exposed" units in the AEP eastern system, those units that currently are not equipped with either flue gas desufurization systems (FGD) or selective catalytic reactors (SCRs) and that burn primarily eastern bituminous coals. A list of those units is attached as Attachment A.

Mr. Morris also noted that some of the plants expected to be vulnerable to closure had not run much in calendar year 2009, due in part to low natural gas prices, while also emphasizing the point that those plants were not contributing appreciably to off-system sales. AEP's 2009 operations were also heavily impacted by the state of the economy, including a 16 percent decline in industrial sales and a 50 percent decrease in off-system sales. AEP projected a moderate recovery in both areas in 2010, which in fact occurred, and was accompanied by higher residential and commercial demands due to weather conditions.

Capacity factors for some of these plants were low in 2009, but they were available and operating during periods of peak demand. Only six of the plants listed in Attachment A had capacity factors below 20 percent in 2009; the majority of the plants ran at capacity factors of between 40 percent and 70 percent in 2009. Capacity factors for most units increased in 2010, and all of the units listed on Attachment A were running whenever available during the recent heat waves experienced in several parts of the country. Record peak electricity demands have been set in 2011 in both the PJM Interconnection, the market that includes AEP's eastern system, and the Southwest Power Pool, the market that includes most of AEP's western system. We also have asked customers on several occasions to reduce electricity usage during these recent peak periods in order to maintain the stability of the electricity grid.

Shortly after the June 1st conference referenced above, AEP completed a more detailed analysis of EPA's proposed rules, particularly the requirements of the proposed Clean Air Transport Rule (CATR) and the proposed Electric Generating Unit Maximum Achievable Control Technology (EGU-MACT) Rule. That analysis is the one referenced in Ms. Henry's testimony, and it revealed that additional "partially exposed" units (units that already are equipped with either an FGD or an SCR, or that utilize primarily low-sulfur western coals) were also vulnerable to premature retirement if the rules were implemented on the schedules included in the proposed rules. A list of the units identified in that study is included in Attachment B. The lists are similar, but not identical.

Although some of these plants referenced in the statement by Mr. Morris or in Ms. Henry's testimony might have closed due to age, physical condition, or other economic factors within the next decade, those plant closures would have been phased-in after completing detailed planning and implementing measures to

address any concerns for grid stability, black start capability, and/or replacement generation. EPA's rules greatly accelerate generating unit retirements that might have occurred in the next decade, compel additional retirements, and require idling of units until pollution control retrofits can be completed because of the unreasonable compliance schedules.

AEP's concern, as expressed in Ms. Henry's testimony and AEP's comments to EPA, is that the time frame for compliance with the EPA requirements is not adequate, and that premature retirements will not be properly analyzed nor will the implementation of appropriate remedial measures be feasible before affected units must be retired. As noted in the recent comments filed by PJM and other regional transmission and reliability organizations (RTOs) on EPA's proposed EGU-MACT, attached as Attachment C, RTOs would prefer to have two years' advance notice in order to properly assess the impact of unit retirements on the electricity grid. Moreover, the RTOs have indicated in their comments that additional time beyond the EGU-MACT compliance deadline may be necessary for them to take the appropriate remedial action, particularly if the units are providing critical voltage support or black start capability. AEP has recently provided notice to PJM of its intention to terminate black start service agreements for 17 generating units beginning January 1, 2012, due to the more stringent requirements of the final Cross-State Air Pollution Rule (CSAPR). A copy of that notification is attached as Attachment D.

2) At the hearing, Ms. Henry denied having any knowledge of a bill that has been circulated in Congress entitled "Electric Power Regulatory Coordination Act of 2011" that would "halt implementation of the nation's clean airs laws," yet she acknowledged that "AEP assisted in the preparation of some suggested language for legislation that might have had that impact." Multiple news sources have reported that AEP has in fact written legislative language at the request of lawmakers which would delay EPA regulations and exempt older coal plants that are slated for retirement before 2020.[1] AEP's website advertises a proposal that would "[p]has[e] in the comparable emissions requirements through 2020" similar to the language proposed in the draft bill entitled the "Electric Power Regulatory Coordination Act of 2011." Please provide the following information regarding AEP's involvement in any legislative proposals that would delay implementation of EPA rules:

[1] *See e.g* E&E Publishing, *American Electric Power Seeking Legislation to Delay EPA Regulations* Apr. 28, 2011); Natural Resources Defense Council, *Environmental Leaders to AEP: What's Your Number* (May 10, 2011).

a. Please provide the Committee with all draft legislative language proposed by AEP to any member of Congress or their staff relating in any way to EPA rules affecting the power industry;

Answer: ***AEP is providing in Attachment E copies of all draft legislative language proposed by AEP, and copies of all of AEP's suggested refinements to draft legislative language, that were shared with any member of Congress or their staff relating in any way to EPA rules affecting the power industry since the publication of the proposed CATR in August 2010.***

At the hearing, Ms. Henry indicated to Representative Kucinich that "AEP assisted in the preparation of some suggested language for legislation" and sought to provide to Representative Kucinich with an explanation of the "language that AEP proposed."

In follow-up questioning with Representative Buerkle, Ms. Henry provided further explanation of how the AEP draft legislative proposal was designed to work. Among other things, Ms. Henry stated that the AEP proposal "would have provided for a phased in program to allow sufficient time in order for all of the controls that are required by the various EPA proposals to be phased in over a slightly longer period of time than is proposed under the Cross-State Air Pollution Rule and the Utility MACT rule instead of having all of the requirements become final and effective in 2014."

Although Ms. Henry provided answers on the substance of the draft legislative proposal, there was unfortunately some confusion at the hearing as to the title of that proposal. Representative Kucinich made reference to the "Electric Power Regulatory Coordination Act of 2011," a title that Ms. Henry did not recognize at the time that the question was posed. The title of the legislative draft proposal developed by AEP changed over time and subsequent versions were entitled "Clean Power and Jobs Protection Act of 2011." AEP respectfully requests to correct the hearing record by confirming that Ms. Henry has knowledge of the draft legislative proposal entitled "Electric Power Coordination Act of 2011," as referenced by Representative Kucinich during the hearing.

b. Please explain how AEP justifies delaying the implementation of the Clean Air Transport rule and the Mercury and Air Toxic Rule in light of estimates that these new rules would save more than 50,000 lives by 2016?

Answer: ***AEP supports the goal of the Clean Air Act that all areas achieve air quality that protects human health with an adequate margin of safety. Our strong commitment to clean air is reflected by the fact that AEP has invested over $7 billion in emissions control equipment since 1990, and that we have reduced our annual SO_2 emissions by about 1.1 million tons (a 73 percent reduction) and our annual NO_x emissions by about 450 thousands tons (an 80 percent reduction) over that same period. AEP has achieved the significant emission***

reductions required of the electric utility industry in the Acid Rain Program, the NO_x SIP Call, and the Clean Air Interstate Rule (CAIR), and is well-positioned to achieve the further reductions required by CAIR in 2015.

In measuring the air quality improvements under CSAPR, EPA specifically declined to recognize the significant reductions that have been and continue to be made as a result of CAIR, claiming that these reductions might not continue if CAIR is withdrawn. EPA's exclusion of the CAIR emissions reductions results in a corresponding overstatement of the air quality improvements that EPA claims to result from CSAPR. This fact has been demonstrated in recent air quality modeling performed by the Midwest Ozone Group (MOG). Specifically, the MOG air quality modeling demonstrated that the emissions reductions required by CAIR, together with other EPA requirements already on the books, are adequate to attain the 1997 and 2006 ambient air quality standards for ozone and fine particulate matter in 2014, the same goals that CSAPR is intended to achieve in 2014. In short, very substantial emission reductions have already been made and will continue to be made without having to impose additional emissions reductions, as required under CSAPR. Moreover, the imposition of these reductions on the accelerated schedule mandated by CSAPR will have significant adverse effects on electricity customers and the broader economy.

AEP is very concerned about the feasibility and economic consequences of achieving the mandated emissions control requirements within the tight deadlines of the new EPA rules. As Ms. Henry explained in her testimony, AEP does not believe that EPA is providing sufficient time to design, permit, and install major emissions control technologies on large amounts of existing coal-fired capacity that are necessary to comply with the new EPA rules within the 2014 to 2015 time frame. In addition to sharp electricity price increases and about 1.4 million job year losses through 2020, impacts projected by recent studies include coal-fired power plant retirements ranging from 50 to 110 gigawatts. Such a large amount of power plant retirements could pose significant risks of unanticipated electric grid reliability problems, particularly during the 2014-2016 period when most of the coal-fired power plant shutdowns and capacity curtailments are expected to occur.

Notably, these concerns about significant power plant retirements and resulting potential electric reliability problems also have been recently raised in the responses that Commissioners of the Federal Energy Regulatory Commission (FERC) submitted on August 1, 2011 to Senator Lisa Murkowski, as the Ranking Member of the Senate Committee on Energy and Natural Resources. According to the response of FERC Chairman Wellinghoff and FERC Commissioners LaFluer and Norris (Joint FERC Commissioner Response), a preliminary assessment performed by Commission staff "showed 40 GW of coal-fired generating capacity 'likely' to retire, with another 41 GW 'very likely' to retire." Joint FERC Commissioner Response at pages 2, 3, and 5. In a separate response to Senator Murkowski, FERC Commissioner Moeller also expressed his concern

with the adverse impacts of the EPA rulemakings, stating that the EPA rulemakings have "the potential for a negative impact on reliability" and that "the system can absorb significant retirement of older coal-fired, oil-fired, and natural gas-fired generating units. But it absolutely must be done in an orderly manner that does not impact our health and safety." Moeller Response at page 7. Importantly, Commissioner Moeller went on to conclude: "The timing of the EPA regulations does not conform to the relevant planning horizons in the electric sector of our economy, one of the most capital-intensive sectors of industry. Transmission lines and power plants are often planned over a ten-year period, and in consideration of the long-lived nature of assets that are expected to be in service for more than forty years." Moeller Response at pages 7-8. Copies of all FERC Commissioner Responses to Senator Murkowski are provided in Attachment F.

AEP believes that the FERC concerns, as highlighted above, further underscore the conclusions of other recent studies that more time for phasing in the new EPA control requirements is necessary in order to avoid the adverse reliability and economic impacts that are likely to occur under a 2014-2016 compliance time frame. Longer time frames would enable better planning, ensure electricity grid reliability, avoid stranded investments of major electric utility assets, and mitigate excessively high costs for pollution controls due to supply constraints.

For these important energy reliability and economic reasons, AEP has been working closely with several labor unions to develop a new regulatory approach, including the International Brotherhood of Electric Workers, the United Mine Workers of America, and the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers, and Helpers. This new regulatory approach is reflected in proposed draft legislation that would establish a new framework for achieving the overall objectives of the EPA rules in a coordinated manner that promotes an efficient transition to a new fleet of clean electric power generation. To achieve this objective, the bill requires all coal-fired electric generating units to either shut down (and where appropriate be replaced with new clean generation) or be equipped with advanced pollution control equipment to meet stringent SO_2, NO_x, and mercury emissions control standards in a phased manner ending in 2020. The installation of these state-of-the-art emissions controls are phased in over time, with 60 percent of existing coal-fired capacity to be retrofitted with the necessary SO_2, NO_x, and mercury controls by the end of 2016, 80 percent by the end of 2018, and 100 percent by the end of 2020.

This time frame is still extremely ambitious given the massive capital investment that the electric power sector will need to make in order to comply with the EPA rules. As noted in Ms. Henry's testimony, a study conducted by National Economic Research Associates estimated the capital costs to be approximately $124-168 billion to comply with the less stringent proposed CATR and the proposed EGU-MACT Rule. The proposed AEP approach would also eliminate the continued uncertainty that the EPA rules may be overturned through legal

challenge, and thereby ensure continuous progress in improving air quality across the nation.

3) AEP provided the Committee with a PowerPoint presentation summarizing the cumulative impact of five different EPA rules: the Clean Air Transport rule, the Regional Haze rule, the Hazardous Air Pollutants rule, the Coal Combustion Residual rule, and the Cooling Water Intake rule. In this presentation, AEP only provided the estimated cumulative impacts of the five rules evaluated.

a. Please provide the Committee with AEP's analysis of each of the individual rules and the impact of those rules, and an explanation of how this data was compiled, including the underlying data and assumptions used to perform AEP's analysis. If AEP does not have a rule-by-rule breakdown, then please explain why that is so, and explain AEP's estimate of the cumulative impacts of the five rules taken together, including the underlying data and assumptions used to perform AEP's analysis.

Answer: ***AEP developed a presentation showing the cumulative impact of EPA's proposed CATR, EGU-MACT, cooling water intake and coal combustion residuals rules on the AEP fleet. A copy of that presentation is provided in Attachment G. Prior to the July 26, 2011 hearing, AEP used that presentation in briefing Republican and Democratic staff on the impact of the new EPA rules, as well as agency staff at EPA, FERC and the Department of Energy.***

AEP did not perform a rule-by-rule breakdown in isolation, because the only way to optimize the investment decisions required by these multiple proposals with overlapping compliance periods was to examine the potential impacts on a cumulative basis. For example, it would make no sense for AEP to invest capital in a fuel blending system that might allow a unit to achieve sufficient emission reductions to meet the CSAPR SO_2 emissions budget beginning in 2014, if that system would not also allow the unit to meet the mercury, acid gas and particulate emission rates required under the proposed EGU-MACT by the end of that same year. Similarly, it would make no sense for AEP to make major capital investments at a particular unit in order to comply with one of the upcoming EPA rules if AEP would have to retire the unit due to the cumulative impacts of complying with all of the new EPA rules

The data was compiled using the provisions of the EPA proposals, AEP's experience in past retrofit projects, actual numbers of plant employees affected by unit retirements offset by any new jobs available at other AEP units, actual local and state tax impacts, and modeled rate impacts by utility operating company based on existing state law.

b. As you are aware, often compliance with one rule leads to increased

efficiencies that reduce the burden of complying with another rule. Please explain whether AEP's analysis takes into account the efficiencies that will be created through compliance with other requirements. In other words, is AEP double-counting any costs in its estimate of how much compliance with the rules will cost AEP?

Answer: ***As noted above, performing a cumulative analysis was the best means of assuring that any efficiencies were captured as part of the analysis. For example, if a unit retirement was triggered due to the stringent EGU-MACT requirements in 2014, the cost of complying with later compliance obligations under the new EPA rules, or the ongoing fuel and other variable costs associated with operating that unit were eliminated in calculating the anticipated rate impacts in future years.***

c. AEP's analysis focuses on the potential costs of these five rulemakings. However, there are also tremendous benefits associated with each of these rules. For example, the Cross-State Air Pollution Rule is estimated to save 13,000 to 34,000 people from dying prematurely. Did AEP perform any analysis of the potential benefits of these rules? Did you perform any analysis of the specific public health impacts of the pollution from AEP's coal-fired plants, or potential public health benefits that would result from shutting your older plants that do not have modern pollution control technology?

Answer: ***As noted above, the estimated health benefits from CSAPR were calculated using a 2005 base year, and do not treat the reductions made in order to comply with CAIR as permanent reductions. However, AEP and all other affected utility units are currently complying with CAIR, and the ambient air quality benefits associated with those reductions are occurring right now, and will continue to benefit Americans. As demonstrated by the MOG modeling analysis that was noted above in response 2.b, simply continuing upon the course laid out under CAIR would achieve the same air quality benefits as CSAPR, on a similar schedule.***

Moreover, the estimated health benefits of the incremental CSAPR reductions appear to be significantly overstated. The majority of the projected health benefits occur in areas that already meet EPA's health-based ambient air quality standards, and those standards were established to protect human health with an adequate margin of safety. This means that EPA is projecting additional health benefits in many areas of the country where air quality levels are already protective of human health according to EPA's own standards. Furthermore, many of the studies EPA chose not to consider in its health benefit analysis show little or no correlation between power plant emissions and health impacts, and recent research shows that the targeted health benefits are more likely associated with reductions in organic carbon or soot emissions related to transportation sources.

Ms. BUERKLE. Okay. I will yield myself 5 minutes for questions.

First of all, Ms. Henry, I want to give you the opportunity, it seemed to me you had an answer to the ranking member's question that you weren't allowed to give. If you wanted to—early in his line of questioning, he was speaking to you.

Ms. HENRY. If I could continue my response, I would appreciate it. Thank you.

The legislation that AEP was discussing with certain Members of Congress would have provided for a phased-in program to allow sufficient time in order for all of the controls that are required by the various EPA proposals to be phased in over a slightly longer period of time than is proposed under the Cross-State Air Pollution Rule and the Utility MACT Rule.

Instead of having all of the requirements become final and effective in 2014, there would have been an extension through 2020 and a phased-in program with specific levels of control required to be achieved throughout that time period.

Ms. BUERKLE. Thank you.

And this question is for Ms. Henry, as well as Mr. Carey. The EPA time lines to comply with these regulations, is it realistic or unrealistic?

Ms. HENRY. Based on our experience, it is an unrealistic timeframe for the installation of the very sophisticated controls that are necessary to control the types of coals that are produced in many of our States, including Ohio. FGD systems, flue gas desulfurization systems, and SCR systems are required to achieve the levels that are set forth in the EPA regulations for SO_{50} and NO_{120} and also to achieve the co-benefits of mercury reductions from those same power plants.

Ms. BUERKLE. Thank you.

Ms. HENRY. And those require about 4 and a half to 5 years to complete.

Ms. BUERKLE. Mr. Carey.

Mr. CAREY. I would agree with—I would agree with her analysis of how that would affect the power-producing facilities. And what that actually would do for the coal producers of the State would be a removal of us from the marketplace because they simply could not meet the timeframes, as I mentioned, go to a lower sulfur coal and/or possibly switching to natural gas.

Ms. BUERKLE. Can each of you comment just briefly, because I want to get to this line of questioning with regards to these compliance timelines, how many jobs can you estimate would be lost?

Ms. HENRY. Based on the comprehensive analysis that was done by NERA, we estimate that about 1.4 million net job losses would occur in the United States through the time period 2020 as a result of these regulations. And the two regulations we are talking about are the Cross-State Air Pollution Rule and the Utility MACT Rule. The impacts are probably more severe than that based on the final rule because NERA did its analysis on the proposed rule and not the final rule.

Ms. BUERKLE. And if you had more time to comply, would that affect the number of jobs lost?

Ms. HENRY. Yes, it would because we would be able to moderate the electricity rate increases associated with the installation of the controls and spread that over a longer period of time.

Ms. BUERKLE. Thank you.

And the same two questions to you, Mr. Carey.

Mr. CAREY. According—Madam Chair, according to the NERA study, it alone, that loss of those jobs just because of those two proposals, would be 53,000 direct jobs in the State, of which many of those jobs would come from the Appalachian coal fields because of the direct jobs in the mining industry and the up to 11 spin-off jobs that occur from one coal mining job, so the numbers would be significant in that region.

Ms. BUERKLE. And again, if there is longer time for compliance, will that affect the number of jobs lost?

Mr. CAREY. Madam Chair, I think certainly that could affect ultimately the amount of coal that we could continue to put into those power producing facilities, so yes.

Ms. BUERKLE. Thank you.

Now, can either or both of you actually comment on what this will do to electricity rates? You heard in the previous panel of the testimony that it will raise slightly, but I would like to hear your thoughts about what it will do to the electricity rates.

Ms. HENRY. Well, the EPA analysis has been done on an average basis nationwide and not on an individual company basis. Obviously, those companies that are most dramatically impacted by the rules bear the highest cost of compliance, and their rates increase the most.

For the AEP companies, the rate increases we have estimated range from 10 percent at the lowest end of the range to almost 35 percent in those areas most highly impacted.

Ms. BUERKLE. Thank you.

Mr. Carey.

Mr. CAREY. Madam Chair, I think if you look at—in my testimony, I outline what NERA also said, was that if you break it down by State, the average cost for electric rates for certain States across the country, in particular, Ohio is at 13 percent; 23 percent in Tennessee; and 17 percent in Pennsylvania. So you can just go down the list and all of the States would see there will be regional variances in the cost of the electricity increase, but definitely all increasing.

Ms. BUERKLE. Thank you.

I want to ask one more question of the two of you, and then Dr. Schwartz, I don't want you to feel left out here this afternoon.

The EPA is a singular regulatory body and yet we see so many regulations coming out of it from so many various agencies and departments. I would like for you to comment—and Mr. Carey, I can start with you, and then Ms. Henry—have you seen any signs that there is a coordination of or a look at how all of these regulations affect businesses? I mean one regulation by itself may not be bad, but cumulatively, they may devastate businesses, and that is why we are here today, our concern for what this cumulative effect is doing for jobs and job creation. So if you could comment on that, I would appreciate it.

Mr. CAREY. Certainly, Madam Chair. I don't think there is any doubt that we are seeing in the coal fields of not just Ohio, but I think West Virginia, Pennsylvania, Illinois, Kentucky, you are seeing a coordinated attack because the new restrictions on certain coal permits, the fact that the U.S. EPA is getting involved in a lot of the processes that normally would have taken place under the State EPA—or the State permitting program. You are seeing that Federal, that Federal go into the States, start revoking permits, as happened in the State of West Virginia. So what you have is systematically, you have the U.S. EPA not allowing for coal to be permitted to get out of the ground and then ultimately trying to take away the market that the coal could go to. So I guess you could say that the EPA believes that they can control both the laws of supply and demand ultimately to the detriment of the entire country.

Ms. BUERKLE. Thank you.

Ms. Henry.

Ms. HENRY. The EPA regulations are analyzed in a silo.

Each individual requirement is analyzed only for its individual cost and benefits, and there is no comprehensive analysis undertaken. That results in a failure to consider the cumulative impacts at any individual facility, let alone across an industrial sector.

And for an example, the suite of regulations that are currently before us include not only the air pollution regulations, but also the cooling tower requirements and the coal combustion residuals rulemaking. Each of those rules has its own costs, and all of them would be considered by a utility before any investment would be made to determine whether the long-term viability of the facility is justified. So it is essential that EPA not only do cumulative analyses within an individual office or division, like the air division, but that it take a holistic view of all of the regulatory programs that are coming out of the various offices within EPA.

Ms. BUERKLE. Thank you very much.

Dr. Schwartz, in your testimony, you talk a lot about the negative health effects of particulate matter. And I want to clarify if primarily particulate matter is regulated by MACTs? Is that correct?

Mr. SCHWARTZ. Well, there is a MACT for particulate matter, but then there are also new source performance standards and, you know, best available control technology and a bunch of other regulations as well.

The transport rule is primarily being put out to help States come into attainment with the MACTs because we know that particles don't actually stop at State borders. And so the Clean Air Interstate Rule that was originally proposed was for the purpose of doing that. The MACT, I think, is an entirely different thing that has nothing to do with the ambient air quality standard.

Ms. BUERKLE. Well, the concern is that there was a duplication in the count of particulate matter, you know, to make the case, you know.

Mr. SCHWARTZ. Oh. So, I mean, I haven't read every document that EPA has produced, but certainly when EPA did the regulatory impact analysis for the ongoing round of revision of the ambient air quality standards for particles, they said, what if we got particle

levels down to some point and what might be the costs and the benefits of that in their risk assessment.

They didn't specifically propose rules that would accomplish that, but they implicitly assumed that one of the rules that was going to be providing a lot of the help was the transport rule. So if you looked at the benefits of those two things and added them up, that would be incorrect. It would also be incorrect if you looked at the cost of those two things and added it up. The transport rule is one of the strategies that EPA is proposing to help come into attainment with the current MACTs and with any future MACTs. And so it should be a sub category under there for both costs and benefits.

Ms. BUERKLE. Thank you.

Ms. Henry, I want you to comment if you could on whether it is fair that the EPA essentially double counted the benefits.

Ms. HENRY. Madam Vice Chair, I think that the primary objection that we have to EPA's benefits analysis is that for the Cross-State Air Pollution Rule, EPA assumed that current requirements that apply to our facilities under the Clean Air Interstate Rule don't exist, so they started from an artificial baseline and overstated the benefits that would be achieved through the Cross-State Rule.

With respect to the Utility MACT Rule the benefits that are affiliated with reducing the hazardous and toxics air emissions under that rule amount to negligible benefits compared to the costs. The costs are, as I think the chairman stated previously, about $10.7 billion per year, and the benefits are around $50 million associated with reductions in mercury.

EPA claimed it could not quantify any benefits associated with any other individual hazardous air pollutant, but they did quantify benefits associated with reductions in particulate matter, and those are the benefits that they claim are achieved through the reductions of the Utility MACT Rule.

Ms. BUERKLE. Thank you. Mr. Carey would you like to comment on that.

Well, with that, since there are no other members here for questioning, I would like to thank all three of you for being here this afternoon for being willing to answer our questions and to testify.

I think the chairman called this committee. Our concern is always that regulations are putting such burdens on businesses in our country. And given the unemployment rate, we have a responsibility to act responsibly.

And as I mentioned to the previous panel, that no one is saying we don't need regulations, but we need reasonable regulations that don't put companies out of business, that create barriers to their success, that you know, we see compliance and then we see new regulations that require retrofitting. So I thank you all for being here today.

And with that, this hearing is adjourned. Thank you.

[Whereupon, at 4:58 p.m., the subcommittee was adjourned.]

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