

**STATE PERSPECTIVES:
HOW EPA'S POWER PLAN WILL
SHUT DOWN POWER PLANTS**

HEARING
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE, AND
TECHNOLOGY
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTEENTH CONGRESS
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**STATE PERSPECTIVES:
HOW EPA'S POWER PLAN WILL
SHUT DOWN POWER PLANTS**

FRIDAY, SEPTEMBER 11, 2015

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Subcommittee met, pursuant to call, at 9:04 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Jim Bridenstine [Chairman of the Subcommittee] presiding.

LAMAR S. SMITH, Texas
CHAIRMAN

EDDIE BERNICE JOHNSON, Texas
RANKING MEMBER

**Congress of the United States
House of Representatives**

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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Subcommittee on Environment

***State Perspectives: How EPA's Power Plan
Will Shut Down Power Plants***

Friday, September 11, 2015

9:00 a.m. – 11:00 a.m.

2318 Rayburn House Office Building

Witnesses

Dr. Bryan Shaw, Chairman, Texas Commission on Environmental Quality

Mr. Craig Butler, Director, Ohio Environmental Protection Agency

Mr. Jason Eisdorfer, Utility Program Director, Oregon Public Utility Commission

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
HEARING CHARTER**

State Perspectives: How EPA's Power Plan Will Shut Down Power Plants

Friday, September 11, 2015
9:00 a.m. – 11:00 a.m.
2318 Rayburn House Office Building

PURPOSE

The Subcommittee on Environment will hold a hearing entitled *State Perspectives: How EPA's Power Plan Will Shut Down Power Plants* on Friday, September 11, 2015, in Room 2318 of the Rayburn House Office Building. The hearing will examine the U.S. Environmental Protection Agency's (EPA) carbon emissions regulations and the impact of this rule on states.

WITNESS LIST

- **Mr. Craig Butler**, Director, Ohio Environmental Protection Agency
- **Dr. Bryan Shaw**, Chairman, Texas Commission on Environmental Quality
- **Mr. Jason Eisdorfer**, Utility Program Director, Oregon Public Utility Commission

BACKGROUND

On June 2, 2014, EPA proposed the Clean Power Plan with the intent of regulating carbon emissions from existing source electricity generating units.¹ Under Section 111(d) of the Clean Air Act, EPA proposes that states formulate implementation plans to limit carbon emissions.² The scope and manner in which the rule has been conceived by the agency has been met with considerable opposition from many states and other stakeholders.³

The Clean Power Plan would require states to meet requirements for carbon emissions from electricity generating units.⁴ The proposed rule required states to meet the carbon

¹ Clean Power Plan Proposed Rule, U.S. EPA, available at <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>.

² Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34,830 (June 18, 2014), available at <http://www.gpo.gov/fdsys/pkg/FR-2014-06-18/pdf/2014-13726.pdf>.

³ U.S. Chamber of Commerce, Comments on Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generation Units, Dec. 1, 2014, available at https://www.uschamber.com/sites/default/files/12.1.14-comments_to_epa_on_proposed_carbon_emission_standards_for_existing_power_plants_clean_power_plan.pdf; Comment From the Attorneys General of the States of Okla., W. Va., Neb., Ala., Fla., Ga., Ind., Kan., La., Mich., Mont., N.D., Ohio, S.C., S.D., Utah, Wyo. on Proposed EPA Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units available at

<http://www.ok.gov/oag/documents/EPA%20Comment%20Letter%20111d%2011-24-2014.pdf>.

⁴ U.S. EPA, EPA Fact Sheet: Clean Power Plan National Framework for States, available at <http://www2.epa.gov/sites/production/files/2014-05/documents/20140602fs-setting-goals.pdf>.

emissions standard through four Building Blocks: (1) improving the efficiency of coal steam electric generating units by an average of six percent; (2) relying more on combined cycle natural gas units for electricity in peak usage times to a 70 percent capacity factor; (3) constructing more zero and low-emitting power sources; and (4) implementing energy efficiency measures to limit annual electricity demand by 1.5 percent annually.⁵

The EPA announced the final Clean Power Plan rule on August 2, 2015.⁶ The final Clean Power Plan rule is anticipated to be published in the Federal Register in October, the final step before the rule is implemented. The final rule made the following changes to the proposed rule. In Building Block 1, which requires the improved efficiency of existing source power plants, the EPA lowered the required improvement to 4.3 percent per plant. In Building Block 2, which requires the substitution of natural gas for electricity generation, the final rule now assumes that natural gas plants can run at 75 percent of the net summer capacity, an increase from 70 percent. In Building Block 3, requiring the substitution of zero-emissions power sources, the EPA now assumes greater use of renewables than the proposed rule. The highly controversial and legally questionable Building Block 4 requiring states to adopt energy efficiency requirements was removed from the final rule. However, the rule still carves out benefits for states in an effort for them to adopt efficiency measures.

Additionally, the final Clean Power Plan rule created new emissions requirements for each state as compared to the proposed rule. EPA opted for a unified standard in the final rule, reflected in more stringent emissions guidelines for states that rely most heavily on fossil energy for electricity. Western and Midwestern states are required to cut their use of fossil energy the most under this final rule, with over 20 states facing carbon reductions greater than 30 percent of current output.⁷

Recently, the U.S. Energy Information Administration (EIA) produced a report at the request of Chairman Smith that found that EPA's Clean Power Plan would force the retirement of a significant number of coal-fired power plants, increase electricity prices, and decrease American GDP.⁸ On June 24, 2015, the Subcommittees on Environment and Energy held a hearing examining the impacts of the Clean Power Plan as reported by the EIA.⁹

Despite EPA's contention that it has provided states more flexibility to comply with the final rule, at least sixteen states have sued EPA over the Clean Power Plan rule, citing an overreach of the agency's authority under the Clean Air Act and an unlawful attempt to usurp states' ability to regulate electrical generation systems as the basis for their challenge.

⁵ *Id.*

⁶ U.S. EPA, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, Final Rule, available at <http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule.pdf>.

⁷ E&E News Clean Power Plan Hub, available at http://www.eenews.net/interactive/clean_power_plan/updated_total_reduction_percentage.

⁸ U.S. Energy Information Administration, Analysis of the Impacts of the Clean Power Plan, May 2015, available at <http://www.eia.gov/analysis/requests/powerplants/cleanplan/pdf/powerplant.pdf>.

⁹ Information on this hearing is available at: <https://science.house.gov/legislation/hearings/subcommittee-environment-and-subcommittee-energy-hearing-us-energy-information>

Chairman BRIDENSTINE. The Subcommittee on the Environment will come to order.

Without objection, the Chair is authorized to declare recesses of the Subcommittee at any time.

Welcome to today's hearing entitled "State Perspectives: How the EPA's Power Plan Will Shut Down Power Plants." I recognize myself for five minutes for an opening statement.

Today's hearing focuses on the EPA's final Clean Power Plan rule and the tremendous impact that this rule will have on the states upon final implementation. I am very concerned about how this regulation will affect the American economy, more specifically, access to cheap and abundant traditional energy sources as well as affordable and reliable electricity. Today, I look forward to hearing testimony from state regulators about how this rule will specifically impact the citizens of their states.

The negative impacts of EPA's supposed Clean Power Plan are well documented. A few months ago, we heard from industry groups about some of these impacts. The Committee learned that the total compliance costs of the rule could be as high as \$366 billion by the year 2030. Additionally, according to the National Association of Manufacturers, the regulation is projected to cause double-digit electricity price increases in 43 states.

Moreover, the Committee has heard testimony that the EPA is using questionable legal authority to promulgate the Clean Power Plan under section 111 of the Clean Air Act. In fact, Laurence Tribe, leading environmental and constitutional law professor and mentor to President Obama, referred to the method by which this rule was enacted as "burning the Constitution."

This Committee has also heard testimony at previous hearings that the climate benefits from any reductions in carbon emissions realized by the rule will be negligible on a global scale.

Unfortunately, we have a rule that will place tremendous costs on the American people for very little benefit if you believe the models that we've been given by the Administration.

The U.S. Energy Information Administration reaffirmed many of these facts in a report analyzing the impacts of the Clean Power Plan. The Committee heard testimony from Howard Gruenspecht at EIA, who reported that EPA's rule will shut down large numbers of coal-fired power plants, increase electricity prices, and decrease the U.S. GDP.

Many states, including the ones that we have represented before us today have pushed back on the massive overreach of EPA's carbon emission rule. States are uniquely positioned to protect the environment in their states and support their local economies, a key fact the EPA disregarded in promulgating this rule. My home State of Oklahoma, which has been leading the charge against EPA's onerous rule, recognizes that this rule will harm reliability and impose massive costs on its citizens. I applaud Oklahoma's efforts to fight against the EPA and its activist, overbearing regulatory agenda.

This Committee has called many hearings conducting oversight of EPA's regulatory agenda and will continue to do so in order for the American people to understand how this will impact their lives.

I thank all of our witnesses for testifying today and I look forward to hearing about how EPA's final Clean Power Plan will impact your states.

[The prepared statement of Chairman Bridenstine follows:]

PREPARED STATEMENT OF SUBCOMMITTEE ON ENVIRONMENT
CHAIRMAN JIM BRIDENSTINE

Today's hearing focuses on the EPA's final Clean Power Plan rule and the tremendous impact that this rule will have on the states upon final implementation. I am very concerned about how this regulation will affect the American economy; more specifically, access to cheap and abundant traditional energy sources as well as affordable and reliable electricity.

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My home state of Oklahoma, which has been leading the charge against EPA's onerous rule, recognizes that this rule will harm reliability and impose massive costs on its citizens. I applaud Oklahoma's efforts to fight against the EPA and its activist, overbearing regulatory agenda.

This Committee has called many hearings conducting oversight of EPA's regulatory agenda and will continue to do so—in order for the American people to understand how this will impact their lives. I thank all of our witnesses for testifying today and I look forward to hearing about how EPA's final Clean Power Plan will impact your states.

Chairman BRIDENSTINE. I now recognize the Ranking Member, the gentlewoman from Oregon, for an opening statement.

Ms. BONAMICI. Thank you very much, Mr. Chairman, and thank you to all of our witnesses for being here today to discuss the Environmental Protection Agency's Clean Power Plan.

I am especially pleased to welcome Mr. Jason Eisdorfer, a fellow Oregonian. I'm looking forward to learning more about Oregon's work to implement the Clean Power Plan and I'm glad you will discuss some of the successes our state has had in reducing greenhouse gas emissions. I want to say, Mr. Chairman, I'm glad the title is "State Perspectives," plural, because there are different perspectives here.

The mission of the EPA is important yet simple: to protect human health and the environment. And the goal of the Clean Power Plan is equally important and simple: to cut carbon emis-

sions from the largest source, largest source—sorry—the power sector, so that we can lessen the effects of climate change on our states, our country, and our planet.

The Clean Power Plan offers enormous flexibility to states as they tackle their individual carbon emissions targets and the collective goal of reducing carbon emissions by 32 percent by the year 2030. Inaction is unacceptable.

The Pacific Northwest faces risks that Oregonians take very seriously. For example, according to the National Climate Assessment, the snowpack in the Cascade Mountains has decreased by 20 percent compared to 1950, and what snow remains melts about 30 days earlier than usual. These changes are putting additional pressure on the region's water supply. Also the coastline, the health of our commercial fisheries are threatened by rising seas and ocean acidification. Thousands of salmon from the Columbia River died this summer because the water's too warm. These and other changes have the potential to negatively affect not only the safety, but also the economic security of my constituents.

Thankfully Oregon is a state that has been proactive in efforts to mitigate and adapt to climate change. As a result, Oregon can be a resource for states that are just beginning to address this important challenge. As a former member of the Oregon legislature, I helped establish some of the state's carbon emissions reduction goals. For example, in 2007, Oregon set a target of reducing statewide emissions by 75 percent by the year 2050. We also set the goal of having up to 25 percent of our energy generated through renewable sources by 2025. These efforts and others have put Oregon in a position to not only meet, but likely surpass, its Clean Power Plan carbon reduction goal, and all of that while maintaining a healthy and vibrant economy.

Oregon is a leader in renewable energy technology and many businesses have developed new products that add jobs to our economy and are energy efficient. One innovative example is Lucid Energy, which has developed technology to generate electricity through a hydropower system in existing city water pipes.

Some today will likely contend that regulating carbon hurts the economy. But a recent report by Citi GPS adds to the growing body of evidence showing that this is simply not the case. The report states: "We are not climate scientists, nor are we trying to take sides in the global warming debate; rather we are trying to take an objective look at the economics of the discussion, to assess the incremental costs and impacts of mitigating the effects of emissions, to see if there is a solution which offers global opportunities without penalizing global growth." The authors conclude: "The incremental costs of following a low-carbon path are in context limited and seem affordable. The return on that investment is acceptable and, moreover, the likely avoided liabilities are enormous." When you have climate scientists and economists agreeing that action to address climate change is necessary and that the benefits outweigh the risks, then it is time for our country to stop dragging its feet and to move forward as a Nation and a global leader.

The Clean Power Plan builds on the efforts of states like Oregon by creating a unified, national approach to our biggest environmental challenge. The Clean Power Plan represents an opportunity

for American ingenuity that will allow us to benefit from the much-needed transition to a low-carbon economy.

Thank you, Mr. Chairman, and again thank you to our witnesses for being here this morning, and I do want to ask that the Citi GPS report from which I quoted be entered into the record.

Chairman BRIDENSTINE. Without objection, so ordered.

[The information appears in Appendix II]

Ms. BONAMICI. Thank you, Mr. Chairman, and I yield back the balance of my time.

[The prepared statement of Ms. Bonamici follows:]

PREPARED STATEMENT OF SUBCOMMITTEE ON OVERSIGHT
MINORITY RANKING MEMBER SUZANNE BONAMICI

Thank you, Mr. Chairman, and thank you to our witnesses for being here today to discuss the Environmental Protection Agency's Clean Power Plan. I am especially pleased to welcome Mr. Jason Eisdorfer, a fellow Oregonian. I'm looking forward to learning more about Oregon's work to implement the Clean Power Plan and I'm glad you will discuss some of the successes our state has had in reducing greenhouse gas emissions.

The mission of EPA is important yet simple—to protect human health and the environment. The goal of the Clean Power Plan is equally important and simple—to cut carbon emissions from the largest source, the power sector, so that we can lessen the effects of climate change on our states, our country, and our planet.

The Clean Power Plan offers enormous flexibility to states as they tackle their individual carbon emission targets and the collective goal of reducing carbon emissions by 32 percent by the year 2030.

Inaction is unacceptable. The Pacific Northwest faces risks that Oregonians take very seriously. For example, according to the National Climate Assessment, the snowpack in the Cascade Mountains has decreased by 20 percent compared to 1950, and what snow remains melts about 30 days earlier than usual. These changes are putting additional pressure on the region's water supply.

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The authors conclude: "the incremental costs of following a low carbon path are in context limited and seem affordable, the 'return' on that investment is acceptable and moreover the likely avoided liabilities are enormous."

When you have climate scientists and economists agreeing that action to address climate change is necessary and that the benefits outweigh the risks, then it is time

for our country to stop dragging its feet and to move forward as a nation and a global leader.

The Clean Power Plan builds on the efforts of states like Oregon by creating a unified, national approach to our biggest environmental challenge. The Clean Power Plan represents an opportunity for American ingenuity that will allow us to benefit from the much needed transition to a low carbon economy. Thank you, Mr. Chairman, and again thank you to our witnesses for being here this morning. I yield back the balance of my time.

Chairman BRIDENSTINE. Thank you, Ms. Bonamici.

I now recognize the chairman of the full Committee, Mr. Smith.

Chairman SMITH. Thank you, Mr. Chairman, and thank you also for holding this hearing today.

Over the last year, the Environmental Protection Agency has released some of the most expensive and burdensome regulations in its history. These rules will cost billions of dollars, place a heavy burden on American families, and diminish the competitiveness of American workers around the world.

Today's hearing will examine the Clean Power Plan and the manner in which EPA has used secret science, questionable legal interpretations, and flawed analysis to place tremendous and unlawful burdens on the states, and yet, despite these issues, this Administration continues to force costly and unnecessary regulations on hardworking American families. On August 3rd, the Obama Administration ignored the outcry from stakeholders and the American public when it issued the final rule on its Power Plan. The Clean Air Act was never intended to regulate carbon. This final rule is another example of the President and his Environmental Protection Agency sidestepping Congress to push an extreme agenda.

It is well documented that the final plan will shut down power plants across the country, increase electricity prices, and cost thousands of Americans their jobs. My home State of Texas would be one of the hardest hit. The state would be forced to close affordable coal-fired power plants, which also provide reliable electricity during peak usage times in the summer. Additionally, the rule will cause double-digit electricity price increases across the United States.

Despite EPA's statements to the contrary, this rule goes well beyond the regulation of power plants, even reaching down into Americans' homes to control electricity use. Higher energy prices means the price of everything will increase, and low-income families already struggling to make ends meet will be among those most burdened by this costly rule. The so-called Clean Power Plan is simply a power grab that will force states to try to reach arbitrary and often impossible targets for carbon emissions.

EPA asserts that the Clean Power Plan will help combat climate change. However, EPA's own data demonstrates that is false. The data shows that this regulation would reduce sea-level rise by only 1/100th of an inch, the thickness of three sheets of paper. This rule represents massive costs without significant benefits. In other words, it's all pain and no gain. Under the Clean Power Plan, Americans will be subject to the constant threat of government intervention so the onslaught of EPA regulations continues.

I look forward, Mr. Chairman, to today's hearing and to hearing from the witnesses about the impact of these burdensome EPA regulations on their states, and I yield back.

[The prepared statement of Chairman Smith follows:]

PREPARED STATEMENT OF COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
CHAIRMAN LAMAR S. SMITH

Over the last year, the Environmental Protection Agency (EPA) has released some of the most expensive and burdensome regulations in its history. These rules will cost billions of dollars, place a heavy burden on American families and diminish the competitiveness of American industry around the world.

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This rule represents massive costs without significant benefits. In other words, it's all pain and no gain. Under the Clean Power Plan, Americans will be subject to the constant threat of government intervention. The onslaught of EPA regulations continues.

I look forward to hearing from today's witnesses about the impact of these burdensome EPA regulations on their states.

Chairman BRIDENSTINE. Thank you, Chairman Smith.

I will now recognize the Ranking Member of the full Committee for her statement.

Ms. JOHNSON OF TEXAS. Good morning, Mr. Chairman, and thank you to all of our witnesses who are here.

EPA's Clean Power Plan is a step in the right direction. The scientific evidence shows we cannot afford to wait, but must act now if we are to stand a chance of lessening the impacts of climate change. Record temperatures, an increase in heavy rain events, and rising seas are a few examples of what Americans are confronting now and can expect to see more frequently in the coming years.

As the largest source of carbon pollution, cutting emissions from power plants is the key to any solution. This is why I am supportive of the Clean Water Plan—Clean Power Plan and its goal to reduce carbon emissions by 32 percent by 2030 from the power

sector. The final rule we will be discussing today is responsive to more than four million public comments received by EPA. It sets reasonable limits that take into account the characteristics of each state. It provides states with an additional two years to formulate and implement their compliance plans. It responds to concerns about grid reliability by including a reliability safety valve and requiring states to consider reliability concerns in their state implementation plans. And finally, the central feature of the rule is the enormous flexibility it provides to states.

EPA is not prescribing a specific set of measures, but instead, states will choose what goes into their plans, and they can work alone or as part of a multi-state effort to achieve meaningful carbon reductions.

Today, I suspect that we will hear some of the same old arguments about the Clean Power Plan that we hear about nearly every regulation issued by the EPA: that it will cause nothing but harm to our economy, that the federal government is overstepping its authority, that the rule is unnecessary, and that it won't make any difference in the long run.

However, we know that these assertions are just not true. Rather, as history has shown us time and again, stricter pollution limits have invariably led to innovation and the creation of new technologies that end up creating jobs while protecting our environment. I am confident American industry will continue this record of innovation and job creation as the Clean Power Plan is implemented.

Additionally, and perhaps, most importantly, the Clean Power Plan sends a strong and much needed signal to the rest of the world about the seriousness of the United States in addressing climate change. Such a position is critical to meaningful international engagement on this issue.

I recognize that implementing the Clean Power Plan will not be easy, and that there are real costs associated with transitioning to a low-carbon economy. But the bottom line is that the costs of inaction are even greater.

I look forward to today's discussion and to hearing more about how we can achieve the emissions targets in the Clean Power Plan.

I thank you, and yield back the balance of my time.

[The prepared statement of Ms. Johnson of Texas follows:]

PREPARED STATEMENT OF COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
RANKING MEMBER EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman, and thank you to our witnesses for being here this morning.

EPA's Clean Power Plan is a step in the right direction at the right time. The scientific evidence shows we cannot afford to wait, but must act now if we are to stand a chance of lessening the impacts of climate change. Record temperatures, an increase in heavy rain events, and rising seas are a few examples of what Americans are confronting now and can expect to see more frequently in the coming years.

As the largest source of carbon pollution, cutting emissions from power plants is the key to any solution. This is why I am supportive of the Clean Power Plan and its goal to reduce carbon emissions by 32 percent by 2030 from the power sector.

The final rule we will be discussing today is responsive to the more than 4 million public comments received by EPA. It sets reasonable limits that take into account the characteristics of each state. It provides states with an additional two years to formulate and implement their compliance plans. It responds to concerns about grid

reliability by including a “reliability safety valve” and requiring states to consider reliability concerns in their state implementation plans.

And finally, the central feature of the rule is the enormous flexibility it provides to states. EPA is not prescribing a specific set of measures, but instead, states will choose what goes into their plans, and they can work alone or as part of a multi-state effort to achieve meaningful carbon reductions.

Today, I suspect that we will hear some of the same old arguments about the Clean Power Plan that we hear about nearly every regulation issued by the EPA. That it will cause nothing but harm to our economy. That the federal government is overstepping its authority, that the rule is unnecessary, and that it won’t make any difference in the long-run.

However, we know that these assertions are just not true. Rather, as history has shown us time and again, stricter pollution limits have invariably led to innovation and the creation of new technologies that end up creating jobs while protecting our environment. I am confident American industry will continue this record of innovation and job creation as the Clean Power Plan is implemented.

Additionally, and perhaps, most importantly, the Clean Power Plan sends a strong and much needed signal to the rest of the world about the seriousness of the United States in addressing climate change. Such a position is critical to meaningful international engagement on the issue.

I recognize that implementing the Clean Power Plan will not be easy, and that there are real costs associated with transitioning to a low carbon economy. But the bottom line is that the costs of inaction are even greater. I look forward to today’s discussion and to hearing more about how we can achieve the emissions targets in the Clean Power Plan.

Thank you and I yield back the balance of my time.

Chairman BRIDENSTINE. Thank you, Ranking Member Johnson.

And now to introduce our first witness, the Chairman of the Texas Commission on Environmental Quality, Dr. Bryan Shaw, I yield to the Chairman of the full Committee, Mr. Smith.

Chairman SMITH. Thank you, Mr. Chair, and let me say it’s nice to be able to welcome a Texas colleague.

Chairman Shaw was appointed to the Texas Commission on Environmental Quality (TCEQ) in 2007. Since then, he has served on the Texas Environmental Flows Advisory Group and is Chair of the Texas Advisory Panel on Federal Environmental Regulations. He was appointed Chairman in 2009. Prior to joining the TCEQ, Chairman Shaw served as a member of the U.S. Environmental Protection Agency’s Science Advisory Board Committee on Integrated Nitrogen. He also served on the Environmental Protection Agency SAB Environmental Engineering Committee and the Ad Hoc Panel for Review of EPA’s Risk and Technology Review Assessment Plan. Additionally, he is a member of the U.S. Department of Agriculture’s Agricultural Air Quality Task Force. In addition to his chairmanship, Dr. Shaw serves as an Associate Professor in the Biological and Agricultural Engineering Department of Texas A&M University. His research there focuses on air pollution, air pollution abatement, dispersion model development, and emission factor development. Chairman Shaw received his bachelor’s and master’s degrees in agricultural engineering from Texas A&M and his Ph.D. in agricultural engineering from the University of Illinois at Urbana-Champaign.

Thank you, Mr. Chairman, and I’m pleased that Chairman Shaw is here to testify.

Chairman BRIDENSTINE. Thank you, Chairman Smith.

I will now yield to the gentleman from Ohio, Mr. Johnson, to introduce our next witness, Mr. Craig Butler, Director of the Ohio Environmental Protection Agency.

Mr. JOHNSON OF OHIO. Thank you, Mr. Chairman, and it is indeed my distinct pleasure to introduce Director Craig Butler, the Director of Ohio's Environmental Protection Agency. Director Butler received his bachelor's degree in geography and environmental science from Mansfield University and his master's degree in environmental science from Ohio University. Craig and his team have done some tremendous work for Ohio. The respect that they have earned from people across our state both within the energy sector and in the state agencies is clear. Their high standards of an exceptional work ethic is evident in everything that they do. For instance, the comments that Director Butler and his agency submitted to the U.S. EPA in response to the Clean Power Plan proposal are viewed by many as some of the most detailed, extensive and informative comments that the U.S. EPA received regarding this regulation. They clearly highlighted the many shortcomings of the Clean Power Plan, such as its potential impact on grid reliability and energy costs.

Director Butler, I want to personally thank you for being here today. I wish I could stay and hear the entire testimony but with it being the last day of the week, we have multiple hearings in conflict, and so I've got to go to another hearing that is getting underway as we speak. But I want to reiterate, thank you so much. The work you're doing in Ohio and the example that you're setting across the Nation, boy, I sure we could get along and work out a working relationship with the federal EPA the way that we've done it in Ohio. You're to be commended, and I welcome you.

Chairman BRIDENSTINE. Thank you, Mr. Johnson.

Our final witness today is Mr. Jason Eisdorfer, Utility Program Director for the Oregon Public Utility Commission, and I'd like to yield to the Ranking Member, Ms. Bonamici, for an introduction.

Ms. BONAMICI. Thank you very much, Mr. Chairman.

It's my honor to introduce a fellow Oregonian, Mr. Jason Eisdorfer, who has served as the Utility Program Director of the Oregon Public Utility Commission since 2012. He oversees a staff of approximately 77 employees and provides direction to formulate policies, recommendations and practices regarding the regulation of investor-owned utility, natural gas, water and telecommunications utilities. Previously, Mr. Eisdorfer was the Interim Director of Strategy Integration at the Bonneville Power Administration, a federal power marketing administration, and before that, he served as BPA's Greenhouse Gas Policy Advisor. In this role, he served as the Senior Advisor to the Agency on Policies and Programs Related to Climate Change. He served as Legal Counsel and Energy Program Director of the Citizens Utility Board of Oregon for 13 years. He has coauthored state legislation related to climate change and electric utility restructuring and operations including the Electricity Restructuring Law in 1999 and the Oregon Renewable Energy Act and Climate Change Integration Act, both of 2007, and more recently he has advised on additional state legislation concerning storage technology pilots and natural gas utility carbon reduction programs. Mr. Eisdorfer has served as an Adjunct Professor of Law at both the University of Oregon School of Law and the Northwestern School of Law at Lewis and Clark College teaching classes on energy law and climate change and policy. He is a

graduate of the University of Chicago and he received his law degree, as I did, from the University of Oregon. Go Ducks.

Thank you for joining us today, Mr. Eisdorfer.

Chairman BRIDENSTINE. Thank you, Ranking Member Bonamici.

In order to allow time for discussion—we're going to move to witness testimonies—please limit your testimony to five minutes. Your entire written statement will be made a part of the official record.

I now recognize Chairman Shaw for five minutes to present his testimony.

**TESTIMONY OF DR. BRYAN SHAW, CHAIRMAN,
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**

Dr. SHAW. Mr. Chairman, Ranking Member Bonamici and Members of the Committee, thank you for the opportunity to be here, and good morning. A special thank you to Chairman Smith for the kind introduction.

My name is Dr. Bryan Shaw. I'm the Chairman of the Texas Commission on Environmental Quality. As the leader of this agency, my job is to ensure we carry out our mission, which is to mitigate environmental risk while basing all of our regulations on sound science and compliance with state and federal statutes. In every case where Texas disagrees with EPA actions, it is because EPA's actions are not consistent with these principles.

As you know, the EPA's Clean Power Plan for existing power plants was signed by the EPA Administrator on August 3, 2015, and is currently awaiting publication in the Federal Register. The final version of the Clean Power Plan is radically different than EPA's proposed plan, and as such, the TCEQ is continuing to study and evaluate the impacts of the final rule.

Currently, the following concerns associated with the rule have been identified. First, EPA's methodology for determining the Best System of Emission Reduction, or BSER, in this Rule marks a radical departure from historical practice, and, I would argue, the plain language of the Clean Air Act. Specifically, the EPA has now asserted the power to determine Best System of Emission Reduction by evaluating technologies and methods outside the fence of the facilities it claims to be regulating. This is the first time the EPA has not determined this BSER based on technology or methods that could be applied to the source itself or materials being used by the source. In the past, Best System of Emissions Reduction evaluations have included installing scrubbers, low-emission combustion technology, pretreatment of fuels, and myriad other systems that a facility operator actually can control. But in this case, the EPA has evaluated states' electric grids and energy policies as a whole, instead of the individual sources which it has authority to regulate under Section 111(d) of the Clean Air Act.

The final Clean Power Plan establishes national performance rates for two subcategories, steam generating units and stationary combustion turbines, applying three building blocks as BSER. While the final rule allows states to use—to elect to use alternate statewide goals, these goals are derived from the same performance rates. However, only the first of these blocks, Building Block 1, or the heat rate improvement, those efficiency improvements on existing coal-fired power plants, is within the historical approach of how

EPA has determined BSER in the past. Block 2, which is redispatching generation from steam-generating units to natural gas combined cycle units, and Block 3, increased renewable energy, rely on the assumption of other generating units increasing their generation, generating units in which most circumstances are not located in the same area, and for most forms of renewable energy, are not even subject to the Federal Clean Air Act. In effect, EPA is setting standards for existing power plants based on the method of electric generation they prefer, not on the control technology or methods that can be feasibly applied to the existing sources.

Another major concern is that the final Clean Power Plan has an insignificant effect on global carbon dioxide concentrations, global temperatures, and sea-level rise. The final rule does not provide a single quantifiable climate benefit. EPA's purported climate benefits are based solely on the Office of Management and Budget's Social Cost of Carbon and their claim that it will put the United States in a stronger bargaining position at the President's upcoming climate summit in December. Aside from the obvious substantive objections I have to this line of reasoning, I submit to you that a regulation this expensive that entails such an unprecedented arrogation of power to the Executive Branch cannot be justified as a bargaining chip or with fuzzy math.

Furthermore, the EPA is deceiving the American public by claiming wildly inflated economic benefits only tangentially related to the purpose of the rule. The rest of EPA's claimed benefits from the rule are actually co-benefits from reductions of non-GHG, non-greenhouse-gas, pollutants such as nitrogen oxides and sulfur dioxide, and even these benefits are suspect. Not only are criteria pollutants not the purpose of the final Clean Power Plan, the majority of claimed co-benefits are due to changes in ambient concentrations of ozone and PM2.5 in areas that are already attaining the National Ambient Air Quality Standards for these criteria pollutants, so it is irrational for the EPA to claim a health benefit from reduction in a pollutant in areas where the EPA has already determined that the current concentration of the pollutant is adequate to protect human health. In areas not attaining this standard, there are other rules in the Clean Air Act requires those states to develop plans to address those and bring them into compliance.

So one final issue before I close would be a more technical concern about leakage that the EPA has included in the final rule. "Leakage" is the shift of generation from existing units to new units that are not subject to the Clean Power Plan. This results in a net increase in emissions, and the EPA is requiring states that choose to use a mass-based approach must address this leakage. Also, they propose to address that in the federal plan if that federal plan includes a mass-based approach. EPA's motivation for its leakage policy is to remedy the nonsensical situation that emission standards for existing fossil fuel units under 111(d) are much more stringent than the standards for new fossil fuels under 111(b), that is, it would have a more stringent standard for existing sources than for new, and this makes that very detrimental and unworkable moving forward.

So it's important for me to bring this forward, and I thank you for the opportunity to testify today.

[The prepared statement of Mr. Shaw follows:]

The Committee on Science, Space, and Technology
September 11, 2015
Testimony of Dr. Bryan W. Shaw, Chairman of the TCEQ

Mr. Chairman, Ranking Member Bonamici, members of the committee:

Good morning, and thank you for the opportunity to talk to you today about the EPA's final Clean Power Plan. My name is Dr. Bryan Shaw, and I am the Chairman of the Texas Commission on Environmental Quality. As the leader of this agency, my job is to ensure we carry out our mission to mitigate environmental risks, while basing all of our regulations on sound science and compliance with state and federal statutes. In every case where Texas disagrees with EPA's actions, it is because EPA's actions are not consistent with these principles.

As you know, the EPA's final Clean Power Plan for existing power plants was signed by the EPA Administrator on August 3, 2015, and is currently awaiting publication in the Federal Register. The final version of the Clean Power Plan is radically different than the EPA's proposal and as such, the TCEQ is continuing to study and evaluate the impacts of the final rule. Currently, the following concerns with the rule have been identified.

First, EPA's methodology for determining the "Best System of Emission Reduction" in this Rule marks a radical departure from historical practice, and, I would argue, the plain language of the Clean Air Act.

Specifically, the EPA has now asserted the power to determine BSER by evaluating technologies and methods "outside the fence" of the facilities it claims to be regulating. This is the first time the EPA has not determined BSER based on technology or methods that could be applied to the source itself or materials being used by the source. In the past, BSER evaluations have included installing scrubbers, low emission combustion technology, pretreatment of fuels, and myriad other systems that a facility operator can control.

But in this case, the EPA has evaluated States' electric grids and energy policies as a whole, instead of the individual sources which it has authority to regulate under §111(d). The final Clean Power Plan establishes national performance rates for two subcategories, steam generating units and stationary combustion turbines, by applying three building blocks as BSER. While the final rule allows states to elect to use alternate statewide goals, these goals are derived from the same performance rates. However, only the first of these blocks, Block 1 or heat rate improvement at existing coal-fired power plants, is within the historical approach of how EPA has determined BSER. Block 2, redispatching generation from steam generating units to natural gas combined cycle units, and Block 3, increased renewable energy, rely on the assumption of other generating units increasing generation; generating units which in most circumstances are not located at the same site and, for most forms of renewable energy, are not even subject to the Federal Clean Air Act. In effect, EPA is setting standards for existing power plants based on the method of electric generation they prefer, not on the control technology or methods that can be feasibly applied to existing sources.

Another major concern is that the final CPP will have an insignificant effect on global carbon dioxide concentrations, global temperatures, and sea level rise. The final rule does not provide a single quantifiable climate benefit. EPA's purported climate benefits are based solely on the Office of Management and Budget's Social Cost of Carbon (SCC), and their claim that it will put the United States in a stronger bargaining position at the President's upcoming climate summit in December. Aside from the obvious substantive objections I have to this line of reasoning, I submit to you that a regulation this expensive that entails such an unprecedented arrogation of power to the Executive Branch can not be justified as a bargaining chip or with fuzzy math.

Furthermore, the EPA is deceiving the American public by claiming wildly inflated economic benefits only tangentially related to the purpose of the rule. The rest of EPA's claimed benefits from the rule are actually co-benefits from reductions of non-GHG pollutants such as nitrogen oxides and sulfur dioxide and even these benefits are suspect. Not only are criteria pollutants not the purpose of the final Clean Power Plan, the majority of claimed co-benefits are due to changes in ambient concentrations of ozone and PM_{2.5} in areas that are already attaining the NAAQS for these criteria pollutants. It is irrational for the EPA to claim a health benefit from reduction in a pollutant in areas where the EPA has already determined that the current concentration of the pollutant is adequate to protect human health. In areas not attaining the NAAQS for criteria pollutants, states have already or will be required to submit a State Implementation Plan (SIP) to bring those areas into compliance.

A more technical concern is the concept of "leakage" that the EPA has included in the final rule. "Leakage" is the shift of generation from existing units to new units that are not subject to the Clean Power Plan, resulting in a net increase in emissions. The EPA is requiring states that choose to use a mass-based approach must address "leakage" in their state plan; EPA also proposed to address "leakage" in their proposed federal plan, if they decide to use a mass-based approach. EPA's motivation for its "leakage" policy is to remedy the nonsensical situation that emission standards for existing fossil fuel units under §111(d) are much more stringent than the standards for new fossil fuel units under §111(b). If EPA had followed the approach for determining BSER for existing units that it has used in all previous §111(d) rules and set BSER and the standards of performance appropriately, this issue would not even exist. Worse, this requirement would seem to only encourage companies to keep older, less efficient power plants operating longer, which ultimately could result in a less efficient and less reliable power generation fleet.

The Rule's provision allowing states to request up to a two-year extension will do nothing to help the State of Texas implement the Rule. The time for states to make decisions whether to submit a state plan and what approach that plan might take, and then to develop a state plan is still a significant concern. The next scheduled meeting of the Texas Legislature isn't until 2017. Any state plan for the Clean Power Plan will fundamentally affect state energy policy. If the Texas Legislature wanted to give specific direction on the implementation of a state plan, practically speaking, 2017 is too late. In order to have adequate time to develop a state plan, TCEQ estimates that decisions regarding the approach taken in a state plan would need to be made by late 2016. Essentially, the EPA's schedule for the Clean Power Plan may force the Texas Legislature to have a special session, which would come at a substantial cost to the state.

So, the Clean Power Plan is based on technologies and methods that are impractical and were illegal for the EPA to consider in the first place. The EPA's "outside the fence" approach disregards precedent and the plain meaning of the Clean Air Act. The rule is still riddled with technical flaws that make it impractical and/or impossible to implement, and the EPA has not given states, especially Texas, nearly enough time to formulate and submit a state plan. And all this when even the EPA acknowledges that this rule will not have a single discernible impact on climate change or sea level rise. I would be derelict in my duty to protect the TCEQ's mission that I previously mentioned if I did not make plain this Rule's shortcomings.

Bryan W. Shaw, Ph.D., P.E.

Dr. Bryan W. Shaw of Elgin was appointed to the Texas Commission on Environmental Quality by Gov. Rick Perry on Nov. 1, 2007. The Texas Senate confirmed his appointment on May 5, 2009 and he was appointed chairman on Sept. 10, 2009.



Shaw is an associate professor in the Biological and Agricultural Engineering Department of Texas A&M University (TAMU) with many of his courses focused on air pollution engineering. The majority of his research at TAMU concentrates on air pollution, air pollution abatement, dispersion model development and emission factor development. Shaw was formerly associate director of the Center for Agricultural Air Quality Engineering and Science, and formerly served as Acting Lead Scientist for Air Quality and Special Assistant to the Chief of the U.S. Department of Agriculture Natural Resources Conservation Service.

Shaw served as a member of the U.S. Environmental Protection Agency (EPA) Science Advisory Board (SAB) Committee on Integrated Nitrogen, as well as the EPA SAB Environmental Engineering Committee and the Ad Hoc Panel for review of EPA's Risk and Technology Review Assessment Plan. Additionally, he is a member of the U.S. Department of Agriculture–Agricultural Air Quality Task Force. Since his appointment to the TCEQ, Shaw has served on the Texas Environmental Flows Advisory Group and as chair of the Texas Advisory Panel on Federal Environmental Regulations.

Shaw received a bachelor's and master's degree in agricultural engineering from TAMU and a doctorate degree in agricultural engineering from the University of Illinois at Urbana-Champaign.

Chairman BRIDENSTINE. Thank you, Chairman Shaw.
 Director Butler, you are recognized for five minutes.

**TESTIMONY OF MR. CRAIG BUTLER, DIRECTOR,
 OHIO ENVIRONMENTAL PROTECTION AGENCY**

Mr. BUTLER. Chairman Bridenstine, Ranking Member Bonamici, Members of the Subcommittee, and in particular, Representative Bill Johnson, thank you. My name is Craig Butler, and I'm Director at Ohio EPA, the Environmental Protection Agency in Ohio. Thanks for the opportunity to provide testimony on the now-final Clean Power Plan issued by the U.S. Environmental Protection Agency.

When I provided testimony back in March in the House Subcommittee on Energy and Power, the CPP was only a proposal, and U.S. EPA was in the process of collecting and evaluating what turned out to be over 4.3 million comments, and while we continue to review the final rule presented by U.S. EPA, our fundamental and legal technical concerns persist or continue to grow.

Ohio has striven to revive its manufacturing output over the last few years. Driven by affordable and reliable power, countless energy-intensive industries including auto manufacturing, steel, glass production and iron reside in Ohio. This manufacturing rebound has been due in no small part to the shale gas production in the eastern part of the state, and like our locally mined coal, provides a foundation for predictable and relatively stable low-cost power to industries and citizens in the State of Ohio.

While working to revive our manufacturing output, we have achieved significant emission reductions from our coal-fired power plants. Between 2005 and 2014, carbon dioxide emissions from these units were reduced by approximately 30 percent. Given these reductions, one might think that Ohio is well on a path to comply with the final CPP.

Unfortunately, U.S. EPA suggests using a baseline for emission reductions is 2005, but in reality they're using 2012, meaning that any reductions prior to that are not being considered for compliance with our mandated reduction target.

Ohio's coal fleet has and will continue to improve its operational efficiency, however, requiring additional pollution control measures will be extremely costly and will undermine the long-term viability of these plants.

Ohio has experienced a dramatic loss in generating capacity, losing some 6,100 megawatts between years 2010 and 2015, primarily due to U.S. EPA's Mercury and Air Toxics Standard. A further reduction in usage of coal-fired generation is the biggest means for complying with the final CPP and is a serious concern with respect to end-user costs, infrastructure and reliability.

As mentioned, on August 3rd, EPA released three rules that will have an adverse effect on coal-based electricity generation across the country. Finalizing emissions standards for new electronic generation units was the first rule released and created a reliance on cost-prohibitive technology that will effectively prevent any new coal plants from being built across the country. Carbon capture and sequestration, the only technology described in that rule, is provided—is proving to not be ready for wide-scale technical imple-

mentation. Costs are escalating to the point where even with heavy subsidization, projects are being abandoned.

The second and third rules work together. The second rule is the final version of the CPP and the third rule is a proposed back stop or federal plan for states that are unable to or choose not to comply with the final CPP. These rules will result in an unprecedented overhaul of the power generation, transmission systems by dramatically reducing fossil-fuel-based power generation and establishing aggressive new renewable targets. These rules together circumvent Congressional authority by creating a large-scale program to revamp the power industry and replace the long-standing economic model for generation of electricity based on an environmental model.

U.S. EPA made certain changes in response to comments on the proposed CPP. U.S. EPA is evident, however, it raised the rule's carbon emissions reduction from 30 percent to 32 percent. In Ohio, our mandated target is now roughly 11 percent more aggressive than the proposed rule, meaning Ohio will need to lower its carbon emission rate by 37 percent between 2012 and the final plan.

The final CPP dictates that natural gas generation be deployed at 75 percent capacity factor. Updated cost projections using the final rule haven't been completed but our Public Utilities Commission conducted an analysis of the proposed rule, estimating a 70 percent capacity factor and predicted wholesale energy prices to be 39 percent higher in calendar year 2025, costing Ohioans \$2.5 billion more than projected.

U.S. EPA has made profound changes to the rule. The number, the nature, and the overall level of wholesale changes drive Ohio to call for U.S. EPA to rerelease the final CPP as a proposed action allowing interested parties an opportunity to review and provide comment.

On numerous occasions, EPA and the DC. Circuit Court of Appeals and the State of Ohio have pointed out serious legal shortcomings. This is why Governor Kasich has written a letter to the President asking to stay the implementation of the rule and all legal appeals—until all legal appeals have been resolved.

I strongly believe that the CPP is not the answer, and with unresolved legal challenges, along with substantial changes between the draft and final proposal, U.S. EPA should hold off on implementing this plan until legal challenges are resolved or reissue the final plan as a proposed action.

Thank you for the opportunity to testify, and I'm happy to answer any questions.

[The prepared statement of Mr. Butler follows:]



John R. Kasich, Governor
 Mary Taylor, Lt. Governor
 Craig W. Butler, Director

**Testimony of Craig Butler
 Director of Ohio EPA
 Before the U.S. House of Representatives
 Committee on Science, Space and Technology
 Subcommittee on Environment
 September 11, 2015**

Chairman Bridenstine, Ranking Member Bonamici and members of the Subcommittee, my name is Craig Butler, Director of the Ohio Environmental Protection Agency (Ohio EPA). Thank you for the opportunity to provide testimony on the now final Clean Power Plan (CPP) issued by the United States Environmental Protection Agency (U.S. EPA).

When I provided testimony back in March to the House Subcommittee on Energy & Power, the CPP was only a proposal and U.S. EPA was in the process of collecting and evaluating what turned out to be over 4.3 million comments. While we continue to review the final rule presented by U.S. EPA on August 3, our fundamental legal and technical concerns persist or continue to grow. The new data, assumptions and strategy used to develop the final CPP are different and have led to completely revised state compliance targets. This, in short, means that states can't rely on analyses used to review the proposed CPP but rather need to re-launch a new effort to assess the final version.

Ohio has striven to revive its manufacturing output over the last few years. Driven by affordable and reliable power, countless energy intensive industries including auto manufacturing, iron, steel, and glass production reside in Ohio. In 2012, Ohio had the 6th highest energy consumption in the United States with 50 percent dedicated to industry and manufacturing. In the PJM Interconnection Region consisting of 13 states and Washington, DC, Ohio uses a full 20 percent of the total energy load. This manufacturing rebound has been due in no small part to the shale-gas production in the eastern part of the state, and like our locally-mined coal, provides a foundation for predictable and relatively stable low-cost power to industries and citizens across the state.

While working to revive our manufacturing output, Ohio has achieved significant emission reductions from our coal-fired power plants. Between 2005 and 2014, carbon dioxide emissions from these units were reduced by approximately 30 percent. Given these reductions, one would think that Ohio is well on a path to comply with the final CPP. Unfortunately, while U.S. EPA suggests using a baseline for emission reductions is 2005, in reality they use 2012, meaning that any reductions prior to 2012 are not being considered for compliance with Ohio's mandated reduction targets. Ohio's coal fleet has and will continue to improve its operational efficiency;

however requiring additional pollution control measures will be extremely costly and will undermine the long-term viability of these power plants.

Ohio has already experienced a dramatic loss in generating capacity, losing some 6,100 MW between years 2010 and 2015, primarily due to U.S. EPA's Mercury and Air Toxics Standards. A further reduction in usage of coal-fired generation is the biggest means for complying with the final CPP and is a serious concern with respect to end-user costs, infrastructure and reliability.

Ohio has benefited from an "all fuels" approach to power generation, utilizing not only coal or renewable energy, but natural gas, hydroelectricity and energy efficiency. States like Ohio are aggressively advancing all forms of energy without picking winners and losers and are taking the lead to be protective of both the environment and consumers. This strategy ensures access to affordable and reliable energy across the state for citizens, manufacturing, business and industry. However, through trading-ready state plans or a federally driven market-based trading program, U.S. EPA plans to mandate significant expansion of renewable generation across the country - regardless of practicality or cost.

On August 3rd, U.S. EPA released three rules that will have an adverse effect on coal-based electricity generation across the country. Finalizing emissions standards for new electric generating units was the first rule released. This rule creates a reliance on cost-prohibitive technology that will effectively prevent any new coal plants from being built across the country. Carbon capture and sequestration (CCS), the only technology described in the rule, is proving to not be ready for wide-scale technical implementation. Costs are escalating to the point that, even with heavy subsidization, projects are being abandoned.

The second and third rules work together. The second rule is the final version of the CPP. The third rule is a proposed "back stop" federal plan for states unable to, or choosing not to comply with the final CPP. These rules will result in an unprecedented overhaul of the power generation, transmission and distribution system by dramatically reducing fossil-fuel based power generation and establishing aggressive renewable energy goals. These rules together are an effort to circumvent Congressional authority by creating a large-scale program to revamp the power industry based on a rarely used provision of the Clean Air Act (CAA) and move to an environmental model to replace the long-standing economic model for the generation of electricity.

U.S. EPA made certain changes in response to comments on the proposed CPP. Changes include pushing the initial compliance date to 2022 from 2020, creating a reliability safety valve to account for short-term grid problems, and making energy efficiency optional rather than a core requirement of the rule. However, it is also evident that U.S. EPA raised the rule's carbon emissions reduction goal from 30 percent to 32 percent nationwide and changed many state mandated reduction targets. In Ohio, our mandated target is now roughly 11% more aggressive than the proposed rule. This now means Ohio will need to lower its carbon emissions rate by 37% between 2012 and final implementation of the CPP. In fact, 15 other states will need to achieve even greater reductions.

The final CPP also dictates that natural gas generating units be deployed at a 75 percent capacity factor. Updated cost projections using the final rule have not been completed. However, the Public Utilities Commission of Ohio (PUCO) conducted a detailed analysis of the proposed rule estimating a 70 percent capacity factor and, as a result, predicted wholesale energy prices to be 39 percent higher in calendar year 2025, costing Ohioans \$2.5 billion. Modeling to project the impact on the bulk power markets, wholesale energy costs and reliability of the power supply is ongoing both within Ohio as well as across the Interconnection Regions.

As is evident at this early stage of review of the final CPP, U.S. EPA has made profound changes to the proposed rule. The number, nature, and overall level of wholesale changes drive Ohio to call for U.S. EPA to re-release the final CPP as a proposed action allowing interested parties an opportunity to review and provide comment. This is not uncommon in Ohio and fairly provides interested parties time to provide comments on significantly revised rules.

Additionally, there is a legal case pending in the Federal Court System that argues U.S. EPA does not have the authority under the Clean Air Act (CAA) section 111(d) to promulgate the CPP because the plain language of the statute does not allow a source category (such as coal-fired power plants) to be regulated under that section if they are already regulated under section 112 (the hazardous air pollutant section). In addition, the CPP is so restrictive that states or U.S. EPA will be forced to regulate activities outside the fence line of the regulated entities. This "fence line" or property line around a regulated facility represents the traditional confines of U.S. EPA's authority. The state of Ohio has joined the legal proceeding arguing that Congress could not have meant to grant U.S. EPA blanket authority under section 111(d) to directly or indirectly revamp the entire national bulk power system.

On numerous occasions, at both U.S. EPA and the D.C. Circuit Court of Appeals, the State of Ohio has pointed out the serious legal shortcomings of the rule and asked for implementation of the rule to be stayed until the fundamental legality I described above can be resolved. This request needs to resolve the issues of authority before the irreversible impacts of implementing the final CPP are set in motion. One needs to look no further than the Mercury Air Toxics rule impacts in Ohio to see that even when U.S. EPA is remanded by the U.S. Supreme Court, the damage has been done and is irreversible.

This is why Governor Kasich has written a letter to the President asking to stay implementation of the rule until all legal appeals are resolved. As the letter states, this is very reasonable "especially in light of the recent U.S. Supreme Court decision remanding the U.S. Environmental Protection Agency's Mercury and Air Toxic Standards to the D.C. Circuit court for further consideration." I have included a copy of the Governor's letter with my testimony today for you to read at your convenience. So far, none of these requests have been honored, and we are marching down the road toward implementing a rule with far-reaching economic consequences without any assurance that the rule is even a legal exercise of U.S. EPA's authority.

Responding to the CPP has already been a substantial effort for Ohio EPA. In U.S. EPA's Response in Opposition to 'the States' request for a stay (via an extraordinary writ), filed August 31, 2015, it stated that *"there is absolutely nothing that Petitioners are required to do in this brief period before Rule Publication."* This statement is disingenuous at best. Unless a state asks for a two-year extension the deadline for states to submit a compliance plan to U.S. EPA is less than a year away. If U.S. EPA believes that the states don't have to do anything until publication of the rule, which now may be late October 2015, they are failing to recognize and appreciate the investments states have already made.

Ohio has already spoken and met with many stakeholders, substantially increased staff devoted to analyzing the rule, coordinated extensively with the PUCO, created state-specific fact sheets, begun our reassessment of the new technical data, attended webinars, drafted mandatory stakeholder outreach efforts statewide, and started review of the 1560 page final rule for existing sources, 755 page proposed federal plan rule, 768 page rule for new sources, and hundreds of pages of new technical guidance. In my opinion, this is a heavy lift but it's just a start to the resources, stakeholder engagement and legislative and rule changes that will be needed. And with

already tight and declining budgets permitting, compliance, state planning and other aspects of Ohio EPA's air program have been, and will continue to be, directly sacrificed.

I strongly believe the CPP is not the answer. With unresolved legal challenges, along with substantial changes between the draft and final proposal, U.S. EPA should hold off on implementing the final CPP until legal challenges are resolved or reissue the final CPP as a proposed action.

Thank you for the opportunity to testify this morning. I am happy to answer any questions you may have, and stand ready to work with this Subcommittee in addressing the issues outlined in my testimony.

Craig W. Butler
Director
Ohio Environmental Protection Agency

On February 21, 2014, the Governor appointed Mr. Butler as Director of Ohio Environmental Protection Agency. Butler has served as interim director of the Agency since early January. He previously served as the Assistant Policy Director for Energy, Agriculture and the Environment in Governor Kasich's administration.

A public servant of more than 24 years, he previously served as District Chief of both Ohio EPA's Central District Office and its Southeast District Office. He is a past member of the Board of Directors for the Ohio Alliance for the Environment.

Mr. Butler graduated Mansfield University in Mansfield Pennsylvania with honors with a BA in Geography and Environmental Science. After receiving a scholarship from Ohio University he also graduated from Ohio University with a Masters in Environmental Science.

Chairman BRIDENSTINE. Thank you, Director Butler.
Mr. Eisdorfer, you are recognized for five minutes.

**TESTIMONY OF MR. JASON EISDORFER,
UTILITY PROGRAM DIRECTOR,
OREGON PUBLIC UTILITY COMMISSION**

Mr. EISDORFER. Chair Bridenstine, Chair Smith, Members of the Committee, I am Jason Eisdorfer, Director of the Utility Program at the Oregon Public Utility Commission.

For more than a year now, three Oregon state agencies, the Department of Environmental Quality, the Department of Energy, and the Public Utility Commission, along with nearly two dozen major stakeholders have been working together to understand EPA's draft and now final 111(d) rule, and we are now working on implementing the Clean Power Plan.

In our initial comments to the rule back in October of last year, the Director of Oregon's DEQ wrote on behalf of the state that "The Clean Power Plan proposal is a welcome federal response to reversing climate change and is a good first step in mitigating the effects of greenhouse gas pollution across the country." Governor Kate Brown has stated that "The EPA's Clean Power Plan is in the best interests of Oregon on many fronts. A healthy environment is essential to ensuring the health of Oregonians and protects our quality of life for many generations to come.

As we look at how Oregon fares under the final rule, we can say that Oregon is in pretty good shape, and there is a reason for this. Oregon has been planning for this eventually for more than two decades. The risk of greenhouse gas regulation that we have required the utilities to plan for is now a reality. Oregon's utility ratepayers have been investing in clean energy to reduce the costs and risks of carbon regulation and those investments are paying off. Here are a few investment highlights.

The investor-owned utilities in Oregon engage in integrated resource planning, which is firmly rooted in robust analysis that compels the utility to make decisions that result in a least-cost, least-risk future for its customers. This has included considering that risk of future costs of greenhouse gas regulation and the utilities' decisions about what types of energy resources to invest in.

Oregon's largest utility, Portland General Electric, is retiring the State's only coal plant in 2020, about 20 years ahead of schedule, based on a least-cost, least-risk determination by the Public Utility Commission. Customers of the two largest utilities have been paying into a dedicated fund for cost-effective energy efficiency and we believe our energy efficiency delivery system is second to none. Oregon has a renewable portfolio standard that directs the state's largest utilities to serve their customers with 25 percent renewable energy by the year 2025.

This is but a partial list of policies and investments that have put Oregon, its utilities and their customers in a strong position to comply with the Clean Power Plan. These investments will reduce the costs and risk of compliance with the plan and keep our utility system strong and robust.

Despite these long-term investments, or perhaps because of these long-term investments, our economy is strong. Since 2000, per cap-

ital carbon emissions have been in steady decline in Oregon and yet the state's GDP is as good as or better than the national average. Oregon's real GDP growth exceeded the U.S. rate in 13 of the 16 years between 1998 and 2013, and Oregon ranks among the 15 fastest-growing state economies in 11 of those 16 years.

The Clean Power Plan provides state regulators with a significant degree of flexibility in determining how to comply and has accommodated states that are differently situated. In Oregon, we are currently exploring that degree of flexibility to decide whether to use a rate-based system or a mass-based system, for example. To their credit, EPA has revised the plan to address the concerns of Oregon, other states, and stakeholders. And EPA has improved its thinking about the reliability effects of the Clean Power Plan in the final rule and understands that reliability is of paramount importance to utilities, regulators and the customers.

The plan is accommodating of a variety of state compliance approaches, allowing Oregon to leverage existing state laws and recognizing under particular approaches the historic investment Oregon ratepayers have made in clean energy.

However, Oregon is not an island and it's not enough for Oregon to comply with the Clean Power Plan within its own borders. Ratepayers of several of our utilities are tied to fossil fuel generation located in other states. We are more than interested in how other western states comply with the Clean Power Plan since our electricity rates depend on how those states comply.

As Oregon looks to implement its own compliance plan, we are very interested in exploring the potential for collaboration with neighboring states using market mechanisms to reduce the overall cost of compliance and enhance the overall effectiveness of reducing greenhouse gas emissions. Oregon is proud of our clean energy investment strategy, and we are in a good position to comply with the Clean Power Plan. If the various states collaborate and cooperate, the Clean Power Plan offers the United States a path toward finally addressing the real and pressing issue of climate change on an integrated and least-cost basis.

I appreciate the opportunity to testify before the Committee today. Thank you.

[The prepared statement of Mr. Eisdorfer follows:]

Testimony of Jason Eisdorfer

In front of the Committee on Science, Space, and Technology
Subcommittee on Environment
Friday, September 11, 2015

Good morning, I am Jason Eisdorfer, Utility Program Director of the Oregon Public Utility Commission. I appreciate the opportunity to testify to the committee this morning.

For more than a year now, three Oregon State agencies, the Department of Environmental Quality (DEQ), Department of Energy (ODOE), and the Public Utility Commission (PUC) along with nearly two dozen major stakeholders, have been working together to understand EPA's draft and now final Clean Air Act Section 111(d) rule, and we are now working on implementing the Clean Power Plan. In our initial comments to the rule back in October of last year, the Director of Oregon's DEQ wrote on behalf of the state that the Clean Power Plan proposal is "a welcome federal response to reversing climate change and is a good first step in mitigating the effects of greenhouse gas pollution across the country."¹ Governor Kate Brown has stated that the EPA's Clean Power Plan rule "is in the best interests of Oregon on many fronts. A healthy environment is essential to ensuring the health of Oregonians and protects our quality of life for many generations to come."²

Climate change models in the northwest region forecast several significant impacts, including: (1) decreased snow pack and resulting changed river flow, temperature, and hydrology that effects hydropower generation and fish habitat; (2) rising coastal sea level rise; and (3) increased occurrence and size of wildfires.³ Ongoing research on the regional implications of climate change largely confirms observations, projections, and analyses made over the last decade and provide information about ongoing climate change impacts.⁴ Oregon and the surrounding region are experiencing the impacts of climate change now. June 2015 was the hottest June on record in the northwest, with two historic heat waves each lasting over ten days.⁵ Forest fires are also breaking records in the region. This year, the Okanogan Complex Fire is now the largest in the Pacific Northwest region's history, burning over 304,782 acres as of August 30, 2015. In July 2015, more than a quarter million sockeye salmon returning from the ocean to spawn were found dead or dying in the Columbia River and its tributaries because of warming water temperatures.⁶

¹ Dick Pederson, Letter to EPA Administrator Gina McCarthy, October 16, 2014 (*available at* <http://www.deq.state.or.us/aq/climate/docs/epaLcomment.pdf>).

² Governor Kate Brown, Press Release, August 3, 2015 (*available at* <http://www.oregon.gov/newsroom/Pages/NewsDetail.aspx?newsid=765>).

³ *See, generally*, Oregon Climate Change Research Institute, Northwest Climate Assessment Report, 2013 (*available at* <http://occri.net/wp-content/uploads/2013/11/ClimateChangeInTheNorthwest.pdf>).

⁴ Oregon Climate Change Research Institute, Northwest Climate Assessment Report – Two Page Summary, 2013 (*available at* http://occri.net/wp-content/uploads/2013/11/ClimateChangeNW_2pgSummary.pdf).

⁵ The Oregonian, Temperature, rainfall records tumble in Portland: June weather by the numbers, July 1, 2015 (*available at* http://www.oregonlive.com/weather/index.ssf/2015/07/june_weather_by_the_numbers_te.html).

⁶ The Oregonian, Hot water kills half of Columbia River sockeye salmon, July 27, 2015 (*available at* http://www.oregonlive.com/environment/index.ssf/2015/07/hot_water_killing_half_of_colu.html).

Federal and state fisheries biologists say the warm water is lethal for the cold-water species and is wiping out at least half of this year's return of 500,000 fish.⁷

EPA's Clean Power Plan rule is intended to begin addressing climate change and its impacts. As we look at how Oregon fares in complying with the final rule, we can say that Oregon is in pretty good shape and there is a reason for this, Oregon has been planning for this eventuality for more than two decades. The risk of greenhouse gas regulation that we have required the utilities to plan for is now a reality. Oregon's utility ratepayers have been investing in clean energy to reduce the costs and risks of carbon regulation, and those investments are paying off. Here are a few investment highlights:

A History of Integrated Resource Planning: The investor-owned utilities in Oregon engage in integrated resource planning, which is firmly rooted in robust analysis compelling the utility to make decisions that result in a least cost and least risk future for its customers. This has included considering the risk of future costs of greenhouse gas regulation in the utility's decisions about what types of energy resources to invest in.

- In 1989, the PUC adopted "least-cost and least-risk planning" tools and directed the regulated utilities to develop integrated resource plans that identify supply-side and demand-side resources that provide the most reasonable mix of cost and risk. All resources, including energy efficiency and renewable energy resources, must be evaluated on a consistent and comparable basis.
- In 1993, the PUC required that the utilities include analysis of risk of future costs of potential greenhouse gas regulation in integrated resource plans.
- In 2012, the PUC required the utilities to consider and plan for needed flexible capacity in their integrated resource plans so that they could integrate more renewable energy onto the electric system.

Retiring Boardman Coal Plant: Oregon's largest utility, Portland General Electric, is retiring the state's only coal plant in 2020, more than 20 years ahead of schedule, based on a least cost and least risk determination by the Public Utility Commission.

- After the DEQ adopted its first regional haze BART rule in 2009, Portland General Electric incorporated the rule's emissions control requirements and stakeholder suggested alternatives into the company's integrated resource plan. After ensuring that the company would have sufficient time to secure reliable replacement power, the PUC acknowledged the revised integrated resource plan in 2010. Boardman was scheduled to close 2040, but is now scheduled to close in 2020 – a full 20 years before its original retirement schedule.
- In its integrated resource plan analysis, the utility compared the cost of closing the plant in 2020, with interim environmental controls, to keeping the plant open until 2040 with the full range of environmental controls along with an added risk of future greenhouse gas regulation. The utility determined that closing the plant by 2020 with interim environmental controls would only result in about a 2 percent rate increase, rather than

⁷ *Id.*

about a 3.5 percent rate increase for the full investment in pollution controls to keep the plant open until 2040.

- Because of the early closing of Boardman, between 3 and 4.5 million metric tons of CO₂-equivalent will be avoided per year for 20 years starting in 2020.

Energy Efficiency Investments: Customers of the two largest utilities have been paying into a dedicated fund for cost-effective energy efficiency and we believe our energy efficiency delivery mechanism is second to none.

- In 1999, Oregon created an independent nonprofit organization to deliver cost effective energy efficiency and market transformation funded through a public purpose charge collected from ratepayers of electric investor owned utilities. This nonprofit organization was later named Energy Trust of Oregon (Energy Trust) and began acquiring energy efficiency savings in 2002.
- Today, identification of all cost effective energy efficiency continues through cooperative planning between the utilities and the Energy Trust. The utility's bi-annual integrated resource planning and has led to energy efficiency being a significant portion of the lowest cost and least risk utility integrated resource plans. For example, Portland General Electric's 2013 Integrated Resource Plan called for no new major supply resources within the next 10 years but does select increased energy efficiency to meet short and long term energy needs.⁸
- Oregon state policies and utility regulation of energy efficiency have paid off for ratepayers, program participants, and for Oregon overall.
 - From 2002-2014 Energy Trust has acquired 4,310 GWh (492aMW) of electric savings at a levelized cost of 2.34 c/kWh,⁹ which is 29 percent of what it would have otherwise cost the utilities to supply an equivalent amount of delivered electricity. This represents energy savings equivalent to building a 500 MW power plant or enough energy to power more than 470,700 Oregon homes.¹⁰
 - Energy Trust savings are spread broadly across all energy users: residential, commercial, industrial, and agriculture. The more than half a million customers who realized these savings by participating in Energy Trust programs have already saved \$1.9 billion on their utility bills, and over time, these savings will grow to reach \$4.8 billion.¹¹ Those savings were delivered through projects installed by contractors throughout the state and the bill savings from participants flowed back into the economy.
 - By 2010, annual savings from Energy Trust programs were equal to 1.5 percent of load, the target acquisition level the EPA set in the draft plan representing best practices of energy efficiency acquisition in the nation. The graph below shows

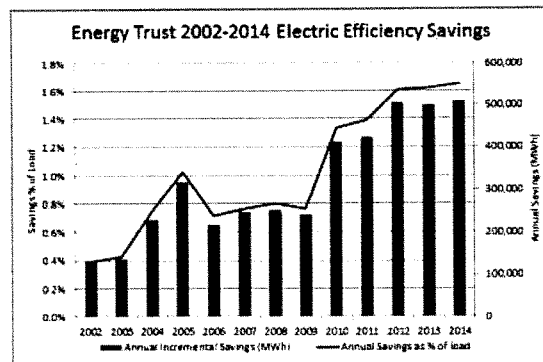
⁸ Portland General Electric, Integrated Resource Plan, 2013 (*available at* https://www.portlandgeneral.com/our_company/energy_strategy/resource_planning/docs/2013_irp.pdf).

⁹ Energy Trust of Oregon, Annual Report to the Oregon Public Utility Commission, 2014 (*available at* http://assets.energytrust.org/api/assets/reports/2014_ETO_Annual_Report.pdf).

¹⁰ This number represents nearly twice the number of households in the Portland, OR metro area.

¹¹ Energy Trust of Oregon, Annual Report to the Oregon Public Utility Commission, 2014 (*available at* http://assets.energytrust.org/api/assets/reports/2014_ETO_Annual_Report.pdf).

that since 2002, energy efficiency investments in Oregon have resulted in up to 500,000 MWh of new electricity savings per year, which is equivalent to powering one quarter of all the homes in Washington DC for one year.¹²



Renewable Portfolio Standard: Oregon has a renewable portfolio standard that directs the state's largest utilities to serve their customers with 25 percent renewable energy by 2025.

- Oregon is home to a full range of renewable energy resources, including wind, solar, geothermal, biomass, ocean energy, and hydroelectric power, and has a strong suite of policies to encourage the development and use of renewable energy in the state and the broader region.
- In 2007, Oregon enacted a renewable portfolio standard (RPS) that requires all utilities to support renewable energy and requires the largest utilities in Oregon to provide 25 percent of their retail sales of electricity from renewable sources of energy by 2025. This policy is the state's strongest device for furthering the development of renewable resources. Along with fellow Western states, Oregon has established a tracking system, the Western Renewable Energy Generation Information System (WREGIS), to ensure that the attributes and megawatt hours (MWhs) of renewable energy are accounted for properly and double attribution of renewable energy does not occur.

This is but a partial list of policies and investments that have put Oregon, its utilities, and their customers in a strong position to comply with the Clean Power Plan. These investments will reduce the cost and risk of compliance with the Clean Power Plan and keep our utility systems strong and robust. Despite these long-term investments, or in fact because of these long-term

¹² Produced by Energy Trust and PUC staff with data from Energy Trust of Oregon (*available at* http://assets.energytrust.org/api/assets/reports/PAR_2014.pdf), Oregon Utility Statistics (*available at* http://www.puc.state.or.us/Pages/Oregon_Utility_Statistics_Book.aspx), and the Energy Information Administration (*available at* <http://www.eia.gov/electricity/data/eia826/>).

investments, our economy is strong. As seen below, statewide per capita emissions have been decreasing since 2000.¹³

	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
Statewide per capita emissions (MT) ^{1,3}	20.0	20.5	20.6	19.0	18.5	18.9	18.0	17.1	16.5	16.3	15.7

While per capita emissions have been in steady decline, Oregon's GDP is as good as or better than the national average. Oregon's real GDP growth exceeded the U.S. rate in 13 of the 16 years from 1998-2013. Oregon ranks among the 15th fastest growing state economies in 11 of the 16 years between 1998 and 2013, and it was in the top five between 2010 and 2012. The graph below shows Oregon's top five ranking.¹⁴



Reliability of the electricity system is of paramount importance to utilities, regulators, and customers. The EPA has improved its thinking about reliability effects of the rule by changing the compliance period and adding mechanisms for states to seek revision of compliance plans in case of reliability concerns, along with adding a reliability safety valve.

¹³ Produced by ODOE staff with data from Oregon GHG Inventory (*available at* <http://www.deq.state.or.us/lq/consumptionbasedghg.htm>); U.S. Department of Commerce (*available at* http://bea.gov/iTable/index_regional.cfm); and Portland State University Population Research Center (*available at* <http://www.pdx.edu/prc/annual-oregon-population-report>).

¹⁴ Oregon Office of Economic Analysis, State GDP 2013, June 11, 2014 (*available at* <http://oregoneconomicanalysis.com/2014/06/11/state-gdp-2013/>).

- EPA provides more time to plan for compliance by starting the compliance period in 2022 rather than 2020.
- EPA provides a mechanism for a state to seek revision to its plan or re-submit a new plan in case of unanticipated reliability challenges.
- EPA's Clean Power Plan rule includes a safety valve that involves an initial period of up to 90 days during which a reliability-critical electric generating units (EGUs) will not be required to meet the emission standard established for it under the state plan but rather will meet an alternative standard.

In addition there are existing tools and frameworks across the country to protect the reliability of the grid. At the state and regional levels there is a significant focus on reliability and there are many layers of reliability oversight ranging from the utilities themselves to the Western Electricity Coordinating Council (WECC) and the North American Electric Reliability Corporation (NERC).

- Under WECC and NERC rules, each balancing authority in the west must maintain a minimum amount of contingency reserve power.
- Oregon utilities carry a 13 percent reserve margin to ensure that they can meet demand in a major event such as the unexpected loss of a generator.

To their credit, EPA has revised the Clean Power Plan to address the concerns of Oregon, other states, and stakeholders. There are real improvements in allowing interstate coordination between states and removing barriers that were in the draft rule. The Clean Power Plan provides state regulators with a significant degree of flexibility in determining how to comply and has accommodated states that are differently situated. In Oregon, we are currently exploring that degree of flexibility to decide whether to use a rate-based system or a mass-based system, whether to apply for early action credits, and whether to go it alone or participate in multi-state allowance markets. The Clean Power Plan is accommodating of a variety of state compliance approaches, allowing Oregon to leverage existing state laws and recognizing, under particular approaches, the historic investment Oregon ratepayers have made in renewable energy and energy efficiency.

However, Oregon is not an island. It is not enough for Oregon to comply with the Clean Power Plan within its own borders. Ratepayers of several of our utilities are tied to fossil fueled generation located in other states. We are more than interested in how other Western states comply with the Clean Power Plan, since our electricity rates depend on how those states comply. As Oregon looks to implement its own compliance plan, we are very interested in exploring the potential for collaboration with neighboring states and potentially using market mechanisms to reduce the overall costs of compliance and enhance the overall effectiveness of the program in reducing greenhouse gas emissions. It stands to reason that a state that has not followed Oregon's early-investment strategy would likely have some low-hanging fruit, which could mean that the state should have inexpensive clean energy alternatives over the next decade, at least in cost-effective energy efficiency. In addition, the Clean Power Plan offers a variety of market-based tools to reduce the cost of compliance.

Oregon is proud of our clean energy investment strategy and we are in a good position to comply with the Clean Power Plan. If states collaborate and cooperate, the Clean Power Plan offers the United States a path toward finally addressing the real and pressing issue of climate change on an integrated and least cost basis.

Jason Eisdorfer
Short Biography

Jason Eisdorfer has served as the Utility Program Director of the Oregon Public Utility Commission since 2012. He oversees a staff of approximately 77 employees and provides direction to formulate policies, recommendations, and practices regarding the regulation of investor-owned electricity, natural gas, water and telecommunications utilities. He ensures that program staff considers the balances between consumer interests, shareholder interests, and state policy. He advises the Commissioners on policies and issues concerning utility regulation and evolving industry structures. He oversees the administrative affairs of the Utility Program and its biennial budget in excess of \$8 million.

Previously Eisdorfer was the Interim Director of Strategy Integration at the Bonneville Power Administration, a federal Power Marketing Administration, and before that he served as BPA's Greenhouse Gas Policy Advisor. In this role he served as the senior advisor to the agency on policies and programs related to climate change.

Eisdorfer served as legal counsel and energy program director of the Citizens' Utility Board of Oregon for 13 years. He acted as legal representative for all organizational activities on behalf of residential utility customers of investor-owned electricity, natural gas and telecommunications utilities in Oregon before state and federal agencies and state courts.

He has co-authored state legislation related to climate change and to electric utility restructuring and operations, including the electricity restructuring law in 1999, and the Oregon Renewable Energy Act and the Climate Change Integration Act, both of 2007, and more recently he has advised on additional state legislation concerning storage technology pilots and natural gas utility carbon reduction programs. He has served on numerous boards and is the Governor's appointee to the Northwest Energy Efficiency Alliance Board of Directors.

Eisdorfer enjoyed his service as an adjunct professor of law between 2008 and 2012 at both the University of Oregon School of Law and the Northwestern School of Law at Lewis and Clark College, teaching classes on energy law and climate change law and policy. He is a graduate of the University of Chicago and he received his law degree from the University of Oregon.

Chairman BRIDENSTINE. Thank you for your testimony.

Members are reminded that Committee rules limit questioning to five minutes, so we'll go into a round of questioning here, and I'll recognize myself for five minutes.

There's a chart that was given to us by the U.S. Chamber of Commerce. It's a map of the United States, and you can see that the green states—I'm having a hard time reading that little but I've got it here. So it says the green states this is winners and losers from the EPA carbon regulations, and it says states that will be able to increase CO₂ are in green, or they'll be able to sell credits to others needing to achieve compliance. States that are in red must reduce CO₂ emissions or purchase credits from states in order to comply.

So this to me, this rule has been published—no, it actually hasn't been published. It's been finalized but it's not been published in the Federal Register as of this point. But when it goes into effect, it's going to establish winners and losers. I guess my question for the witnesses, and I'd like to start with you, Chairman Shaw, is, do you perceive this as a transfer of wealth from maybe your State of Texas to the green states?

Dr. SHAW. Thank you, Chairman. Certainly, when you look at the fact that Texas rate will have to be reduced by about 33 percent, that is coming to come at a cost, and certainly one of the major costs that we've seen and part of the reason that we've been able to have economic prosperity and growth in our state has been due to low cost of energy. The likely pretty extreme increase in rates is going to make it much more difficult for our state to continue to provide those jobs and resources that are necessary for that growth. So yes, it would certainly make it easier or make an uneven playing field from that perspective if you're not having to make those investments, and we've made investments. You know, \$7 billion in building out transmission lines for our 13,000 megawatts of wind energy are significant investments that we've already made.

Chairman BRIDENSTINE. Director Butler, how do you see this for your state?

Mr. BUTLER. Thank you for the question. I look at it two ways. There's two ways for a state to comply, particularly Ohio. We're either going to need to shut down additional coal assets and buy more expensive power, or buy credits from somebody else. Both of those will have a significant cost for the State of Ohio to reach what I indicated in my testimony, which is a 37 percent reduction in CO₂ emissions, and that's an 11 percent increase over the draft plan.

Chairman BRIDENSTINE. Mr. Eisdorfer, it looks like your state is going to be able to sell power or sell credits. You guys stand to gain a lot from a rule that by the way that did not exist until this month.

Mr. EISDORFER. Mr. Chair—

Chairman BRIDENSTINE. Or I guess last month.

Mr. EISDORFER. Mr. Chair, two quick points. One, under the proposed rule, Oregon actually did not come out very well in this sense, and yet the state really welcomed the Clean Power Plan as

a good first step toward addressing climate change. So the final rule did turn the tables a little bit.

But the second point I would make is that there are a number of customers of utilities in Oregon that are tied to assets in Montana, Wyoming and Utah. So in that sense, Oregon is tied throughout the West, and while that makes it look like Oregon is sitting pretty, we have a lot of work to do and a lot of cooperative discussions on a multistate basis in the West.

Chairman BRIDENSTINE. Do you disagree that Oregon will be advantaged compared to Texas or Ohio?

Mr. EISDORFER. Again, there are two things that Oregon has to think about. One is complying as a state, and in that sense, Oregon is in very good shape. The second thing is, rate impacts on customers in Oregon and we have to work with the states in which thermal resources are outside of Oregon but serving Oregon. So it's a little bit of half a loaf, perhaps.

Chairman BRIDENSTINE. Dr. Shaw, the EPA has assumed in the final Clean Power Plan that renewable energy sources will increase dramatically as a result of this rule. My home State of Oklahoma is already a nationwide leader in wind energy. We're fourth in the country in electricity produced from wind, accounting for over 15 percent of electricity generation in Oklahoma. Do you believe the EPA's targets for renewable energy increases the—increases are—renewable energy increases are realistic given the existing increases in production in states such as yours and mine, Oklahoma and Texas?

Dr. SHAW. Chairman, we've—my state as well as yours have made pretty phenomenal increases in renewables, especially wind energy, and the rate that EPA has projected in determining our goal it appears that for years 23 through 30, we would have to increase our renewables and wind being part of that at the maximum rate that we've ever done it every year in that time frame, and I think that's far from typical and would be very challenging to meet.

Chairman BRIDENSTINE. Last question. I'm running out of time.

Under the final Clean Power Plan, will states like Oklahoma and Texas get any credit for renewable energy sources that have already been implemented in their states? The investments we've already made, will we get credit for that?

Dr. SHAW. Unfortunately, because most of the—many of those investments happened after the—excuse me—before the 2012, which they use as a baseline, we don't get credit for those investments, and so it is a pretty significant blow from that perspective.

Chairman BRIDENSTINE. Thank you for your testimony, and I'd like to recognize Ranking Member Bonamici for five minutes for her questions.

Ms. BONAMICI. Thank you very much, Mr. Chairman.

Mr. Eisdorfer, I only have five minutes and I have a lot of questions, so I'm going to ask three—one about flexibility, one about the grid and one about costs—and I'll ask them all at once to save time.

So you give EPA credit for revising the Clean Power Plan to address some concerns of states and stakeholders. You said that the Clean Power Plan provides state regulators with a significant degree of flexibility in determining how to comply. So I want you to

talk a little bit about how that flexibility will work and how that's responsive to concerns that have been raised.

Secondly, with regard to the grid, you state in your testimony that there are existing tools and frameworks across the country to protect the reliability of the grid, and that's a concern that we've heard raised, so can you please discuss how the rule was changed to address reliability concerns and whether those changes are sufficient to alleviate the grid reliability?

And finally, one of the main criticisms, and we heard this morning, is that the Clean Power Plan will cause electric bills to increase, but according to the EPA, the average electricity bills will be cut, and by 2030, the average American family will save \$7 on their electric bill per month. So how have consumers and communities in Oregon benefited from programs like the Energy Trust, for example, the state's energy efficiency program, and specifically, what has been the effect on electricity bills? So reliability, grid and cost. Thank you.

Mr. EISDORFER. Thank you, Representative Bonamici. We could talk for hours on this but I'll try to be brief.

The flexibility comes in a number of ways and I'll sort of list a couple. States are allowed to choose whether to go with a mass-based or a rate-based calculation that allows states to really tailor their particular situation. Under the proposed rule, Oregon was in a position where we really couldn't choose between the two, and under the final rule, mass-based became an option. So now as we talk to stakeholders, mass-based versus rate-based is very much on the table. The EPA also makes it very clear that the states are going to have wide discretion on how to allocate allowances. States can choose to go it alone or join in multistate bilateral or multilateral agreements or even go into a trading ready kind of platform. And so there really are a number of different choices that the state can make.

In terms of reliability, there were some significant improvements in the plan. The EPA provided a mechanism for states to seek a revision of their plan if there are unanticipated reliability challenges. There's also a safety valve that would allow emissions from a plant to not count under the goal under certain reliability circumstances, and something that we're actually also looking closely at is the memorandum of understanding between the EPA, FERC and the U.S. Department of Energy where there's going to be a coordinated process to help the states address reliability concerns, monitor how that state plan development is going to go, and then provide support for this important transition period.

And then finally, on the electricity bills. What I think Oregon has done extremely well in the last 20 years is planning. Our integrated resource planning process really causes the utilities to think very long and hard about the least-cost, least-risk approach. Oregon, especially since 1999 but even dating back to 1980, has treated energy efficiency not as a boutique thing to do every now and then but as a genuine resource that a utility should rely on. It is a cost-effective resource and should be at the top of the list of any utility acquisition as being the lowest-cost resources. So between planning, energy efficiency, we've been able to maintain our low cost. We are below average and we've been below average for quite

some time. We don't expect the Clean Power Plan to fundamentally change that because the tools that you would use to meet the clean power obligations are the very tools that we've been using to keep rates low.

Ms. BONAMICI. Thank you very much.

Chairman BRIDENSTINE. Thank you, Ms. Bonamici.

I now recognize the Vice Chairman, Mr. Westerman.

Mr. WESTERMAN. Thank you, Mr. Chairman.

I have two coal-fired plants in my states that could be closed. One is actually in my district in southwestern, and has already been announced to be closed, and there are studies that show that our rates will increase from 20 to 60 percent because of this closure. The obvious negative effects are direct loss of several hundred highways jobs and an economic loss of \$500 to \$600 million per year. The higher rates will put a disproportional burden on low- and fixed-income residents in my district, not only in their higher light bills but also in the increased cost of goods.

Chairman Shaw, welcome to the Committee. It's nice to have a fellow bio and agricultural engineer. There's not too many of us out there.

Dr. SHAW. Right.

Mr. WESTERMAN. If you look at Texas, what's the split on residential versus industrial commercial use?

Dr. SHAW. I don't have that information, Congressman. I don't know what—you're talking about how much of that—I mean, it's largely driven by the commercial. We are a large energy consumer because of the fact that we manufacture good and process materials that supply much of the rest of the United States. So we're heavy on the commercial side.

Mr. WESTERMAN. Right. And in Ohio, is that similar there too?

Mr. BUTLER. Yes, sir. Ohio's the sixth largest energy-consuming state in the United States. Fifty percent of that is for industrial.

Mr. WESTERMAN. And Mr. Eisdorfer, in Oregon?

Mr. EISDORFER. My recollection is that residential is about 40 percent and the remainder is split between commercial and industrial.

Mr. WESTERMAN. Okay. I think we fail to see sometimes how much of the power actually goes into industry and jobs. So if you look at current air quality standards in Texas and the rest of the United States and compare those to the world, just kind of quickly on a scale one to ten, one being low quality and ten being high quality, where would you say China would be on that scale, Chairman Shaw?

Dr. SHAW. On the south end of that, some of the worst air quality that exists exists in some parts of China.

Mr. WESTERMAN. And Indonesia, Vietnam. What about Western Europe? Where would you—

Dr. SHAW. They're certainly better than you see in China but they're still not at the levels that we are.

Mr. WESTERMAN. And in the United States?

Dr. SHAW. I would say if we're not a ten, then the scale needs to be accommodating to put us there.

Mr. WESTERMAN. But we're leading in the world in air quality standards?

Dr. SHAW. Yes, sir.

Mr. WESTERMAN. Okay. So do you believe higher costs and less reliable energy could drive industrial manufacturing jobs to countries with lower standards?

Dr. SHAW. I think it could. I think even the threat of higher costs can drive those overseas to lower-cost areas with less restrictive regulations.

Mr. WESTERMAN. And I know in my district, what we need very much are jobs and to get people back to work, and I would hate for investors to come in and see this huge increase in electrical rates and decide to move their manufacturing somewhere else and potentially somewhere where it would actually do more damage to air quality than they would do in my state.

Let's shift gears a little bit. When we look at this Clean Power Plan, there seems to be still be a lot of confusion in it, and Mr. Eisdorfer, I've spent quite a bit of time out in your state, a very beautiful state, maybe except for the large wind farms along the Columbia Gorge that dot the landscape, but you do have a tremendous amount of biomass in Oregon. How do you feel about the EPA's treatment of biomass as renewable energy?

Mr. EISDORFER. Representative Westerman, that is something that we continue to look at. As you just said, there are some things that remain unclear. That's not something that we loved and yet at the same time we sort of recognized what the EPA was trying to—the message they were trying to send is that not all biomass is treated equal. So folks at DEQ and Department of Energy are—

Mr. WESTERMAN. Are they saying some biomass is not renewable?

Mr. EISDORFER. They're saying that the carbon sequestration benefits need to be tracked very closely and so that may mean that some biomass is treated a little bit different and depending upon if it's very sustainably—

Mr. WESTERMAN. It's bad enough when EPA's picking winners and losers in power but then you even get into the renewables and they start winners and losers there. I think we should take an all-encompassing approach and utilize all the technology that we have, and especially the lower cost more efficient technologies and develop these other technologies with more research and development in those areas.

But it looks like I'm about out of time, Mr. Chairman, so I'll yield back.

Chairman BRIDENSTINE. Thank you for your questions.

Ranking Member Johnson is recognized for five minutes.

Ms. JOHNSON OF TEXAS. Thank you very much.

Mr. Shaw, I'm a native Texan. I'm a nurse by education. Last year, Parkland Hospital had a billion dollars of uncompensated care. Children's Hospital had about a third of that. Many of the conditions are respiratory related, which are also related to environmental contamination. Have you factored in the cost that it would take the state to continue to afford this kind of healthcare cost with most of our people being poor, that are living in low-income areas that are damaged more frequently by these heavy environmental violations?

Dr. SHAW. Congresswoman, the Clean Power Plan is directed at reducing greenhouse gases, which do not impact the respiratory issues. The co-benefits that are claimed in the rule——

Ms. JOHNSON OF TEXAS. Wait a minute. Repeat what you just said.

Dr. SHAW. The co-benefits, in other words, the rule is based on reducing the greenhouse gas——

Ms. JOHNSON OF TEXAS. I know what the rule says, but you said it does not impact respiratory?

Dr. SHAW. That's correct. Greenhouse gas emissions do not have an adverse impact on respiratory health. High CO₂ levels do not cause respiratory issues. I know it's easy to make that conclusion because some of the rhetoric from EPA sort of suggests that the Clean Power Plan is going to, by reducing greenhouse gases, lead to improvement in respiratory conditions. That's not due to reductions of CO₂.

Ms. JOHNSON OF TEXAS. What is it due to?

Dr. SHAW. It's due to their co-benefits. They're suggesting that the process that they're mandating to reduce greenhouse gases will also accidentally, if you will, or at the same time likely cause reductions in other emissions that they do perceive to cause respiratory impacts. The challenge with that, though, is that they're actually assuming that it's going to provide health benefits even though your area is already in attainment for the PM_{2.5} standard yet they're assuming that reducing PM_{2.5} even lower leads to health benefits even though their standards say that Houston area is already meeting the standard and therefore we're not having adverse health effects associated with PM_{2.5}. That's my concern, is that it's misleading whenever they've told us that you're going to have these health benefits associated with this rule. Most of those are unsubstantiated. The areas where there could be a benefit to those areas that are in non-attainment for ozone or something along those lines, those are being addressed through other rules and we're making strides to comply with those regulations. So CO₂ does not lead to respiratory challenges.

Ms. JOHNSON OF TEXAS. So you're challenging the goal of EPA? Their goal is health and safety of the people that inhabit this planet.

Dr. SHAW. The purpose of this—yes, ma'am. The purpose of this rule is to reduce greenhouse gas emissions, and as part of that, the stated goal there is—primarily the benefits they claim are a slight increase—excuse me, decrease in sea-level rise, unmeasurable, as well as a hundredth of a degree Fahrenheit reduction in increase in global temperature. Those are unmeasurable and those are not quantifiable from a benefit standpoint. Therefore, they went to the accidental co-benefits associated with it, not what the purpose of the rule was, to claim benefits to the rule.

Ms. JOHNSON OF TEXAS. So you're saying that it has absolutely nothing to do with the health status, that the science that has indicated that is not pure science?

Dr. SHAW. I'm suggesting that the goal and the objective of the Clean Power Plan and what led to this rule is climate change, climate variability, and that the contaminant that they're specifically seeking in the greenhouse gases and, more particular, carbon diox-

ide, which is the focus of the rule does not have health impacts. Carbon dioxide at the levels that we breathe it is actually good for plants. We breathe in oxygen and exhale carbon dioxide. You have to get much higher levels of carbon dioxide than we're ever going to see in the ambient air to get health effects associated with CO₂ to the human health. So the goal of the plan is to address climate change and yet that impact—

Ms. JOHNSON OF TEXAS. So climate change has no impact on health?

Dr. SHAW. The model suggestions of what this rule would accomplish would be an unmeasurable decrease in sea level and one-hundredth of a degree Fahrenheit in temperature change. So even the best estimate of what the climate change impact and benefit of this rule is so small as to be unquantifiable.

Ms. JOHNSON OF TEXAS. So would we continue to see climate change with a lot of flooding, a lot of air contamination, this is not going to impact health?

Dr. SHAW. For one, the IPCC, the Intergovernmental Panel on Climate Change, has indicated that the adverse weather that we're seeing has not been correlated with climate change. So there's certainly a science argument to be made and some additional data to be there but it's not clear that any—that the global climate change is going to have those impacts, and it's certainly clear that this rule would not have a measurable impact on any of those—a measurable change in climate change.

Ms. JOHNSON OF TEXAS. Could you submit to me your research findings and the origin of them?

Dr. SHAW. Sure, I will be happy to provide you some of the background information on that.

Ms. JOHNSON OF TEXAS. Thank you very much.

Dr. SHAW. Thank you, Congresswoman.

Ms. JOHNSON OF TEXAS. Thank you.

Chairman BRIDENSTINE. And the Chair now recognizes the Chairman of the full Committee, Mr. Smith, for five minutes.

Chairman SMITH. Thank you, Mr. Chairman.

To respond real quickly to what the Ranking Member said and her concern about the unreimbursed costs of Parkland Hospital, from what I read, the reason for those unreimbursed costs are primarily due to the fact that up to two-third of the births at Parkland are the children of illegal immigrants in the country today. It is not due to healthcare issues caused by carbon emissions.

Dr. Shaw, let me address my first question to you. The Chairman a few minutes ago put a chart on the screen that was produced by the Chamber of Commerce that showed that 42 states are going to be harmed by this Clean Power Plan, and by harmed, I mean they're going to see a dramatic increase in electricity costs. These electricity costs—and there's the chart—are going to disproportionately hurt low-income individuals because it's going to raise the cost of everything, whether it be food, whether it be electricity, whether it be anything else, and so I very much regret the impact on low-income Americans that this plan is going to have.

But I wanted to ask you, do you see any benefits whatsoever as a result of this plan's mandating the reduction in carbon emissions?

Dr. SHAW. Chairman, no. As you look at the exchange I had with Congresswoman Johnson, the rule does not, especially from the standpoint of its impact on carbon dioxide, does not have a measurable impact on sea level and/or the global temperature, and to your point, Texas having a competitive energy on the market, that is, you only get to generate and sell electricity if you can do it cheaply, has naturally driven our electricity generation grid, especially in ERCOT, to be the cheapest possible. Any reaching in from the federal government to force us to then choose more expensive generation will naturally increase electricity rates, and unfortunately, those who are least able to afford it, the fixed income and low income, will be least likely to be able to take advantage of energy efficiency measures and therefore they're going to be saddled with higher electricity rates and therefore electricity bills. So I don't share the EPA's optimism that we're going to have lower utility bills, especially for the low and fixed income.

Chairman SMITH. Okay. Thank you, Chairman Shaw.

Mr. Eisdorfer, let me ask you a question, and that is, do you think that this Clean Power Plan is going to have any significant impact on climate change?

Mr. EISDORFER. Chair Smith, absolutely. We can talk about the incremental benefits of this particular plan—

Chairman SMITH. Do you disagree with the EPA's data that shows it would only at best impact the rise in ocean levels by one one-hundredth of an inch?

Mr. EISDORFER. I can't say whether I agree with that or disagree with that. I just haven't done that analysis. But I do think you have to start somewhere, and if we don't begin to address it, then certainly the—

Chairman SMITH. But this is going to cost, by the EPA's own admission, which is probably low, the American consumers about \$9 billion. When the Administrator of the EPA herself was before the full Committee a couple of months ago, I made the point that I just made to you about no significant impact on climate change, and she did not deny that. She said only that it could be justified because we need to show action, which I don't think is sufficient justification. She did not dispute the data that showed it would only impact the rise in sea levels by one one-hundredth of an inch, the thickness of three pieces of paper, and we're subject the American people to burdensome regulations. They're going to cost jobs. It is going to increase electricity prices and disproportionately hurt low-income Americans, all so we can show action, not because it's going to have any significant impact on climate change. That's what the Administrator herself said. So apparently you disagree with her or you're just not sure?

Mr. EISDORFER. Well, Chair Smith, I think that if there are going to be costs borne by the public and the ratepayer, it is because certain plants are going to be dispatched less or be shut down entirely, and those are going to be coal plants, and if those coal plants are generating less carbon emissions, that is going to have a measurable effect on the environment and is beginning to address climate change on a national and international basis.

Chairman SMITH. When you say measurable effect, do you have any evidence whatsoever that it's going to impact the sea-level rise by more than one one-hundredth of an inch?

Mr. EISDORFER. I don't have that information.

Chairman SMITH. Okay. Thank you.

Last question is, you mentioned a while ago that you were disappointed that the Clean Power Plan was only going to sort of a half a loaf impact on the State of Oregon. What were you disappointed about, or what's the half loaf that did not meet your expectations?

Mr. EISDORFER. Chair Smith, I think I was probably arguing against the visual that was produced that seems to indicate that Oregon is in really, really great shape. We are in good shape for complying as a state, but as ratepayers, since we are tied to coal plants and gas facilities in other states, we do care very much what happens in those other states.

Chairman SMITH. And I saw one chart that indicated electricity rates would actually go up in Oregon. Is that possible?

Mr. EISDORFER. I think that's a possibility.

Chairman SMITH. Okay. Thank you, Mr. Eisdorfer.

I yield back, Mr. Chairman.

Chairman BRIDENSTINE. The Chairman yields back.

I now recognize Ms. Edwards from Maryland for five minutes.

Ms. EDWARDS. Thank you very much, Mr. Chairman, and thank you to the witnesses today.

I just wanted to highlight, Mr. Chairman, that we've been hearing a lot about the steps that are necessary to address climate change by reducing carbon emissions, and its equivalent is setting our economy on fire. That's some of the accusations. But it's actually not the case. The efforts of Maryland—and I would note that Maryland on that Chamber of Commerce chart is a little deceptive, so it makes me question those other red states on there. But the efforts of Maryland and other states that have been involved in the Regional Greenhouse Gas initiative are proof that environmental protection and robust economic development can and should go hand and hand.

I have a recent review of the Regional Greenhouse Gas Initiative by the Analysis Group that I want to submit for the record. The report finds that over the last three years, the Regional Greenhouse Gas Initiative has produced a net economic value of \$1.3 billion and 14,200 jobs, and this is on top of the \$1.6 in net economic value and 16,000 jobs created over the first three years that were analyzed under the program. Additionally, energy bills in my state and the other participating states in this regional initiative declined between 2012 and 2014 with consumers saving \$460 million. Overall, the initiative has achieved a 40 percent reduction in greenhouse gas emissions compared to 2005 levels while the regional economy has grown eight percent, and in fact, Maryland has been very supportive of the rule that we're discussing today, and began under this regional initiative CO₂ emissions reductions under RGGI that have reaped over \$200 million from credits. They've used those. We've used those in our state for grants for renewables, for solar panels, for helping low-income people with utility bills, and for rebates for energy-efficient appliances. And so I am grati-

fied that the EPA has introduced this rule and is preparing to finalize it and is preparing to finalize it because I think it's going to be a great economic benefit for our state, for this Nation, and frankly, for our future.

Maryland relies heavily on the economic generation of income from the Chesapeake Bay as do the other states in the region, and so we can't even afford even a little bit of an increase in sea level because it would impact our economy tremendously, and so I'm gratified for the EPA's work.

Let me just say as well, and I'm going to read directly from the U.S. National Climate Assessment and the U.S. Global Change research program that was published in May of 2014. Finding five of a number of findings, human health. "Climate change threatens human health and well-being in many ways," I quote. "Climate change is increasing the risk of respiratory stress from poor air quality, heat stress and the spread of foodborne, insectborne and waterborne diseases. Extreme weather events often lead to fatalities and a variety of health impacts on vulnerable populations including impacts on mental health such as anxiety, post-traumatic stress disorder. Large-scale changes in the environment due to climate change and extreme weather events are increasing the risk of the emergence or reemergence of health threats that are currently uncommon in the United States such as dengue fever. Key weather and climate drivers of health impacts including increasingly frequent, intense and longer-lasting extreme heat, which worsen drought, wildfire and air pollution risk, increasingly frequent extreme precipitation, intense storms and changes in precipitation patterns that could lead to flooding, drought, and ecosystem changes, and rising sea levels that intensify coastal flooding and storm surge causing injuries and deaths, stress due to evacuations, and water quality impacts, among other effects on public health." And so I would welcome any submission for the record that would refute the findings of the climate change impacts in the United States and those highlights as published in May of 2014.

And then lastly, just as we close out, for our witness from Oregon—thank you for the work that you are doing—I wonder if you can talk about any regional efforts that you're involved in and whether you think that you might change some of your work in the region over these next several weeks, months and years. Thank you.

Mr. EISDORFER. Thank you, Congresswoman. Two quick things. One, the Northwest has acted as a region for many, many years, so Washington, Oregon, Montana and Idaho are usually in a constant state of discussion, and so this is no exception. We're having those kinds of discussions.

Another kind of regional discussion that we're having is the PacifiCorp service territory is six states that includes Washington, Oregon, Wyoming and Utah, and they—their resource fleet is heavy on coal and so that utility is significantly impacted by the rule, and so discussions between those states are in the offing. They will be coming and we'll be discussing what is the least-cost way to approach compliance.

Ms. EDWARDS. Thank you, Mr. Chairman.

Chairman BRIDENSTINE. Thank you.

I now recognize Mr. Abraham from Louisiana.

Mr. ABRAHAM. Thank you, Mr. Chairman.

This, once again, in my opinion, is the EPA doing a little malpractice of manipulating data to fit their goal instead of using this data objectively to actually formulate a coherent plan.

I'll make a brief mention to Ranking Member Johnson and Ms. Edwards as far as wanting some documentation as far as whether this climate change, which I assume is global warming the way they are playing it, I am a practicing physician that does treat respiratory conditions and surely asthma and—Administrator McCarthy has often tried to refer to children's asthma as something that she uses to try to sell her points. But if you look at the data, the objective data from an unbiased source, which I have to, that's the CDC, and if you look at states like California who have some of the cleanest air in the nation, they still have the highest asthma rate and they have increasing asthma rates. So if we want to compare apples to apples, you are right, Chairman Shaw, in that CO₂ certainly has no role in respiratory asthma as far as exacerbating it.

So saying that, you know, we do have actually objective data that proves your point. I'll refer also to this report that has been touted, and I will that if it has not already been done, that it be inserted into the record.

Mr. Eisdorfer, from this report, it says that Oregon stands to make or benefit from up to \$125 million. Would you agree with that?

Mr. EISDORFER. I'm sorry. I just don't have the ability to—

Mr. ABRAHAM. Well, it's a good—you know, I'm assuming it's a good report. It looks to be fairly unbiased, so I will again to submit it to the record, and I'll stay with you, sir. The way I understand it, Oregon has only one coal-fired plant?

Mr. EISDORFER. Yes, that's—

Mr. ABRAHAM. And it's supposed to go down or shut down in 2020?

Mr. EISDORFER. Yes. There's the Boardman plant. Its useful life was to go out to the year 2040, and there was a discussion that began about 2006, 2007 by stakeholders, utilities and the regulators, and a least-cost, least-risk analysis was done, and the result of that was, it was in the customers' interests, it was less costly to actually shut the plan down early rather than retrofit it with non-Clean Power Plan environmental technologies. So it was actually cheaper to shut it down and less riskier to shut it down in 2020 than the full 2040.

Mr. ABRAHAM. Under the power plan, will Oregon be allowed to emit more carbon or less carbon? The way I read it, it's more actually. What's your take on that?

Mr. EISDORFER. From the baseline from 2012, Oregon's not going to be able to emit more carbon than from that baseline.

Mr. ABRAHAM. Okay, and I will probably respectfully disagree reading the report, but I will defer to sources for that.

Chairman Shaw, would you agree that with this BSER methodology, that this is an overreach of the federal government?

Dr. SHAW. Clearly, this is exceptional from what I think the clear reading of the 111(d) statute prescribes.

Mr. ABRAHAM. Okay. And that's all I have, Mr. Chairman. I yield back.

Chairman BRIDENSTINE. The gentleman yields back.

I now recognize Mr. Foster from Illinois.

Mr. FOSTER. Thank you, Mr. Chairman.

Director Butler, I understand one of your fundamental objections is that what is proposed is to replace an economic model for determining the energy with one that includes environmental factors, and so first is just a simple question. How many people die in Ohio each year as a result of power plant emissions?

Mr. BUTLER. Representative Foster, thanks for the question. I don't know the exact number to your question but my premise—

Mr. FOSTER. Roughly, factor of two.

Mr. BUTLER. I don't know. I'm not a physician.

Mr. FOSTER. Okay. Well, it's certainly surprising, because that seems like a fundamental question here.

Let's see. I actually do have an estimate, if we could have the thing—this is an estimate from—someone by the Clean Air Task Force put this together based—I think it's primarily driven by particulate emissions, and it looks like—you sort of do an eyeball average—about 10 people in 10,000—10 in 100,000. About one in 10,000 die each year in Ohio, roughly in a typical area of Ohio, if this data is correct, and Ohio, I think, has something like 10 million people, so we're talking thousandish, roughly a thousand people per year die because of particulates from coal plants.

So I was wondering, from a purely economic point of view that you advocate, what is the economically optimum number of people to die in Ohio each year?

Mr. BUTLER. Representative Foster, so Ohio is about 11-1/2 million people, and ultimately I think the chart that you're showing and the argument that you're making is around something that Dr. Shaw talked about, this issue about these co-benefits of the Clean Power Plan. I mean, you're talking about—this is about issues around particulate emissions. It has nothing to do with CO₂ emissions under the Clean Power Plan.

Mr. FOSTER. Right, but this hearing is about closing plants.

Mr. BUTLER. This hearing is about—

Mr. FOSTER. The title of the hearing is "closing plants," right?

Mr. BUTLER. Right.

Mr. FOSTER. SO the co-benefits—I do not understand the argument that when you complain about the cost of something, you don't include the economic co-benefits, but that's a separate issue.

But I was wondering just in general, you know, if you for whatever philosophical approach to this you take, how would you calculate the economically optimum number of people to die in Ohio each year? What are the inputs into that?

Mr. BUTLER. Sure. Representative Foster, we care about all 11-1/2 million Ohioans, and this hearing today is about the Clean Power Plan. It is about the CO₂ emissions that are supposed to be reduced from the Clean Power Plan. We take seriously, and as you have seen in my remarks also that Ohio has reduced its not only CO₂ emissions but we've reduced our sulfur dioxide—

Mr. FOSTER. I'm asking you the general question. How do you do the optimum plan? In your point of view, you know, do you believe

that the optimum number of people to die from particulates in Ohio is zero or some number bigger than zero? And how, from your philosophical point of view, do you calculate the optimum number of people to die each year?

Mr. BUTLER. Sure. Representative Foster, so we benefited from an all-fuels approach in the State of Ohio. So not only do we have coal plants, we've got hydroelectric plants, we've got energy efficiency, we've got natural gas, we've got wind, we've got solar. We think that it is in our best economic and environmental interest to have all of those in Ohio and we'll strive to continue to do that.

Mr. FOSTER. But ultimately, you have a philosophy that tells you how to optimize that mix, well, maybe purely economic or a combination of economic and environmental aspects, that allows you to calculate the number of people who should die in Ohio each year. How do you—how would you advocate determining that number? For example, does it include the health effects in the downwind states? If emissions from Ohio kill people in downwind states, should that be included or not? If the emissions from Ohio raise CO₂, we lose the Greenland ice sheet and, you know, 75 years from now people die in coastal areas, should that be included or not? You know, how large is your commons that you're looking at here?

Mr. BUTLER. Representative Foster, so the way that we look at this in Ohio is that again, it's an all-fuels approach, and whether or not you want to—what we don't account for is the notion in the Clean Power Plan is that we'll see any impact to human health because of emissions that are regulated under the Clean Power Plan. We take into development of our plan not just clean power but how we look at our energy mix based on an economic model. It is also based on looking at environmental protection is included my role as Director of being protective of human health and the environment. So it's always a balance, and how we try to balance with perspectives. We work closely with the Public Utilities Commission, all of our utilities, to try to set up what that appropriate—

Mr. FOSTER. All right. What I'm fishing for is, what is the balance of, you know, human suffering and death versus economic goals? Because it seems like there's a big disconnect and we're talking past each other—

Mr. BUTLER. Sure.

Mr. FOSTER. —on this where, you know, one side of this hearing room, people seem to be, you know, ignoring anything regarding quality of life or ultimately death, and versus pure economic concerns. I was wondering how you handle that and what is the objective function you're optimizing for from a mathematical point of view? Does it take into account the number of deaths in Ohio, or not?

Mr. BUTLER. Well, Representative, I'll just tell you, I think your line of questioning's really unfair from the perspective of what this hearing is about. It's about the Clean Power Plan. It's about looking at CO₂ emissions relative to the Clean Power Plan. You know, we have addressed—

Mr. FOSTER. The title of the hearing is that the Power Plan will shut down power plants. We're talking about shutting down certain kinds of plants.

Anyway—

Chairman BRIDENSTINE. The gentleman's time is expired.

Real quick, could you answer the question? Is there already a National Ambient Air Quality Standard for particulate matter? That already exists. Am I incorrect?

Mr. BUTLER. Mr. Chairman, that's correct.

Chairman BRIDENSTINE. Okay. Very well.

I now recognize Representative Moolenaar from Michigan.

Mr. MOOLENAAR. Thank you, Mr. Chairman.

I wanted to follow up on some of the questions regarding the Clean Power Plan rule and the safety valve provision. According to the EPA, this would give states a 90-day period to exceed carbon limits during emergencies, and EPA has indicated that although this safety valve exists, it would be rarely used.

Mr. Shaw and Mr. Butler, I wonder if you could address the safety valve provision and give us your thoughts on that?

Dr. SHAW. Thank you. While I certainly am appreciative that there's a recognition that this rule could lead to reliability issues, some of the challenges and concerns with the safety valve approach is that in order to have allowing generating to operate beyond what's permitted and allowed in those extreme circumstances, there's two issues. One, the EPA has not made it clear what those extreme circumstances are, and so it's going to be rare, would you be able to rely on it, and two, one of the outcomes of this rule as I see it with the extreme advancement in renewables energy is going to make it much more challenging for us to be able to account for baseload and maximum peak load at times when the wind is not blowing, which in Texas, by the way, they're about 180 degrees out of phase. And so part of what that's going to mean is, we may not have generation available in our market to turn on because it's difficult to justify cost of building new generation capacity when you may only be able to operate for a few hours a year and only during those extreme circumstances, and those rates are going to have to be extremely high to warrant those multimillions if not billions of dollars in investments.

Mr. BUTLER. Representative, so I think my comments would be very much and similar to Dr. Shaw in the sense that the way that we look at this reliability safety valve on the one hand, we are appreciative because I think it was one of the probably most mentioned concerns that states had raised with EPA as well as our Public Utilities Commission around the notion that they were going to be setting up through the Clean Power Plan really constrain zones and putting in a position where we would have unreliable power supplies at certain times. So what I will tell you is, I think we'll have to go on what I've heard is the Public Utilities Commission, FERC and U.S. EPA have signed a memorandum of understanding. I think they are still trying to figure out the dynamics of that as all—as we are as well. So we appreciate that there is this reliability safety valve. I think it's unknown at this point whether we think that it will actually be effective. I've heard the FERC talk about the reliability safety valve from the perspective while they have a memorandum of understanding, it really is in the details, which are yet to be developed.

Mr. MOOLENAAR. Okay. Thank you.

I also want to get back to this question of getting credit for—and maybe have all three of you address this issue. For energy efficiency changes or reduction in greenhouse gases, different plans that you've implemented in your state prior to 2012 that you don't get credit for, could you talk about that aspect? Because that's a concern I've heard from constituents as well.

Dr. SHAW. I'll quickly talk about the case for Texas. With regard to, for example, renewable energy, we've had a very significant increase where about ten percent of our electric generation is from wind power that was accomplished through about a \$7 billion investment in transmission lines to make that occur and a very dedicated effort, and that peaked right—because in 2012 in the mix of things, credits were going to be expiring and so you had this cliff where lots of wind power was installed, a lot of expenditure was made, but then we don't get credit because the baseline was drawn after that occurred.

Mr. BUTLER. Representative, I'll echo that. One of our very chief concerns in comments we made in our draft comments on the Power Plan which has yet—was unaddressed and yet to be addressed still is this notion of first movers like the State of Ohio, like the State of Texas where we have—we've had an aggressive renewable portfolio standard in the State of Ohio since 2008, had targets for renewables, set targets for solar and energy efficiency, hitting targets by the year 2025. To be told that, frankly, because we were first movers and we were aggressive in implementing those across the state, to be told that those efforts between 2005 and 2012 don't count is frankly very, very disappointing to us and puts in a very deep hole. Number two, I think even more so, recent—very recent conversations with U.S. EPA and our modeling looking at the finalized Clean Power Plan is that many of our renewable portfolio standard activities going forward even after 2012 will not count because they don't qualify under the measurement and verification requirements that U.S. EPA has put into the final rule.

Mr. EISDORFER. Congressman, very quickly, one of the things I said earlier is that Oregon was beginning to look at the mass-based approach, and under that approach, any energy efficiency with a measure life that extends past into—after 2022 and into the compliance period in a sense very much does count to the extent that it causes the utilities to have to invest or operate their thermal generation that much less. So under mass-based approach, mass-based and rate-based treat energy efficiency differently. Under a mass-based, all energy efficiency you do, if the measure life extends into the compliance period, that's a really good thing.

Mr. MOOLENAAR. Mr. Chairman, I yield back.

Chairman BRIDENSTINE. The gentleman yields back.

The gentleman from Ohio, Mr. Johnson, is recognized for five minutes.

Mr. JOHNSON OF OHIO. Well, thank you, Mr. Chairman, and I'm glad I was able to make it back.

Director Butler, earlier this year in testimony before the Energy and Commerce Committee, as I recall, you stated that EPA's Clean Power Plan had not been well designed and that the rule was rushed out the door to meet a predetermined schedule. So question for you. Now that EPA has released the final Clean Power Plan

rule, do you still feel that the final rule has some of the same flaws that existed in the proposed rule?

Mr. BUTLER. Representative Johnson, thanks for the question. I think that they obviously made some adjustments in the final rule, and I think as I made it brief in my remarks today, we still have many of those questions remain and there are certain new ones too. The actual final Clean Power Plan is dramatically different. A lot of the—many of the targets haven't changed. It's like the titles of the book haven't changed but all of the pages are different. We're going through that analysis of this 1,500-page rule as it's in completion, and that is one of the reasons why today I called for EPA ought to at a very minimum re-release this rule as a draft so that we ought to be able to—rather than having to implement the rule immediately at the same time we're reviewing it, give us and all the stakeholders an opportunity to review it.

I will also just mention the idea that U.S. EPA had made some assurances that as soon as August 3 when they released this rule that beginning in the first week of September they anticipated this rule to be issued as final. They have deferred and moved away from that position. I think they've given a date sometime in late October, which really puts us in a position where U.S. EPA will finalize that rule, they will take comments on the also corresponding federal backstop plan for 90 days after that time period, which would take us into February, all the while still requiring states to be able to submit a plan by September 2016. Those dates are just unrealistic for us to meet.

Mr. JOHNSON OF OHIO. Sure.

Mr. BUTLER. So I think ultimately there are still many more questions that have been even—have been raised even in the final plan that we're still unclear about, and frankly, U.S. EPA has not been able to answer those questions for us.

Mr. JOHNSON OF OHIO. Okay. Well, you've answered several of my additional questions.

Let me turn to another issue that we've talked about before in some of the hearings and testimonies. For Chairman Shaw and Director Butler, it appears that one of the changes between the final and proposed Clean Power Plan rule is the amount of coal-fired power plant retirements reflected in the base case, the scenario that analyzes the current state of affairs without the Clean Power Plan. It appears that the EPA believes that 27 percent or 78 gigawatts of coal-fired electricity in existence three months ago will close by next year even without the implementation of the Clean Power Plan. EPA claims that it made this change based on stakeholder comments submitted on the proposed rule.

So my question, Chairman Shaw and Director Butler, did your agencies and the States of Texas and Ohio submit comments for the record regarding EPA's proposed Clean Power Plan rule?

Dr. SHAW. Yes, we did.

Mr. BUTLER. Representative Johnson, we submitted over 600 pages of comments on the Clean Power Plan.

Mr. JOHNSON OF OHIO. Great. For you both, Chairman Shaw and Director Butler, in your comments on the proposed Clean Power Plan, did you provide comments regarding the number of coal-fired

retirements that would occur as a result of other EPA rules such as the Mercury Air Toxics Rule?

Dr. SHAW. My agency did not. Our Public Utilities Commission perhaps may have.

Mr. BUTLER. Representative Johnson, we did, and we still, as I testified today, just by the mercury, the mass rules that were responsible for closing 25 percent of our megawatts in Ohio, so just over 6,000 megawatts of power turned off this year because of the mercury standard.

Mr. JOHNSON OF OHIO. Okay. Final question for the two of you. In your opinions, what stakeholder groups would have submitted comments that would have led the EPA to make changes to its base case scenario for the amount of coal-fired retirements, and do you believe that these comments were only submitted in an attempt to make it appear as though the Clean Power Plan was less onerous to the states?

Dr. SHAW. I don't know what groups submitted comments that they were able to base that on, and certainly it does seem especially with the overly aggressive renewables energy goals that they have that one could conclude that it appears that they were more concerned with getting a 30 percent reduction than in determining what BSEER was for the different facilities.

Mr. BUTLER. Representative, I concur with that. I still believe that there was a predetermined number or a conclusion before the plans ultimately were developed.

Mr. JOHNSON OF OHIO. Got it. Okay. Well, we've heard this before, Mr. Chairman. You know, you got to pass it before you know what's in it. You got to define it before you do the analysis. I mean, that's just a pattern of this Administration in so many areas, and this is another one of them. I yield back.

Chairman BRIDENSTINE. The gentleman yields back.

Without objection, I have a letter here from the Governor of Ohio, John Kasich. It's a request to suspend implementation of the Clean Power Plan. Without objection, I'd like to have this letter entered into the record.

[The information appears in Appendix II]

Chairman BRIDENSTINE. I now recognize the gentleman from Alabama, Mr. Palmer, for five minutes.

Mr. PALMER. Thank you, Mr. Chairman.

It was with great interest that I followed your testimony a few minutes ago, several minutes ago, Chairman Shaw, that this is really not about air quality, it's about climate change, which I think raises some questions as to whether or not this should fall under the purview of the EPA since their primary responsibility under the Clean Air Act was air quality. That said, one of the things that concerns me about this along that same line is your excellent analysis of the scientific evidence to the contrary of what this will actually do for climate change, the very limited impact.

The one thing that you didn't cover that I'd like for you to comment on is that there's recently a report from a former lead author of the International Panel on Climate Change, Dr. Philip Lloyd from South Africa, who says that the majority of climate change that we're seeing is due to natural variations. Are you familiar with that?

Dr. SHAW. I may have. I didn't recognize it from the author's name but I have read material similar to that.

Mr. PALMER. I think this guy obviously has an excellent reputation in the scientific community, given that he was a lead author of the IPCC, one of their lead authors of the IPCC report. So I think it's sensible then to suggest that the EPA is imposing an enormous economic burden on the families of America for little or no impact.

Dr. SHAW. And Congressman, I think that as you even look into the material, not the summaries but look into the material of even previous IPCC reports, you go back a few years and the message wasn't that climate change, manmade climate change is causing all these issues, it's that we've seen a natural climate change and the concern was that manmade emissions might accelerate that to lead to events, and then there was a shift, it seems to me, that seemed to suggest that all weather variability and any unusual weather became accredited to climate change, and I think it seems to support what the more robust review of the scientific record reflects.

Mr. PALMER. That came after they realized that we haven't had any temperature increase in 18 years and there was no evidence to support that, so they just changed the dialog from global warming to climate change.

Mr. Eisdorfer, in regard to this impact that this is going to have and your assertion that there's some association with health benefits and particularly asthma, there's a study out of UCLA, there's several studies to indicate that the single biggest predictor of asthma is income. It's not air quality, it's income. How do you respond to that?

Mr. EISDORFER. Representative Palmer, not really my area of expertise. It may be that low-income folks tend to be downwind from generating facilities.

Mr. PALMER. No, sir.

Mr. EISDORFER. I'm not really sure what the answer is.

Mr. PALMER. No, sir, it's the proximity to traffic and things like that may have some impact but the study indicates that the majority of this is low-income families, and I want to continue on that line and point out that the National Black Chamber of Commerce is opposed to the Clean Power Plan, and they've pointed out that if this goes into effect, that poverty rates among black families will go up 23 percent, among Hispanic families it'll go up 26 percent. And the states that have already implemented a renewable power plan such as Maryland, who began this initiative in 2005, their power rates have gone up—their electricity power rates have gone up 61 percent. So you're imposing an enormous burden on families through this rule that I don't think the EPA has taken into full consideration.

There's one other thing about this too is how it impacts senior households, basically low-income houses. They're below 34,000, I think, in median income, and there's a report that came out that indicated that you've got households, 41 percent of seniors went without medical or dental care because they had to make a choice between that and paying their energy bill, 30 percent went without food for a day, 33 percent did not fill out a prescription or took less than a full dose.

You know, this is the real impact of the regulations that the EPA is imposing. This is just some pie-in-the-sky stuff. This is how it impacts real people. It costs jobs. The Black National Chamber of Commerce is estimating that they'll lose literally hundreds of thousands of jobs among black workers and hundreds of thousands of jobs among Hispanic workers. That's the real impact. It's not some issue of we may stop this unproven idea of climate change. That's the real impact.

Chairman BRIDENSTINE. The gentleman's time is expired.

Mr. PALMER. Thank you, Mr. Chairman.

Chairman BRIDENSTINE. The gentleman's time is expired.

I'd like to recognize Ranking Member Bonamici for—she'd like to make a submission for the record.

Ms. BONAMICI. Thank you, Mr. Chairman. I would like to submit to the record a letter written to the Administrator of the U.S. EPA by the Attorneys General of New York, California, Connecticut, Maine, Massachusetts, New Mexico, Oregon, Vermont, Washington, the District of Columbia, and the Corporation Counsel of the City of New York dated August 3, 2015, in which this group of Attorneys General and Corporation Counsel wrote that the power plant rules issued today are the product of an unprecedented effort by the EPA to solicit public input including from states, cities, non-profit organizations and industry. They write in strong support of the final rules, stating that the rules are firmly grounded in law, and I would like to submit this for the record, Mr. Chairman.

Chairman BRIDENSTINE. Without objection, so ordered.

[The information appears in Appendix II]

Chairman BRIDENSTINE. And of course, the states that are going to benefit from the Clean Power Plan financially would be the ones that would sign that letter.

I'd like to recognize Dr. Babin from the great State of Texas.

Mr. BABIN. Yes, sir. Thank you, Mr. Chairman. I appreciate that you said "great."

I have a lot of concerns with the EPA's final rule for the Clean Power Plan. While it's an improvement over the proposed rule, it goes too far with unrealistic expectations for reducing carbon emissions and lacks clarity in other areas. For example, I have a new biomass plant in my district that uses forest waste for fuel. Under the Clean Power Plan, it's not clear if this plant would be treated as a renewable facility for purposes of emission counting. Has EPA provided you, Dr. Shaw, Chairman Shaw with the TCEQ, with any more guidance on how these facilities will be handled under the Clean Power Plan?

Dr. SHAW. That is one of those areas that still remains very elusive to get a good answer to, and our fundamental understanding.

Mr. BABIN. Okay. Thank you. There's a lot of folks that are worried about that in my district.

And also, Dr. Shaw, I have several coal-fired plants in my district. In fact, surprisingly to many Texans, 65 percent of our energy is produced in coal-fired plants no matter how cheap natural gas is. Do you believe that this new rule will kick-start a transition away from coal toward renewable energy in Texas causing a number of coal-fired power units to retire?

Dr. SHAW. It seems that there's no other outcome then in order to meet the rule would almost dictate require closing and at least throttling back to a point that they're no longer economically feasible to maintain many coal-fired power plants.

Mr. BABIN. So war in coal is kind of a good name.

If so, how will this affect the economy and jobs in my district? Won't this raise prices and affect reliability of our energy?

Dr. SHAW. Congressman, I think based on the fact that especially ERCOT and I think your district is in the ERCOT region is an energy only competitive market which has led to, for example, last time our checked, our electricity utility rates were about 30 to 35 percent lower than the RGGI states' utility rates. That's been because we've incentivized the most efficient generation capacity. Anything that makes us depart from that is going to necessarily increase electricity rates, and in fact, the jobs that are utilizing that energy.

Mr. BABIN. Thank you.

And directed at you again, Dr. Shaw and Director Butler, when Administrator McCarthy was here and testified before the Science Committee back in July, she stated unequivocally that the EPA's regulatory agenda relies on science that is accessible and transparent. Do you agree that with regard to the Clean Power Plan, the EPA has promulgated this rule in transparently and that all aspects of the rule including the calculation of benefits rely upon science and data that have been publicly made available?

Dr. SHAW. I think that is a stretch, and certainly we're still digging our way through the 1,500 pages so maybe we've missed it in their somewhere, Congressman, but it is a challenge to understand the basis, and I think part of that is because it's very difficult to quantify some of the benefits because it's difficult to quantify the benefit of a hundredth of an inch of sea-level-rise change.

Mr. BABIN. Mr. Butler?

Mr. BUTLER. Representative Babin, I would agree with Bryan, my colleague. Relative to transparency, maybe I'll transition and just mention one other issue relative to transparency. U.S. EPA often—the Administrator often talks about the unprecedented level of outreach that they've done and that they held lots of public hearings. I know the States of Ohio, West Virginia and Kentucky, we asked the Administrator to hold one of those public hearings somewhere within one of our three states so that they could see and get firsthand information from those the most dramatically affected by the Clean Power Plan, coal miners and coal-fired—folks that work at coal-fired power plants. The closest they got was Pittsburgh for having one of those public hearings, and frankly, the level of transparent interaction, I think it was more of just a traditional top-down regulatory approach. They developed this Clean Power Plan under their own model, handed it to the states. We got an opportunity to provide some comment but ultimately I think they're still continuing down along the strategy that they had all along.

Mr. BABIN. Absolutely. Thank you. I think we can see a little more transparency myself.

I want to thank all the witnesses, and Mr. Chairman, it seems that if you give them an inch, the EPA will take a mile. This plan is another overreach by this Administration and I hope not just for

the sake of my home State of Texas but for the entire country, we as a Congress will be able to do something about this final rule.

Thank you, and I yield back the balance of my time.

Chairman BRIDENSTINE. I'd like to thank the doctor from Texas.

I now recognize the gentleman from Texas, Mr. Weber, for five minutes.

Mr. WEBER. Thank you, and Chairman Shaw, I'm going to start with you. Thank you for being here. I didn't get to hear your testimony. I came in late. Apparently I was out too late last night.

But you mention in your testimony that the EPA seems to be choosing energy sources that they prefer, and Mr. Westerman actually said in his comments earlier that it looks like they're in the business of picking winners and losers, and I appreciate your comments when I was here about this adversely affecting low-income people, especially in Texas, since we have our own grid at 85 percent, as you know, ERCOT. So what you're saying is that this is actually going to adversely affect low-income people more so than others.

Dr. SHAW. Yes, Congressman. I don't see a way that—when you look at a methodology that changes from dispatching determining what your generation source is going to be based on the economics, which is what our system, especially in the ERCOT region, is based on, that a system that changes that and says create new generation sources that didn't meet that test, that aren't as cost-effective, and then dispatch based on greenhouse gas emissions alone, that's necessarily going to raise the cost, the rate, if you will, of that electric generation.

Mr. WEBER. Well, that's fascinating. I followed your exchange with, I think, my colleague from Maryland and also from the north part of Texas. Our colleague from Maryland seemed to list just a whole bunch of bad things that were going to happen, all kinds of illnesses, fires and bad weather. She got down and she even said heat. I think she said heat stress, which low-income people would actually when their electricity bill goes up be more prone to turn off their air conditioning and probably accede to heat stress. She had quite a long list of bad things the EPA's apparently trying to prevent. The only thing she left out was mumps and measles. And so I was appreciating your comments to the colleague from Texas that actually this is about CO₂ and that doesn't cause—I mean, CO₂ doesn't cause asthma.

You also said something I think 100—or Chairman Smith might have said one-hundredth of a degree Fahrenheit, an unmeasurable raise. Is that what he said?

Dr. SHAW. I said that as well. The Chairman may have mentioned that as well. That's from EPA's—

Mr. WEBER. And then one one-hundredth of an inch sea-level rise.

Mr. Eisdorfer, let's go over to you. You seem to be in favor of the plan. One one-hundredth of an inch, I was fascinated by Chairman Smith's comment that that's three pieces of paper. Three pieces of paper. So if we're going to disadvantage some low-income people, and by the way, the EPA cost estimate of this was \$9 billion. If you divide that out by 50 states, it's \$180 million per state, just FY I. A hundred and eighty million dollars per state. If we're going to

disadvantage low-income people and cause their electricity prices to rise, Mr. Eisdorfer, how many sheets of paper would you add to that pile to disenfranchise what percentage of the elderly and the low-income? Would you add one sheet to increase the number of disadvantaged economically by this? I mean, is it worth that I guess is what I'm saying?

Mr. EISDORFER. Congressman Weber, it's absolutely worth it. It is——

Mr. WEBER. It is worth it to add one sheet of paper to sea-level rise to actually economically disadvantage how many, one percent of the elderly in Oregon?

Mr. EISDORFER. So we're talking about climate change as if it were an environmental issue and this is a one side versus the other side kind of thing. I tend to see climate change almost entirely as a social and societal issue. The Earth is going to take care of itself. The issue is, how is humanity going to fare in it, and the Clean Power Plan is not the cure-all but it is the start, and it's sort of interesting to me, in this discussion we're talking about the economics of the plan. We haven't talked a lot about the economics of the built environment in Miami or Manhattan.

Mr. WEBER. Let me stop you there. I'm running short on time. When you talk about states being socioeconomic and you said it's not about environment, which is really interesting to me, so if you're concerned about people and society—Mr. Foster was saying that a thousand people, I think, would die in Ohio from—in his exchange with Director Butler from coal-fired plants. The truth of the matter is, and I did some Citicorp—this Citi data.com research real quick. People are leaving Ohio because there's no jobs, and actually 2,800 of them left in 2008 alone and came to Texas. If you looked back and you did some more research, Chicago Tribune will tell you that July 2013 to July 2014, 10,000 people left and headed to Texas, Florida and California. So we have our great TCEQ Director or Chairman here. We understand in Texas we want clean air, we're doing a good job, so it is about society but it's doing it reasonably, and I don't think this EPA rule is reasonable.

Mr. Chairman, thank you for your indulgence. I yield back.

Chairman BRIDENSTINE. The gentleman yields back.

We have a request for another couple of minutes of questions from one of our Members, and Ranking Member Bonamici has been gracious enough to allow that, so I'm going to give her two minutes to ask a few more questions. Then I'll give our side another two minutes to ask a few more questions, then we'll close.

Ms. Bonamici, you're recognized.

Ms. BONAMICI. Thank you, Mr. Chairman.

Mr. Eisdorfer, I want to follow up on the discussion we were having about the changes that the EPA made in the final rule about the way it treats a number of renewable sources. We talked about biomass but also nuclear. Hydropower is very important. Oregon does not have any nuclear power plants. But can you talk about whether those changes in the treatment of renewables will affect the state's energy mix, and if so, how?

Mr. EISDORFER. Two changes. One, hydropower was not included in the baseline this time so the fact that Oregon is a hydropower state doesn't actually play into whether we are doing well or not.

And secondly, under the mass-based approach, any renewable investment that would allow a fossil fuel resource to be dispatched differently, dispatched less, and actually reduce emissions is a very good thing. So in that sense, any non-carbon-emitting resource that allows the existing thermal plants to operate differently is good for the state.

Ms. BONAMICI. Thank you.

And in my remaining minute, you said in your testimony that Oregon is not an island, and we've talked about the regional approach, but could you briefly mention the importance of the United States taking a leadership role in international efforts to reduce carbon emissions and lessening the risks and impacts associated with climate change?

Mr. EISDORFER. Well, two brief things. I've heard discussion here about sort of a top-down very heavy-handed approach, and unwittingly I think the EPA actually didn't do that. The Clean Air Act is a work between—is working—

Ms. BONAMICI. The Clean Power Plan?

Mr. EISDORFER. Well, the Clean Air Act itself actually requires the federal government and the states to work well together, and the Clean Power Plan itself is really offering opportunities for the states to work very well to come up and share with each other and learn from each other, and assuming we can do that, we can really show the world the kinds of opportunities there are to reduce carbon emissions at a very least-cost path, and so if we can do it, everyone else can do it. We just need to show the world that we can do it.

Ms. BONAMICI. Thank you.

Thank you, Mr. Chairman. I yield back.

Chairman BRIDENSTINE. I thank the Ranking Member, and the gentleman from Alabama, Mr. Palmer, is recognized for two minutes.

Mr. PALMER. Thank you, Mr. Chairman.

Chairman Shaw, the Supreme Court recently ruled that the EPA erred in issuing its proposal to limit mercury emissions from fossil-fuel-fired power plants. Unfortunately, a number of states had already implemented control technologies and shut down plants in order to comply. What I'd like to ask you, and Mr. Butler, you can respond as well, and we've only got a couple of minutes, so if you can, make it brief, should this give states pause when considering whether to comply with the Clean Power Plan?

Dr. SHAW. Certainly, Congressman, that's one of the great concerns. As I refer to it, it's the camel's nose getting under the tent, and that is the impacts of this rule will be irreversible in that decisions are already being made and the uncertainty is leading to decisions, and if this rule is not stayed, there are going to have to be decisions that are being made and frankly, coal-fired power plants are going to be making determinations, do I invest in some of the other regulations, some of which Mr. Butler talked about, in hopes that I'll still be allowed to operate under the Clean Power Plan. And so it's a great concern.

Mr. PALMER. Because I've only got a minute, let me direct this question to you, Chairman Butler. Would it be your opinion that submitting a state implementation plan would potentially put your

state and other states in a position of implementing costly regulations which might be struck down later by the Court?

Mr. BUTLER. Representative Palmer, that's exactly the point that we were making as well with a group of states asking U.S. EPA to stay the execution of this until all these legal challenges and uncertainty have been resolved. The MATS rule is a clear example in Ohio. It caused 6,100 megawatts of power to be turned off this year and it's irreversible. The Clean Power Plan is far more sweeping than the MATS rule. We would expect an even greater result if that were to go forward.

Mr. PALMER. I want to thank the Chairman and the Ranking Member Bonamici for allowing the additional questions. I yield, sir.

Chairman BRIDENSTINE. I'd like to thank the gentleman from Alabama, thank the witnesses for their valuable testimony. You want an additional two minutes as well? All right. The gentleman from Texas is recognized for two minutes.

Mr. WEBER. Thank you, Mr. Chairman. I appreciate your overriding generosity.

Chairman Shaw, as you know, in Texas in the 81st or 82nd session we passed a law the Governor signed into effect that says the TCEQ in promulgating rules and regulations has to take into account the effect on industry and the economic impact. So I think we get right in Texas. A lot of people are moving to Texas as everybody recognizes, and we do create a lot of jobs. What advice would you give us in this last minute or so about the EPA, how they might could do things better, making the air cleaner, the water cleaner but still helping our economy? What advice would you offer?

Dr. SHAW. Well, thank you, Congressman. I think I'll start with our mission. Our mission statement is effectively that we're to provide for clean air, clean water and the safe disposal of waste in keeping with sustainable economic development, and that's a recognition that we're not choosing the environment or the economics, one or the other; we're choosing to have both because we recognize that we have to have a strong economy to make further environmental investments and we have to have a clean environment to be able to track the kinds of jobs and businesses that people want to work in and raise their families around. And so my advice would be that if the EPA would focus and partner with states, recognizing that we want to protect our environment. We're looking for largely market-based approaches but certainly we want to be able to maintain our state's ability to customize those regulatory approaches to fit the specific dynamics of our state. We end up—and I think Texas is a great example. We're able to get greater results faster and more economically, and that helps to share them not only across the United States but even across the world as we do things more efficiently, others adopt those same techniques.

Mr. WEBER. Thank you, Chairman.

Mr. Chairman, I yield back. Thank you.

Chairman BRIDENSTINE. You've got 15 more seconds if you'd like it.

Mr. WEBER. Director Butler, this is a question—

Chairman BRIDENSTINE. Okay. Now I recognize myself to close.

I thank the witnesses for their valuable testimony and the Members for their questions. The record will remain open for two weeks for additional comments and written questions from the Members.

This hearing is adjourned.

[Whereupon, at 11:05 a.m., the Subcommittee was adjourned.]

Appendix I

ADDITIONAL MATERIAL FOR THE RECORD



ENERGY DARWINISM II

Why a Low Carbon Future Doesn't Have to Cost the Earth

Citi GPS: Global Perspectives & Solutions

August 2015



Jason Channell
Heath R Jansen

Elizabeth Curmi
Ebrahim Rahbari

Phuc Nguyen
Edward L. Morse

Elaine Prior
Seth M Kleinman

Alastair R Syme
Tim Kruger

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ENERGY DARWINISM II

Why a Low Carbon Future Doesn't Have to Cost the Earth

As Thomas Edison presciently pointed out to Henry Ford and Harvey Firestone in 1931, *"We are like tenant farmers chopping down the fence around our house for fuel when we should be using nature's inexhaustible sources of energy - sun, wind and tide. I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."*

While fossil reserves aren't running out, our ability to burn them without limit may be, due to the fact that atmospheric concentrations of CO₂ and equivalents are rapidly approaching the so-called 'carbon budget' – the level that if we go beyond is likely to lead to global warming in excess of the important 2°C level.

It is this that makes the United Nations COP21 meeting in Paris in December 2015 so important; it represents the first real opportunity to reach a legally binding agreement to tackle emissions, given that all parties, including the big emitters, are coming to the table with positive intentions, against a backdrop of an improving global economy.

We live though in an energy hungry world. Global GDP is set to treble by 2060, with two thirds of that growth coming from emerging markets which display significantly greater energy and carbon intensity per unit of GDP than developed markets. Feeding that energy demand and facilitating growth while minimizing emissions will take brave and coordinated decisions on the part of policymakers.

In this report, we examine the likely costs of inaction in terms of the potential liabilities from climate change to see whether we can afford not to act. We also examine whether the world can afford to act, by comparing the incremental costs of following a low carbon path to global GDP. Overall, we find that the incremental costs of action are limited (and indeed ultimately lead to savings), offer reasonable returns on investment, and should not have too detrimental an effect on global growth. Nevertheless, our energy choices will have a profound impact on countries, industries and companies, and we examine the implications of a low carbon future in terms of the stranded assets that are likely to result. Finally, we examine the solutions that financial markets and institutions can offer to facilitate this transition to a lower carbon world.

We are not climate scientists, nor are we trying to take sides in the global warming debate, rather we are trying to take an objective look at the economics of the discussion, to assess the incremental costs and impacts of mitigating the effects of emissions, to see if there is a 'solution' which offers global opportunities without penalizing global growth, whether we can afford it (or indeed we can afford not to), and how we could make it happen.

We believe that that solution does exist. The incremental costs of following a low carbon path are in context limited and seem affordable, the 'return' on that investment is acceptable and moreover the likely avoided liabilities are enormous. Given that all things being equal cleaner air has to be preferable to pollution, a very strong "Why would you not?" argument begins to develop.

With the global economy improving post-crisis, interest rates low, the large emitters coming to the table, investment capital keen, and public opinion broadly supportive, Paris offers a generational opportunity; one that we believe should be firmly grasped with both hands.

Action versus Inaction

Limited differential in total bill but potentially enormous liabilities avoided

CUMULATIVE CO₂ EMISSIONS ARE GETTING CLOSE TO THE 3,010 GT 'CARBON BUDGET'

1870	2.4
1910	159.5
1950	434.7
1970	740.0
2010	1844.5
2013	1960



1,050 GtCO₂ left to burn to have a 50% chance to reach 2°C

Source: Citigroup, Bédin et al. (2013), Hoegh-Guldberg et al. (2012)

GLOBAL GDP IS EXPECTED TO TREBLE WITH STRONG GROWTH FROM EMERGING MARKETS



2015
\$80 trillion

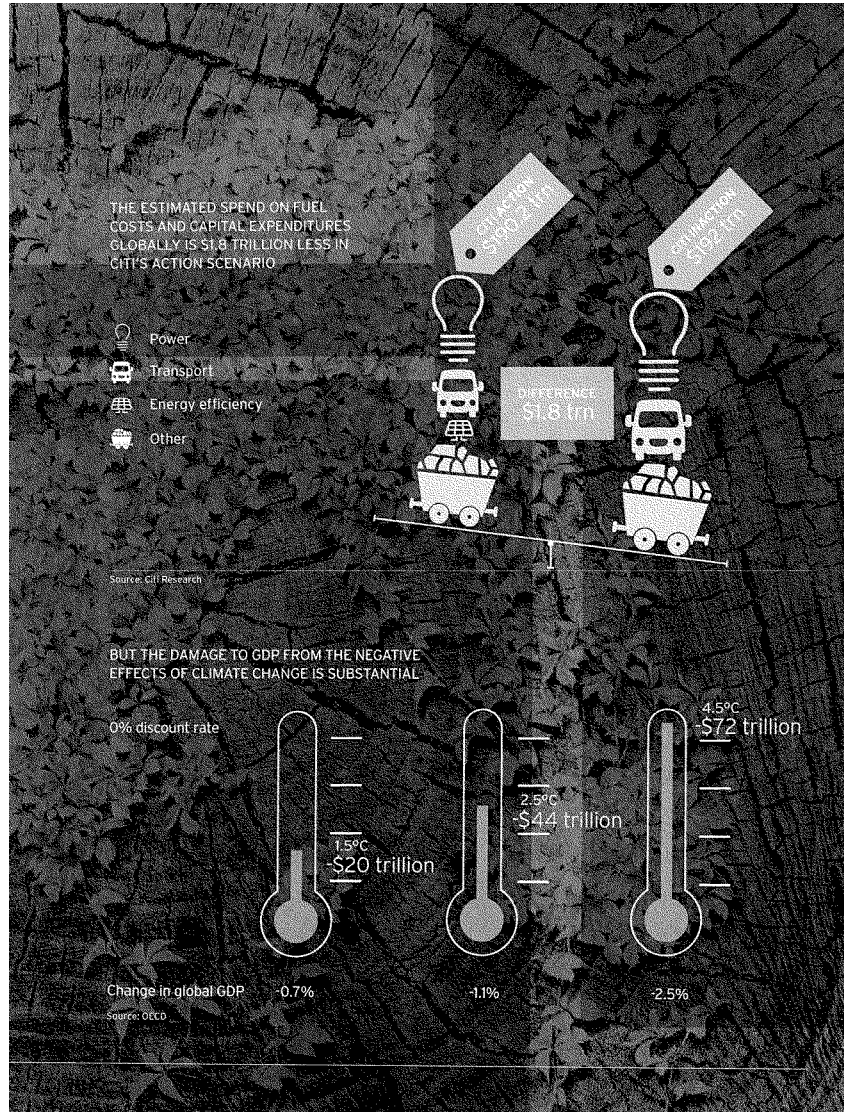


2060
\$260 trillion

2/3rds of global GDP growth is expected from non-OECD countries who tend to be more energy intensive

Source: OECD

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Attorneys General of New York, California, Connecticut, Maine, Massachusetts, New Mexico, Oregon, Vermont, Washington, the District of Columbia, and the Corporation Counsel of the City of New York

August 3, 2015

Gina McCarthy, Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Administrator McCarthy:

We, the undersigned state attorneys general and corporation counsel, write in strong support of the final rules issued by the Administration today that will, for the first time, limit the emissions of climate change pollution from new and existing fossil fuel-fired power plants under section 111 of the Clean Air Act. We are in the process of reviewing the rules but fully anticipate standing with EPA to defend these necessary emission standards if they are challenged in court.

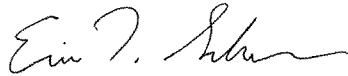
The power plant rules issued today are the product of an unprecedented effort by EPA to solicit public input, including from states, cities, nonprofit organizations, and industry. They also mark the culmination of a decade-long effort by our states in advocating for cutting climate change pollution from power plants – the single largest U.S. source of these emissions. Significant reductions in these emissions must occur to prevent increases in the frequency, magnitude and scale of the adverse impacts of climate change – including more heat-related deaths and illnesses; higher smog levels, increasing the rate of asthma, pneumonia and bronchitis; extreme weather, including storms, floods and droughts; threats to our food production, agriculture and forest productivity; and threats to our energy, transportation and water resource infrastructure.

The power plant rules will result in dramatic reductions in current and future emissions of climate change pollution. The limits on emissions from existing power plants alone are expected to eliminate 870 million tons of greenhouse gases by 2030, equivalent to the annual emissions of about 160 million cars. As such the rule will play an essential role in our efforts to protect our environment and public health, safety, and welfare from the harms of unmitigated climate change.

The rules are also firmly grounded in the law. The Clean Air Act requires EPA to regulate emissions of climate change pollution from new and existing power plants. Furthermore, the rules set reasonable limits on these sources as a result of a multi-year stakeholder process that drew heavily on strategies states have used to successfully cut power plant emissions while growing our economies.

In closing, we thank you, your Agency, and the Administration for your finalizing these critical rules, as well as your continued leadership in addressing climate change.

Sincerely,



Eric T. Schneiderman
Attorney General of New York



Kamala D. Harris
Attorney General of California



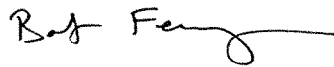
Maura Healey
Attorney General of Massachusetts



George C. Jepsen
Attorney General of Connecticut



Janet T. Mills
Attorney General of Maine



Bob Ferguson
Attorney General of Washington



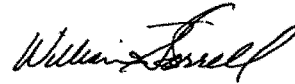
Hector Balderas
Attorney General of New Mexico



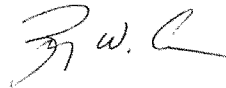
Ellen F. Rosenblum
Attorney General of Oregon



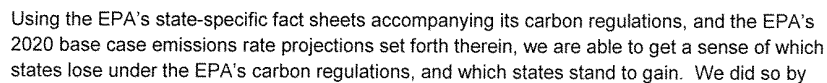
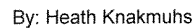
Karl A. Racine
Attorney General of the District of
Columbia



William Sorrell
Attorney General of Vermont



Zachary W. Carter
New York City Corporation Counsel



tracking the emissions rate reductions that would be necessary under the EPA's plan in each state from 2020 through 2030. Not surprisingly, our analysis found many more losers than winners. But these figures also reveal an intriguing image showing the geographic split among those winners and losers.

Based on EPA's own projections, nine states are actually permitted to increase their emissions rates from 2020 to 2030 while still achieving compliance with the agency's carbon mandate. How can this be if the aim of the EPA's rulemaking is solely to reduce carbon emissions from the United States power sector? Is redistribution a concurrent goal of the EPA's unprecedented regulatory regime, or just a coincidental outcome of complicated formulas and difficult projections?

Pursuant to the federal plan accompanying its carbon regulations, the EPA sets forth two alternative compliance pathways: "a rate-based emissions trading program and a mass-based emissions trading program." Thus, the EPA is coercing states to trade credits – a la cap and trade – in order to comply with its carbon emissions mandates. While rate- and mass-based projections and requirements vary slightly, the states that are assigned easier lifts in either circumstance may act as credit "banks" while the more numerous "debtor" states are saddled with challenging emissions reduction targets.

As a practical matter, what does this mean? For starters, creditor states will face reduced pressure to shut down affordable gas- and coal-powered electricity, thereby lessening the impact of the electricity price spikes expected from the rule. The ability to increase emissions rates will allow economic development to proceed with fewer restrictions, while states with strict targets are forced to curtail affordable energy in order to remain in good standing with the electricity overlords at the EPA. And for states that enter into cap-and-trade regimes (the EPA's heavily preferred compliance path), those allowed to increase carbon emissions can opt to sell credits to losing states, effectively cashing checks on the backs of states with steeper emissions reduction mandates.

For example, between 2020 and 2030, EPA's final rule allows Oregon to increase carbon emissions by 3.1 million tons of CO₂ annually—a whopping 63% jump. If the state so chooses, it could monetize that allowance which, at a reasonably expected price of \$40 per ton, could provide the state of Oregon \$125 million in annual revenue—paid for by losing states seeking to comply with the EPA's regulatory mandate.

It is also interesting to note that the states that are permitted to increase emissions rates happen to currently endure some of the highest electricity prices in the country. In fact, states such as those in New England, along with California and New York, are transformed from electricity price "losers" under their own restrictive state policies into EPA-imposed cap-and-trade "winners." Viewed another way, the EPA's rule will effectively nationalize the exorbitant electricity rates and cap-and-trade economies of the West Coast and Northeast, and force the rest of the country to foot the bill for those policies.

The story that this graphic unmistakably projects is one where the EPA is not solely looking to reduce carbon dioxide emissions. Instead, the EPA has picked winners and losers by imposing

a system that will drive up prices in low-cost electricity states and redistribute the revenues associated with those higher prices to select West Coast and Northeast states. Whether a direct objective of the regulation or a coincidental outcome, these disparities shine light on the inherent unfairness of the EPA's scheme, and ought to set off warning bells in the many states dealt the short end of the stick.



JOHN R. KASICH
GOVERNOR
STATE OF OHIO

August 28, 2015

The Honorable Barack Obama
President of the United States
The White House
1600 Pennsylvania Avenue, NW
Washington, DC 20500

Re: Request to Suspend Implementation of the Clean Power Plan

Dear President Obama,

Over the last year, Ohio went through an extensive process of reviewing and providing suggestions on your Administration's proposal to overhaul power generation, transmission and distribution systems by minimizing coal and natural gas as fundamental sources in our country's energy portfolio. Many of our comments were of a highly technical nature, and frankly, we were hoping the final version of the Clean Power Plan released on August 3 would have addressed more of our concerns.

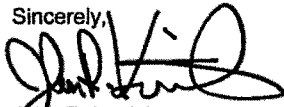
Access to reliable, abundant, and low-cost electricity is critical to Ohio's economy. For that reason, we have pursued an "all fuels" approach, which includes coal, natural gas, hydro, energy efficiency, and renewables. Unfortunately, the final plan appears to move away from such a balanced plan, which has served our state's economy well, while significantly reducing emissions and protecting public health. Specifically, between 2005 and 2014, Ohio has seen a 30 percent reduction in CO2 emissions from our coal-fired power plants. During the same period, Ohio has experienced even greater reductions of other air pollutants, including a 73 percent decrease in sulfur dioxide and 67 percent decrease in nitrogen oxides from our power plants. In fact, Ohio's coal-fired power plant fleet is currently one of the most efficient in the country because they have installed highly effective pollution controls.

Finally, I am concerned about the significant legal uncertainty surrounding this plan, especially in light of the recent U.S. Supreme Court decision remanding the U.S. Environmental Protection Agency's Mercury and Air Toxic Standards to the D.C. Circuit court for further consideration. For these reasons and because of the irreversible

impacts if implemented, I am asking you to suspend implementation of the final rule until all legal appeals are resolved.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "John R. Kasich", with a stylized flourish at the end.

John R. Kasich
Governor, State of Ohio

Executive Summary

The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States

Review of RGGI's Second Three-Year Compliance
Period (2012-2014)

**Paul J. Hibbard
Andrea M. Okie
Susan F. Tierney
Pavel G. Darling**

July 14, 2015

Acknowledgments

This is a report on the economic impacts of RGGI program implementation, primarily covering the second three-year period of the program (2012-2014, known as the second Compliance Period). This Report supplements a previous study completed by Analysis Group in November 2011, on RGGI's first three-year Compliance Period (2009-2011). The analytic method and structure of this Report were modeled closely on the prior report in order to ensure methodological consistency and provide continuity in focus, content and the consideration of lessons learned. Where relevant in this Report, we include data, information, and observations to summarize developments and outcomes in both Compliance Periods One and Two, covering the first six years of RGGI (2009-2014). The Report was completed by Analysis Group with funding from several foundations:

Barr Foundation

Energy Foundation

The Thomas W. Haas Foundation at the NH Charitable Foundation

Merck Family Fund

Additional thanks go to the following individuals and foundations as part of the Maine Environmental Funders Network: Sandy Buck, Fritz and Susan Onion, Seal Bay Fund, anonymous, Anna Marie and John Thron, Peter Lamb, and the Orchard Foundation. The authors wish to thank the foundations for their support. We also thank Laurie Burt, of Laurie Burt, LLC, for her input and assistance throughout the project. We note our appreciation to advisory group members who reviewed and provided helpful comments on earlier drafts of the Report:

Michael J. Bradley, Chris Van Atten and Carrie Jenks, M.J. Bradley & Associates

Jennifer Macedonia, Bipartisan Policy Center and Principal, JLM Environmental Consulting

Rich Sedano, Principal and US Programs Director, Regulatory Assistance Project

The report, however, reflects the analysis and judgment of the authors only, and does not necessarily reflect the views of the foundations, Ms. Burt, or any reviewer. Finally, the authors recognize and thank their colleagues at Analysis Group (Ellery Berk, Katie Franklin, Dana Niu, Lucy Wagner, and Charles Wu) for significant analytic support throughout the project.

About Analysis Group

Analysis Group provides economic, financial, and business strategy consulting to leading law firms, corporations, and government agencies. The firm has more than 600 professionals, with offices in Boston, Chicago, Dallas, Denver, Los Angeles, Menlo Park, New York, San Francisco, Washington, D.C., Montreal, and Beijing.

Analysis Group's energy and environment practice area is distinguished by expertise in economics, finance, market modeling and analysis, regulatory issues, and public policy, as well as significant experience in environmental economics and energy infrastructure development. The practice has worked for a wide variety of clients including: energy producers, suppliers and consumers; utilities; regulatory commissions and other public agencies; tribal governments; power system operators; foundations; financial institutions; start-up companies, and others.

1. EXECUTIVE SUMMARY

Overview and Context

In 2009, ten Northeastern and Mid-Atlantic states began the Regional Greenhouse Gas Initiative (known as “RGGI”), the country’s first market-based program to reduce emissions of carbon dioxide (“CO₂”) from existing and new power plants.¹ Understanding the program’s performance and outcomes is important given that RGGI states account for one-sixth of the population in the US and one-fifth of the nation’s gross domestic product. Through their development and implementation of the RGGI program, these states have gained first-mover policy experience and have collaborated to form a multi-state emission-control policy that has reduced CO₂ emissions and operated seamlessly with well-functioning and reliable electricity markets. Insights and observations gleaned from an analysis of the program’s performance will be valuable in evaluating past policy decisions and future policy recommendations, and may be relevant to other states and regions as they develop their own plans to reduce CO₂ emissions in response to the Environmental Protection Agency’s (“EPA’s”) proposed Clean Power Plan.

This Report analyzes the economic impacts of RGGI’s most recent three years, covering the years 2012 through 2014. This analysis follows on our prior November 2011 Report (hereafter “AG 2011 Report”) that assessed the economic impacts of RGGI’s first three years (2009-2011).² Since the time of our last economic review, the electric industry has experienced changes in power plant economics, emission-control requirements, and wholesale market structures in the RGGI region. In addition, the RGGI states completed a comprehensive program review during 2012, and modified elements of the program including, most importantly, adopting a significantly lower overall cap on CO₂ emissions in the RGGI region.

In light of all of these changes, we not only examine the program’s performance in the 2012-2014 period, but we also review whether and to what extent the lessons learned from our prior assessment should be altered to reflect the economic realities of the three most-recent years. For this Report, we apply the same modeling approach as in the AG 2011 Report, but focus our analysis squarely on the economic impacts of the past three years.

In this report, Analysis Group has tracked the path of RGGI-related dollars as they leave the pockets of competitive-power generators who buy CO₂ allowances to demonstrate compliance, show up in electricity prices and customer bills, make their way into state accounts, and then roll out into the economy through various pathways. Our analysis is unique in this way – it focuses on the actual observable flow of payments and economic activity: known CO₂ allowance prices; observable CO₂

¹ The ten states are Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. New Jersey participated in the first three years of the RGGI program, withdrawing its participation at the end of 2011.

² Paul J. Hibbard, Susan E. Tierney, Andrea M. Okie, and Pavel G. Darling, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States*, November 2011. The analytic method and structure of this Report were modeled closely on the prior report, and carry forward observations from RGGI’s first three years (to the extent still relevant), in order to ensure methodological consistency and provide continuity in focus, content and the consideration of lessons learned.

auction results; dollars distributed from the auction to the RGGI states; actual state-government decisions about how to spend the allowance proceeds; measurable reductions in energy use from energy efficiency programs funded by RGGI dollars; traceable impacts of such expenditures on prices within the power sector; and concrete value added to the economy. By carefully examining the RGGI states' implementation of the program to date, based on real data, we hope to provide a solid foundation for observations that can be used by others in the design of CO₂ control programs going forward.

This review is timely for several reasons. First, as the RGGI states look forward to continued program administration in upcoming years, and to possible adoption of RGGI as the core of these states' plans to meet EPA's Clean Power Plan compliance requirements, they may benefit from more recent analysis of whether, and to what extent, past program and industry changes have affected the impact of power-sector carbon-control programs on the economies of the states in the Northeast. Such an analysis takes into account how changes in program design and the states' allocation of the proceeds of CO₂-allowance auctions has affected program pricing and the mix of economic costs and benefits.

Perhaps more importantly, the lessons learned from the RGGI program's implementation and impacts have potential usefulness beyond the RGGI states. With the issuance of EPA's proposed Clean Power Plan in June 2014 (and anticipating release of its final rule in mid-late summer 2015), states across the country have begun to consider compliance alternatives. Over the next several years, states will have to decide how to approach their Clean Power Plan compliance, including: what control measures and approaches to adopt; whether to select rate-based or mass-based compliance mechanisms;³ whether to allow averaging or bubbling of emissions within states; whether to go it alone or enter into compliance agreements with other states; whether to join an existing (or create a new) regional CO₂ mass-based market trading system, like RGGI; and whether to opt for the EPA to issue a federal implementation plan, rather than develop a state plan. In this context, having historical real-world information on the economics and program-design features of an existing CO₂ compliance program may be a valuable input into state decision-making. Six years of successful administration of RGGI provides a wealth of data and insights into key decisional factors for states around prospects for collaboration, joint governance and administration, program design and evolution, electricity price changes, and impacts on state and regional economies.

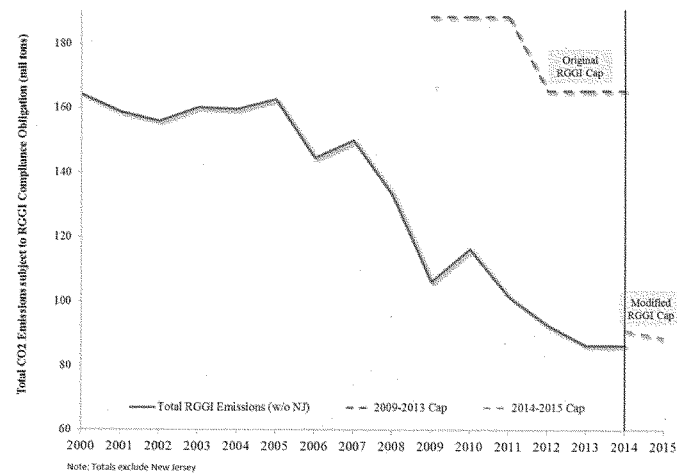
RGGI has now been operating for over six years. In every year, the emission allowances – or rights to emit CO₂ – have been almost entirely dispersed into the market through coordinated (centralized) regional auctions. Owners of fossil-fueled power plants have spent nearly \$2 billion to buy CO₂ allowances over the six years, and include the cost of allowances in their offer prices in wholesale electricity markets in New England, New York, and parts of the PJM region. The grid operators in these regions take these offer prices – including allowance costs – into account as they dispatch the

³ "Mass-based" is the term used by EPA in its proposed rule to describe a compliance option whereby states convert EPA's rate-based requirement (expressed in terms of a maximum rate of CO₂ emissions in pounds per megawatt-hour ("MWh") of electrical output (i.e., lbs/MWh)) into an equivalent total tonnage limit of CO₂ emissions from power plants across the state during a particular time period (i.e., "cap" on total emissions in the state from affected sources). The terms "mass-based" and "cap" refer to similar emission control program designs, and are both used throughout this document, depending on context.

plants on the system. As a result, consumers now pay electricity rates that reflect a price on CO₂ emissions without grid operators superimposing any other dispatch rule to account for emissions.

Throughout the RGGI program's implementation, power system reliability has been maintained and CO₂ emissions from power generation have decreased, affected by RGGI's original design, subsequent alteration of the RGGI cap, and broader economic and industry factors.⁴ As shown in Figure ES-1, CO₂ emissions (shown through 2014) have declined throughout the RGGI program life. Figure ES-2 provides additional information about cap levels and events during the first years of the RGGI program.

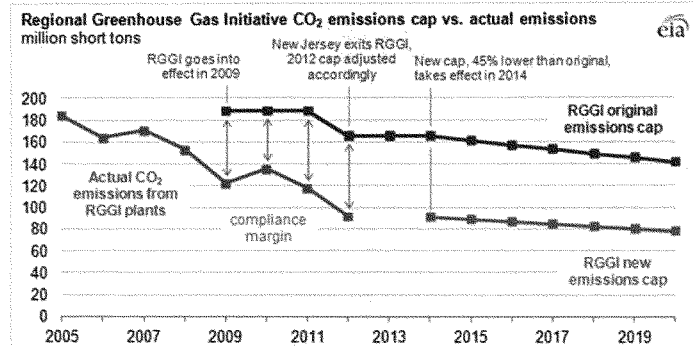
Figure ES-1
Actual CO₂ Emissions in the RGGI States, Relative to the Emissions Caps in Different Periods



Source: RGGI Inc.

⁴ RGGI, Inc. has reported that electric generation from RGGI-affected electric generation sources decreased by 18.8 million MWh, or 10.6 percent on average between 2010 and 2012 (compared to the average generation between 2006 and 2008). Yet during that same time period CO₂ emissions from RGGI electric generation sources decreased by 35.1 million short tons, or 25.4 percent. "CO₂ Emissions from Electricity Generation and Imports in the Regional Greenhouse Gas Initiative: 2012 Monitoring Report," RGGI, Inc., August 11, 2014.

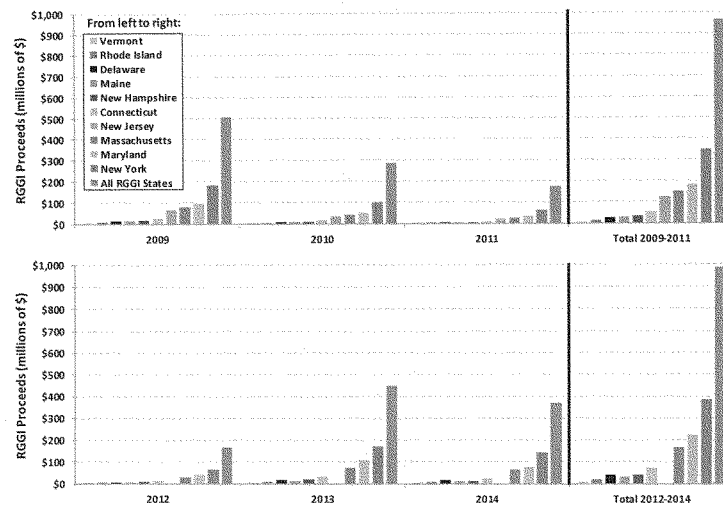
Figure ES-2
RGGI CO₂ Emissions Caps, Actual Emissions, and Other Events Since 2005



Since 2009, the RGGI states have received and disbursed virtually all of nearly \$2 billion in proceeds from CO₂-allowance auctions back into the economy in various ways, including on: energy efficiency measures; community-based renewable power projects; credits on customers' bills; assistance to low-income customers to help pay their electricity bills; greenhouse-gas-reduction measures; and education and job training programs. Figure ES-3 shows RGGI proceeds by state and region over the first two compliance periods.

During the 2012-2014 period, how has the RGGI program affected electricity markets, power producers' costs, electricity prices, and consumers' electricity bills? We examined this question in our 2011 AG Report, and we ask this same question again, along with others: What happened to the roughly \$1 billion in proceeds collected over the 2012-2014 period from the sale of CO₂ allowances? Has the program continued to produce net economic benefits to these states in the second three-year period, or otherwise helped them pursue their goals for reliable electric supply and CO₂-emissions reductions? What has been learned to date? Finally, in this Report we consider the implications of RGGI for states as they develop Clean Power Plan compliance approaches.

Figure ES-3
RGGI Allowance Proceeds by State



Source: RGGI Inc.
 Notes: Figures include Auctions 1-26 and direct sales proceeds for New Jersey (2009) and Connecticut (2009/2010).
 Auction proceeds from Auctions 1 and 2 are reflected in the 2009 values.
 New Jersey does not have auction proceeds after Compliance Period 1.

Results

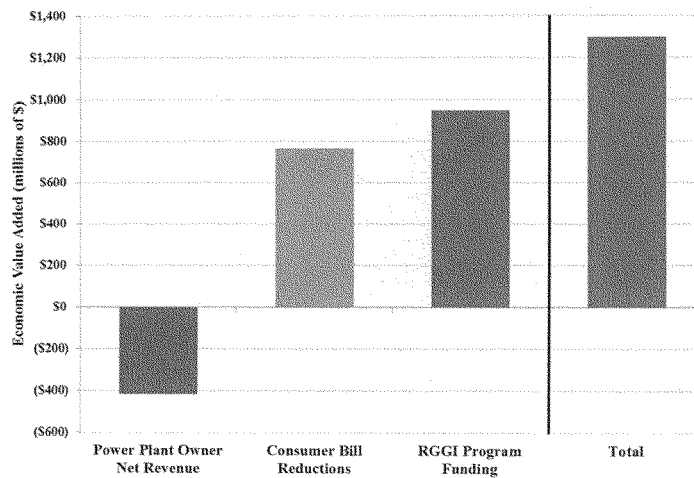
Over the last three years (2012-2014), the RGGI program led to \$1.3 billion (net present value) of economic value to the nine-state region.

Similar to our findings with respect to the first three years of the RGGI program, its implementation in the second three-year period generates \$1.3 billion in net economic benefits across the region.⁵ The region's economy – and each state's as well – benefits from the expenditures of RGGI auction proceeds on various programs, with benefits flowing to consumers and the broader economy. When spread across the region's population, these economic impacts amount to over \$31 in value added per capita in the region, on average. Figure ES-4 shows the net economic value broken out by the

⁵ All results for Compliance Period 2 are reported in 2015 dollars. Results are reported using a 3 percent "public" discount rate. Using instead a "private" discount rate of 7 percent, economic benefits still total almost \$900 million. See the Appendices for a discussion of public and private discount rates, and results calculated using both discount rates.

macroeconomic effects of RGGI on consumers and power plant owners, as well as effects that flow from direct spending of RGGI auction revenues.

Figure ES-4
Net Economic Impact to States in the RGGI Region (2015\$)



Notes: Figures represent dollars discounted to 2015 using a 3% public discount rate.

This recent positive economic outcome from the RGGI program results in large part from the states' decision to sell CO₂ allowances via a centralized auction and then use the proceeds from the auction in various ways that address state policy objectives, primarily by returning funds to electric ratepayers and funding local investment in energy efficiency ("EE") and renewable energy ("RE") resources. During the 2012-2014 period, the states received, programmed, and disbursed virtually all the \$1.0 billion in allowance proceeds back into the economy (shown in Figure ES-3). The money has been spent on energy efficiency measures, community-based renewable power projects, assistance to low-income customers to help pay their electricity bills, greenhouse gas reduction measures, and education and job training programs. The local investment keeps more of the RGGI states' energy dollars inside their region, reducing the amounts that leave the region to pay for fossil fuel production outside the RGGI states.

These economic benefits reflect the complex ways that RGGI dollars interact with local economies.

The states' use of RGGI auction proceeds on energy-efficiency programs, for example, leads to more purchases of goods and services in the economy (e.g., engineering services for energy audits, more

sales of energy efficiency equipment, labor for installing solar panels, dollars spent to train those installers and educators, and so forth). Together, these dollar flows have direct and indirect multiplier effects locally and regionally.

The size of RGGI's positive economic benefits varies by state and region, in large part because the RGGI states spent their RGGI auction proceeds differently.⁶ Different expenditures have different direct and indirect effects in their economies and different impacts on their electric systems. For example, a state's use of RGGI dollars to pay for energy efficiency programs that reduce energy consumption in the electric sector, and to invest in renewable projects that have low operating cost, both served to lower electricity prices in wholesale power markets (compared to a 'no-RGGI' scenario). This mitigated the early-years' cost impact for electricity consumers by turning the RGGI program into a down payment on lower overall bills for electricity in the longer-term.

Local reinvestment of RGGI dollars in energy efficiency and renewable energy programs is offsetting the impact of increased electricity prices resulting from the cost of RGGI allowances.

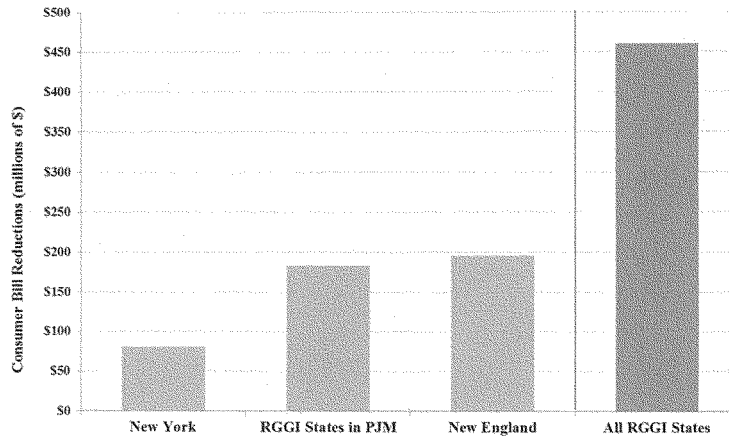
RGGI has also led to changes in consumers' overall expenditures on electricity: On the one hand, the inclusion of the cost of CO₂ allowances in wholesale prices increased retail electricity prices in the RGGI region throughout 2012-2014. But the near-term price impacts are more than offset during these years and beyond, because these states invested a substantial amount of the RGGI auction proceeds in energy-efficiency programs that reduce overall electricity consumption, and in renewable energy programs that displace higher-priced electricity generation resources. In the end, consumers gain because their overall electricity bills go down as a result of state RGGI allowance revenue investments, primarily in energy efficiency but also renewable energy-focused programs.

Energy consumers overall – households, businesses, government users, and others – have enjoyed a net gain of \$460 million, as their overall energy bills drop over time.

The net positive benefits to consumers are spread across residential consumers and commercial and industrial customers. Consumers of electricity save \$341 million, and natural gas and heating oil save \$118 million. Figure ES-5 shows the net bill reductions to consumers in each of the RGGI wholesale market regions.

⁶ Overall, the distribution of spending across the states was as follows: 59 percent on energy efficiency; 15 percent on renewable energy projects; 13 percent on bill-payment assistance to energy consumers; 12 percent on other greenhouse gas programs and program administration; and 1 percent on clean technology research and development. Individual state expenditures ranged significantly across these categories.

Figure ES-5
Net Bill Reductions to Consumers (2015\$)

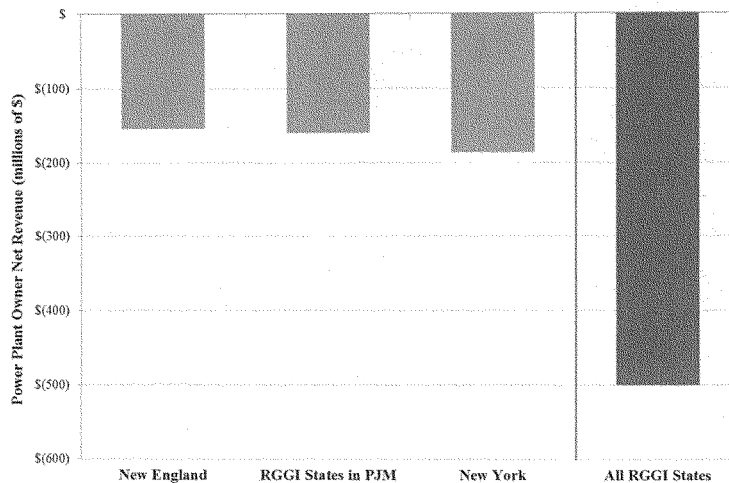


Notes: Figures include PROMOD outputs, non-electric benefit calculations, capacity market gain calculations, and direct bill assistance savings.
Figures represent dollars discounted to 2015 using a 3% public discount rate.

The power system experiences changes under RGGI: The order of power-plant dispatch changes somewhat; power plant owners recover the costs of CO₂ in the short run but experience lower output (and lower revenues) in the long run; and plants with lower CO₂ emissions have a competitive advantage.

Including a price on carbon emissions in the dispatch decisions in the region shifts output to lower-carbon-emitting sources of power. Although RGGI requires power plant owners to purchase CO₂ allowances, power plant owners as a group recover all of their early expenditures through the increase in electricity prices during the 2012–2014 period. In the near term, while all owners of emitting resources recover all of their costs to operate – including the cost of CO₂ allowances – the net effect of the program can reduce profits for owners of plants with relatively high carbon emissions (e.g., coal-fired power plants). On the other hand, owners of zero-carbon generating sources (e.g., nuclear, wind, solar, hydro) get the benefit of being paid higher market prices that reflect CO₂ allowance costs, without having to buy allowances. In the long run, however, RGGI-driven energy efficiency leads to lower demand for output from power plants as a whole, which ends up eroding power plant owners' electric market revenues. On an NPV basis, total actual and anticipated revenues to the power-generation sector drop by roughly \$500 million through 2025. Figure ES-6 shows the net revenue impact on power plant owners. Among the power plant owners, RGGI has afforded a competitive advantage to power plants with lower CO₂ emissions in every year.

Figure ES-6
Net Revenue Change for Power Plant Owners (2015\$)



Notes: Figures include PROMOD outputs, allowance true-up calculations and capacity market loss calculations. Figures represent dollars discounted to 2015 using a 3% discount rate.

Compared to RGGI's first three years (2009-2011), the total amount of emissions allowed in the region has been lowered, and with it, economic effects of RGGI have shifted.

The RGGI states decided in 2012 to lower the overall amount of CO₂ emissions allowed to be emitted from power plants in the region. (See Figure ES-2.) This tended to increase the price of CO₂ allowances, and in turn increase clearing prices in the region. With fewer CO₂ allowances to sell, however, the auction proceeds have also changed, with varying impacts on revenues available to states. These trends may continue as the cap continues to decline over time.

Insights and Observations

There are a number of observations that flow from the results described above, and others described in more detail in this Report. Some are important for providing the RGGI states with information about how the policy is performing relative to its original goals. The observations are also relevant in the context of these states' and other states' consideration of how to design their State Plans to comply with EPA's proposed Clean Power Plan. In this section we summarize our observations based on the power sector and economic analyses described in this Report.

Relative to the first three years of the RGGI program, the RGGI states' experience during 2012-2014 differed along a number of dimensions.

- The RGGI states benefitted from having had three years of prior program administration experience, and throughout 2012 undertook a top-to-bottom review of RGGI, with major changes implemented – including a lowering of the overall emissions cap;
- Many states adjusted how they spent RGGI auction proceeds over time, shifting the use of allowance revenues to reflect different program and state objectives;
- New Jersey exited the program at the end of 2011, requiring an adjustment to the overall emissions cap to remove that state's emissions' allocation;
- Fossil fuel prices (both relative and absolute) have changed significantly since the start of the program;
- Energy efficiency and grid-connected/distributed renewable energy resources have continued to grow at a rapid pace in many of the RGGI states, with increasing influence on power sector demand and dispatch; and
- Accelerated retirement of the regions' legacy generating units has continued, with more to come.

Each of these factors has had the potential to strongly influence the economic impacts of RGGI. For example, the lowering of the overall cap both increases allowance prices (and thus the marginal costs of affected generating units) and decreases allowance quantities, with varying impacts on revenues available to states. In addition, relatively low natural gas prices and increased energy efficiency and renewable energy in 2012-2014 relative to 2009-2011 affected the price of the marginal generator in these wholesale power markets and led to lower power prices. This, in turn, tended to dampen electricity-cost benefits of RGGI-funded programs (like energy efficiency and renewable energy). The combined effect was that initial price impacts were higher, and subsequent benefits of RGGI programs lower, than we found for RGGI's first three years.

Implementation of RGGI during the past three years continues to generate substantial economic benefits for the RGGI states while continuing to reduce emissions of CO₂.

Economic value added

Our analysis of RGGI impacts over the past three years took into consideration the program's effects on power system dispatch, costs to consumers, revenues to electric generators, and overall state economic performance. We found lower costs to electric consumers throughout the region, decreases in revenues to the owners of certain power plants, and positive economic impacts across all states, totaling approximately \$1.3 billion in economic value added (in 2015 dollars) as a result of RGGI's second three years (2012-2014). This is on top of what we found for the first three years (2009-2011) of the program: \$1.6 billion of economic value added (in 2011 dollars). Thus, considering results found in both our studies, the first six years of RGGI program implementation has continuously generated significant economic value for the RGGI states, while achieving the region's collective objectives in terms of reducing emissions of CO₂.

Jobs

Taking into account consumer gains, lower producer revenues, and net positive macroeconomic impacts, RGGI led to overall job increases amounting to thousands of new jobs over time. RGGI job impacts may in some cases be permanent; others may be part-time or temporary. But according to

our analysis, the net effect is that the second three years of RGGI leads to nearly 14,200 new job years, with each of the nine states showing net job additions. This is on top of what we found for the first three years (2009-2011) of the program: 16,000 job-years. Jobs related to RGGI activities are located around the economy, with examples including engineers who perform efficiency audits; workers who install energy efficiency measures in commercial buildings; or staff performing teacher training on energy issues.

Fossil fuel production and imports

Over the past three years, RGGI helped lower the total dollars these states sent outside their region in the form of payments for fossil fuels by over \$1.27 billion. Most of the RGGI states' electricity comes from fossil fuels, even though these states produce virtually no coal, natural gas, or oil locally. Since the RGGI program lowered states total fossil-fired power production and lowered use of natural gas and oil for heating, RGGI reduced the total dollars sent out of state for these energy resources.

Continuation of program benefits from the first three years

Our findings on economic impacts of the second three years of the RGGI Program are consistent with previous findings and observations with respect to the first three years. As noted earlier, analysis following RGGI's first three years delivered net economic benefits to all of the states participating in the program, including growth in economic output, increased jobs, reinvestment of energy dollars in local/state economic activity, long-run electricity cost reductions, and successful emission reductions. Further, states found ways to reinvest auction proceeds through programs that distributed benefits broadly, across all classes of customers, including targeted investment in EE programs for low-income customers. States have demonstrated the ability to not only use allowance proceeds in ways that advance state policy objectives, but to do so with an eye towards fair distribution of reinvestment benefits across all customers.

The RGGI program's first six years (2009-2014) provides empirical evidence about carbon-control programs for the power sector that are useful in the current context.

Review of the nation's first multi-state, mass-based CO₂ emission control program provides information for states considering Clean Power Plan compliance alternatives.

EPA's Clean Power Plan has focused industry and state policymaker attention on the various alternatives for reducing emissions of CO₂ from the electricity sector, in part because EPA's proposal is structured to provide a high degree of flexibility and choice for states, including the possibility of (and incentives for) multi-state compliance planning, and the use of a mass-based program with tradable allowances.⁷ Lessons learned in the six-plus years of RGGI implementation thus directly

⁷ A recent study performed by researchers at the University of Texas at Austin summarized the results of a survey of electric companies and state officials with respect to several key issues, including attitudes about mass-based versus rate-based program designs: "The overwhelming majority of survey respondents favored the development of state compliance plans rather than federally-developed plans. There was broad support, among survey respondents, for mass-based trading programs. ... Support was found in both Democratic- and Republican-controlled states but was higher in the former than the latter. ... Most survey respondents favored market-based compliance options. 68 percent of respondents indicated that they preferred mass-based trading over other market-based options. 11 percent of respondents listed rate-based trading as their preferred option. Almost two-thirds of survey respondents favored adoption of mass-based emissions targets, arguing that

relate to fundamental state economic, energy, and environmental policy questions tied to Clean Power Plan compliance choices. The deep experience of the RGGI region affords highly relevant data points for states that now must grapple for the first time with the development of state plans to reduce CO₂.

The experience of the RGGI states over the past ten-plus years, from conception of a regional market-based CO₂ control program, through six years of program administration, provides a wealth of data and lessons. Key themes that flow from a programmatic and quantitative economic analysis of RGGI include: the feasibility and value of multi-state approaches to controlling CO₂; the ability of states to work cooperatively and effectively together; and the ability of market-based allowance trading programs with state-driven auctions and local reinvestment of auction proceeds to help states meet EPA's Clean Power Plan requirements while generating positive economic benefits.

The positive impacts of RGGI on state economies are additive to the purpose and expected benefits of the program.

RGGI is not and was never meant to be an economic-development program. The purpose of the RGGI program is to reduce emissions of CO₂ from power plants in order to help mitigate the economic, social, and environmental risks of climate change, and to avoid the potentially substantial damages to human health and society that are expected to come with increasing concentrations of greenhouse gases in the atmosphere. And as shown in Figure ES1, the RGGI program has contributed to significant reductions in emissions of CO₂ across the RGGI region. In our analysis, however, we do not attempt to quantify the potential long-term benefits of reducing the risks of climate change. The focus of our analysis is specific and narrow – we review only the direct impacts of program implementation costs and state use of allowance revenues on state economies, in order to test the idea that controlling emissions of CO₂ will somehow lead to negative consequences from the perspectives of state economic growth and jobs. Our results – which instead reveal positive economic impacts – should be viewed as additive to whatever additional economic, social and/or environmental benefits flow from reducing climate change impacts.

The RGGI model has successfully achieved CO₂ reductions through a cooperative framework that preserves state authority.

The states that comprise the RGGI region are highly diverse in many ways – the political setting and state policy objectives vary widely across the states, and have also changed significantly *within* states over the timeframe of the first six years; state electricity generating portfolios differ substantially in size, technologies, fuel mix, and age; state industrial and commercial profiles and the bases of economic activity cover a wide range of technologies, products and activities across the RGGI region; the degree of development interest in traditional power generation sources, renewables, and energy

they are easier to implement than the rate-based targets proposed by EPA. The bulk of survey respondents supported interstate cooperation on the Clean Power Plan, with 90 percent arguing that states should develop multi-state plans or single-state plans that preserve the option to trade across state lines. Melinda Taylor and Romany Webb, "EPA's Clean Power Plan: Implementation Options – Survey Results: Insights from Industry Experts and State Officials on Implementation of EPA's Clean Power Plan," Kay Bailey Hutchison Center for Energy, Law & Business, University of Texas at Austin, June 2015. http://kbhenergycenter.utexas.edu/files/2015/06/Final_Report-EPA-Clean-Power-Plan-Implementation-Options_6.23.2015.pdf.

efficiency differs; and states all have unique legal and regulatory structures that oversee energy, utility, and environmental policies.

Despite these differences, the RGGI states have successfully navigated the complications that can arise from efforts to coordinate regulatory and policy objectives across state lines. RGGI's experience confirms the possibility that states can work together, particularly when doing so is likely to lower compliance costs and generate economic benefits. Strong evidence of effective cooperation among politically and economically diverse states is found in RGGI states' ability to: successfully complete the nation's first multi-state CO₂ program consistent with sound economic principles; complete the stakeholder, legislative, and regulatory steps necessary over just several years; smoothly administer the program and integrate it with wholesale electricity markets; complete a top-to-bottom programmatic review mid-stream, complete with major changes, in just a year; and proactively work together on all design and administration issues, including potential adaptation of the program for compliance with the Clean Power Plan.

Mandatory, market-based carbon-control mechanisms are functioning properly in wholesale markets and have not affected power system reliability.

Based on six years of experience from the nation's first multi-state, mandatory carbon control program, market-based programs can provide positive economic impacts and meet emission objectives in a manner well-suited for the operation of power systems. The implementation of RGGI over six years has not adversely affected power system reliability in New England, New York, or PJM. The pricing of carbon in Northeast and Mid-Atlantic electricity markets has been seamless from an operational point of view and successful from the perspective of efficient pricing of emission control in regional markets.

The design of the CO₂ market in the RGGI states allows for the creative use of public funds, supporting diverse state policy and economic outcomes.

The joint decision by the RGGI states to make their CO₂ allowances available to the market through a unified auction has generated substantial revenues for public use. This approach transferred emissions rights from the public sector to the private sector at a monetary cost (rather than transferring them for free). Had these allowances been given away for free, the states would not have had the benefit of the auction proceeds, and instead would have transferred that economic value to owners of power plants (which in the RGGI region are merchant generators, not owned by electric distribution utilities). The states' use of allowance proceeds not only provides economic benefits, but also has helped them meet a wide variety of social, fiscal, and environmental policy goals, such as addressing state and municipal budget challenges, assisting low-income customers, achieving advanced energy policy goals, and restoring wetlands, among other things.

How allowance proceeds are used affects their economic impacts: use of auction proceeds to invest in energy efficiency produces the biggest bang per buck, in terms of net positive benefits to consumers and to the economy.

The RGGI Memorandum of Understanding ("MOU") fully anticipates – if not encourages – states to place different weights on economic, environmental, social, energy security, and other goals as they implement the program. But from a strictly economic perspective, some uses of proceeds clearly deliver economic returns more readily and substantially than others. For example, RGGI investment in energy efficiency leads to lower regional electrical demand, lower power prices, and lower

consumer payments for electricity. This benefits all consumers through downward pressure on wholesale prices, yet it particularly benefits those consumers who actually take advantage of such programs, implement energy efficiency measures, and lower both their overall energy use and monthly energy bills. These savings stay in the pocket of electricity users. But positive macroeconomic impacts exist as well: the lower energy costs flow through the economy as collateral reductions in natural gas and oil consumption in buildings and increased consumer disposable income (from fewer dollars spent on energy bills), lower payments to out-of-state energy suppliers, and increased local spending or savings. Consequently, there are multiple ways that investments in energy efficiency lead to positive economic impacts, and this reinvestment stands out as the most economically-beneficial use of emission allowance revenues. Other uses also provide macroeconomic benefits, even if they do not show up in consumers' pockets in the form of lower energy bills.

DOCUMENTS SUBMITTED BY REPRESENTATIVE PALMER

Black Chamber of Commerce: EPA Clean Air Plan Will Increase Black Poverty 23%, Strip 7,000,000 Black Jobs

(CNSNews.com) - A study commissioned by the National Black Chamber of Commerce, which represents 2.1 million black-owned businesses in the United States, found that the Environmental Protection Agency's (EPA) Clean Power Plan would increase black poverty by 23 percent and cause the loss of 7 million jobs for black Americans by 2035.

The study also found that the EPA's plan would increase Hispanic poverty by 26 percent and cause the loss of 12 million jobs for Hispanic Americans by 2035.

The EPA proposed the Clean Power Plan [1] on June 2, 2014 to cut carbon emissions from power plants. The National Black Chamber of Commerce commissioned the study to evaluate the potential economic and employment impacts of the plan on minority groups.

National Black Chamber of Commerce President Harry Alford explained the results of the report [2], "Potential Impact of Proposed EPA Regulations on Low Income Groups and Minorities" at the Senate Environment and Public Works Committee hearing on Tuesday.

"The study finds that the Clean Power Plan will inflict severe and disproportionate economic burdens on poor families, especially minorities," said Alford in his prepared statement [3]. "The EPA's proposed regulation for GHG [greenhouse gas] emissions from existing power plants is a slap in the face to poor and minority families.

"These communities already suffer from higher unemployment and poverty rates compared to the rest of the country, yet the EPA's regressive energy tax threatens to push minorities and low-income Americans even further into poverty," Alford added.

"According to a recent study commissioned by the National Black Chamber of Commerce," Alford said, "the Clean Power Plan would: increase Black poverty by 23 percent and Hispanic poverty by 26 percent; result in cumulative job losses of 7 million for Blacks and nearly 12 million for Hispanics in 2035; and decrease Black and Hispanic median household income by \$455 and \$515 respectively, in 2035."

Sen. Tom Carper (D-Del.) rebutted this view, saying that states who have taken action on climate change have seen their economies grow.

"Many states, such as New York and Delaware, have already taken action to reduce the largest emitter of carbon pollution - power plant emissions," Carper said. "As we will hear today, the economies of these states continue to grow at a faster rate than the states that have yet to put climate regulations in place. However, we need all states to do their fair share to protect the air we breathe and stem the tide of climate change. The EPA's Clean Power Plan attempts to do just that."

Opponents of the plan like Sen. Shelley Moore Capito (R-W.Va.) say that the Clean Power Plan will raise electricity prices and hurt businesses in her state.

"I introduced ARENA [Affordable Reliable Electricity Now Act] and am holding this hearing today because of the devastating impact that EPA's proposed regulations will have on the families and businesses in my home state and across the nation," said [4] Capito. "I am not exaggerating when I say almost every day back home in West Virginia, there are new stories detailing plants closed, jobs lost, and price increases."

One of the businesses in Capito's home state, Ammar, Inc., a family-owned company that operates 19 Magic Mart stores in West Virginia, Virginia and Kentucky wrote Capito a letter about the EPA regulation.

"There was a time when your greatest obstacle was your competitor, but if you worked hard, took care of your customers and offered quality merchandise at a fair price, you could compete successfully," the letter stated. "Unfortunately, that is now not the case... The largest impediment we have to operating our business successfully is our own government, particularly the EPA. The rulings issued by the EPA have devastated our regional economy."

"Coal provided 96 percent of West Virginia's electricity last year. West Virginia has among the lowest electricity prices in the nation: last year, the average price was 27 percent below the national average," said Capito. "But that advantage will not survive this administration's policies. Studies have projected the Clean Power Plan will raise electricity prices in West Virginia by between 12 and 16 percent."

"Put simply, there is no way that this massive, largely EPA-driven reduction in coal fired electricity generation is going to impact only coal states. It's going to impact the majority of states, and the families and businesses within them. Often, the poorest and most vulnerable populations will bear the brunt of this increase," she said.

Source URL: <http://www.cnsnews.com/news/article/ali-meyer/black-chamber-commerce-epa-clean-air-plan-will-increase-black-poverty-23>

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Energy Bills Challenge America's Fixed-Income Seniors

Energy, like food and housing, is an indispensable necessity of life. Air conditioning, lighting, and heating are essential to American daily life, and are critical for the survival of elderly and infirm citizens. High electricity and other energy prices are disproportionately impacting America's senior citizens today. The United States has 27 million households aged 65 or more ("65+"), representing nearly one-quarter of the nation's 116 million households.

Future energy price increases, driven in large measure by petroleum supply and demand trends and by current and pending U.S. EPA regulations, are likely to outstrip real household incomes among the 63% of America's 65+ households with gross annual incomes less than \$50,000. EPA's newest proposal to regulate greenhouse gas emissions from existing power plants will further strain the budgets of low- and fixed-income seniors who are among the most vulnerable to electric rate and other energy price increases.

Overview

- ✓ The Census Bureau reports that the average pre-tax household income of 65+ households in America was \$54,522 in 2012, 23% below the average national household income of \$71,274.
- ✓ The median income of U.S. 65+ households in 2012 was \$33,848, meaning that one-half of senior households had gross 2012 pre-tax incomes below this level. Households with principal householders younger than 65 had 2012 gross median incomes of \$57,353, nearly 70% greater than 65+ households. U.S. Census Bureau, Statistics of Income, Poverty and Health Insurance in the U.S.: 2012 (2013).
- ✓ More than 40% of America's 65+ households had gross annual incomes below \$30,000 in 2012, with an average pre-tax household income of \$17,032, or \$1,419 per month.
- ✓ The average annual electric bill for 65+ households, \$1,164 in 2009, represented 61% of total residential energy bills.
- ✓ The average price of residential electricity per kilowatt-hour (kWh) has increased by 39% since 2003, well above the 29% increase in inflation as measured by the Consumer Price Index. This increase is due in part to higher fuel and capital costs and the costs of compliance with environmental regulations.
- ✓ The modest Cost of Living Adjustments (COLA) received by Social Security recipients, representing 29% of all America households in 2012, do not keep pace with inflation.
- ✓ Energy costs are adversely impacting lower-income seniors afflicted by health conditions, leading them to forego food for a day, reduce medical or dental care, and fail to pay utility bills (APPRISE, 2009).
- ✓ U.S. DOE's projection for Henry Hub wellhead natural gas prices - a key determinant of future electricity prices - calls for a 3.7% annual real increase from 2012 to 2040. These price increases do not account for the increase in natural gas demand expected to result from EPA's proposed Clean Power Plan ("CPP") for reducing CO2 emissions from existing power plants.
- ✓ Fossil-fueled electric utilities have reduced emissions of carbon dioxide by 12% since 2005, measured in pounds of CO2 per Megawatt-hour (MWh) of electric generation (EPA CAMD Data Base, 2014). EPA's proposed CPP rule does not give credit for these reductions. It requires states to achieve reductions in utility emissions ranging from 11% (North Dakota) to 72% (Washington) based on 2012 emission rates. The final emission target for each state is to be met by 2030, with reductions beginning in 2020.

- ✓ EPA's CPP will substantially increase electric prices for America's 65+ households. The proposed rule sets forth "building blocks" of options for reducing emissions, focused on decreasing the use of coal in favor of natural gas, while increasing energy efficiency and renewable energy resources.
- ✓ EPA's Regulatory Impact Analysis (RIA) for the CPP projects national costs of \$5.4 to \$7.4 billion annually in 2020. EPA's projections assume billions of dollars of offsetting annual savings from reductions of electric demand through widespread investments in energy efficiency measures.
- ✓ **EPA projects 5.9% to 6.5% average retail electric price increases for the proposed Clean Power rule in 2020, with increases as high as 10% to 12% in some regions** (CPP RIA Table 3-21). This projection is highly uncertain because it assumes that states will follow EPA's prescribed "building blocks" approach to emission reductions. If the flexibility measures in EPA's proposed rule prove unworkable, or are limited by judicial decisions, higher rate impacts could result.
- ✓ **EPA's projected national average 5.9% to 6.5% retail electric price increases due to EPA's Clean Power rule will follow a 3.1% average national price increase in 2015 for compliance with EPA's 2011 Mercury and Air Toxics Standards rule** (EPA MATS RIA, Table 3-12).
- ✓ **EPA's projected electric rate impacts are likely conservative. A March 2014 analysis by National Economic Research Associates of a CO2 reduction proposal similar to the EPA Clean Power rule estimated national average residential electricity price increases of 3.0% to 11.4% over 2018-2033, depending upon the degree of flexibility in implementation** (NERA/ACCCE, March 2014). These price increases are in addition to those expected in 2015-2017 due to the implementation of the EPA mercury rule.
- ✓ **A new NERA analysis of the proposed Clean Power Plan indicates potential delivered electric price increases averaging 12% to 17% over the period 2017 to 2031, depending upon the degree of implementation flexibility. Total consumer energy costs could rise by \$366 to \$479 billion in net present value** (NERA/ACCCE *et al.*, October 2014).
- ✓ **A July 2014 analysis by the Center for Strategic and International Studies (CSIS) and the Rhodium Group using EIA's NEMS energy model projects that national electric prices could increase by 5.4% to 9.9% due to the Clean Power rule** (CSIS at 28). These price increases also are in addition to the 3.1% increase for compliance with the EPA mercury rule.
- ✓ **The CPP will lead America to greater dependence on natural gas as a main source of electric generation.** CSIS forecasts that natural gas use could more than double as a percent of total electric generation, rising from 19% in 2010 to 43% in 2020 (CSIS at 17, national scenario without energy efficiency). The share of coal generation declines from 46% to 21% over this period due to higher demand for natural gas.
- ✓ **EPA projects that the Clean Power Plan will lead to further increases in delivered natural gas prices of 7.5% to 11.5% in 2020** (CPP RIA, June 2014). U.S. DOE projects that the price of natural gas delivered to electric utilities will increase at a compound annual rate of 3.1% above the rate of inflation between 2012 and 2040, the highest rate of real price increase for any delivered fuel in any sector of the economy (DOE Annual Energy Outlook 2014).
- ✓ **EPA's proposed Clean Power "building blocks" for state emission reductions contain unrealistic assumptions on the potential for large-scale renewable energy and energy efficiency development within the short timetable of the EPA rule.** Lower-income seniors are among those least likely to make major investments in new energy efficiency programs with long investment payback times.
- ✓ **The CPP will cause the retirement of 30 to 49 Gigawatts of coal generating capacity by 2020** (CPP RIA, Table 3-12). This is in addition to more than 50 Gigawatts of coal capacity expected to be retired over the next few years as a consequence of compliance with EPA's 2011 MATS rule, low natural gas prices, and other factors (DOE/EIA AEO 2014). Overall, the nation will lose 126 Gigawatts of coal generating capacity between 2010 and 2020 following implementation of the CPP (CPP RIA, Table 3-12 and DOE/EIA 2011 Annual Energy Review).

- ✓ **EPA projects that coal production for electric generation will decline from 844 million tons in the 2020 base case to 616 to 636 million tons under the CPP, a reduction of 25% to 27% (CPP RIA, Table 3-15).**
- ✓ Independent experts caution about near-term electric reliability issues in the Texas, Great Lakes, and Midwest regions, reflecting a growing imbalance of generating resources and demand. This imbalance, attributable to factors including the retirements of existing generating assets, is projected to expand by 2023 to the New York/New England, Rocky Mountain, Southwest, and Southeast regions.
- ✓ The expected retirement of an additional 30 to 49 Gigawatts of coal generating capacity due to EPA's Clean Power Plan will contribute further to inadequate reserve margins in several regions, particularly if EPA's ambitious energy efficiency goals are not met. **The additional baseload generation capacity projected to retire due to the Clean Power Plan would increase the risks of brownouts, load curtailments, and other power shortages in regions impacted by these retirements.**
- ✓ **There is growing state opposition to EPA's proposed Clean Power rule.** Some 20 state legislatures passed acts or resolutions prior to the rule's proposal urging EPA to adopt an "inside-the-fence" approach for measuring emission reduction potential at individual power plants. On August 25, 2014, the attorneys general of 13 states wrote to EPA calling for immediate withdrawal of the proposed rule on the grounds that EPA failed to disclose critical data underlying the rule's building block assumptions. Federal litigation by several state attorneys general and private parties is already underway seeking to bar EPA's use of Section 111(d) of the Clean Air Act for regulating emissions from existing sources that are subject to the agency's 2011 mercury rule.
- ✓ **A new ozone air quality standard could dramatically increase energy costs for all American consumers and industries.** EPA plans to revise the 2008 National Ambient Air Quality Standard for ozone, currently set at a level of 75 parts per billion (ppb), in late 2015. A July 2014 analysis by National Economic Research Associates of a potential new ozone standard set at a level of 60 ppb indicates that such a standard could impose \$348 billion in annual compliance costs across the nation. NERA projects that national average residential electricity prices would increase by 3.3% to 15%, while residential natural gas prices could rise by 7% to 32%. The upper end of these price increases reflects the potential that a new ozone standard could constrain future natural gas development, causing both electricity and natural gas prices to increase significantly. (NERA/NAM, July 2014, Figs. S-9, S-15).
- ✓ **The price of gasoline has increased by 55% since 2005, a rate nearly three times greater than the 19% increase in the Consumer Price Index.** The vast majority of seniors are drivers, representing an increasing share of total drivers on the road. U.S. Government survey data indicate that average vehicle miles per 65+ driver more than doubled between 1983 and 2009. With gasoline costs of some \$3.50 per gallon, senior households spend approximately \$1,500 annually per vehicle on gasoline.
- ✓ In 2012, 29% of U.S. households received Social Security benefits averaging \$16,977 per household (Bureau of the Census, 2014). The future stability of this income, however, cannot be assured due to the rapidly changing dynamics of the U.S. population, and the projected increase in Social Security recipients. As more members of the baby-boom generation retire, outlays will increase relative to the size of the economy, whereas tax revenues will remain at an almost constant share of the economy. As a result, the gap will grow larger in the 2020s and will exceed 30 percent of revenues by 2030 (Congressional Budget Office, 2013).
- ✓ CBO projects that under current law, the Disability Insurance trust fund will be exhausted in fiscal year 2017, and the Old Age and Survivors trust fund will be exhausted in 2033. If a trust fund's balance fell to zero and current revenues were insufficient to cover the benefits specified in law, the Social Security Administration would no longer have legal authority to pay full benefits when they were due (CBO, 2013).
- ✓ Rising real energy costs and Cost of Living Adjustments that do not keep pace with inflation mean that every marginal dollar spent for energy reduces disposable income for 65+ households, limiting funds available for other essentials like food, housing, and medical care.

Low- and fixed-income seniors are among the most vulnerable to electric rate and other energy price increases. Current and pending U.S. EPA regulations will increase the price of electricity in America at rates above the general rate of inflation. Just maintaining the energy budget status quo for America's 65+ fixed income population requires stable electricity and other energy prices that do not increase above the rate of inflation.

Demographic Facts

- ✓ In 2012, seniors 65 and older accounted for 23% of America's 116 million households.
- ✓ 29 percent of U.S. households, representing 34 million households, received Social Security benefits averaging \$16,977 in 2012.
- ✓ The average pre-tax household income of 65+ households in America was \$54,522 in 2012, 24% below the average U.S. household income of \$71,274.
- ✓ The median household income of 65+ seniors in 2012 was \$33,848, 41% less than the \$57,353 median income of younger households.
- ✓ Nearly two-thirds of America's 65+ households had gross incomes below \$50,000 in 2012, with an average pre-tax income of \$24,842 or \$2,070 per month before state and federal taxes.

As shown in the table below, 41 percent of America's 65+ households had gross annual incomes below \$30,000 in 2012, with an average pre-tax household income of \$17,032, or \$1,419 per month:

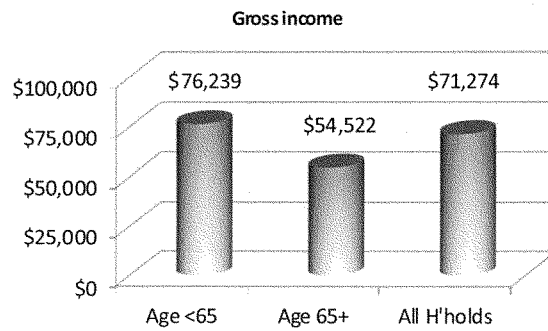
U.S. Household Income, 2012

Annual gross income	<\$30K	\$30-<\$50K	<\$50K	All households
All H/Hs (Mil.)	34.3	22.0	56.3	116.0
Pct. of H/Hs	30%	19%	49%	100%
Avg. gross income	\$16,235	\$39,763	\$25,419	\$71,274
65+ H/Hs (Mil)	11.0	5.8	16.8	26.5
Pct of 65+ H/Hs	41%	22%	63%	100%
Avg. 65+ gross income	\$17,032	\$39,546	\$24,842	\$54,522

Source: U.S. Bureau of the Census, American Community Survey (2014).

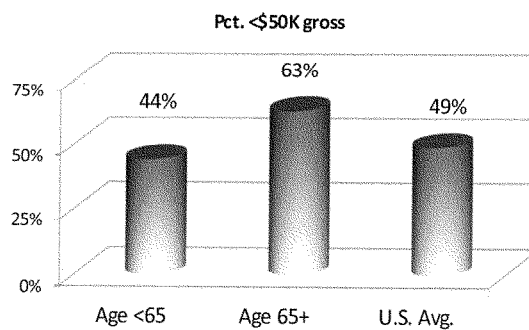
The charts below compare average gross household incomes in 2012 for U.S. households by age of principal householder. The gross incomes of households led by 65+ seniors were 28% or \$22,000 below those of households headed by younger persons. Seniors also are disproportionately represented among lower-income households with gross annual incomes less than \$50,000 and less than \$30,000:

Average U.S. gross household income by age of principal householder, 2012

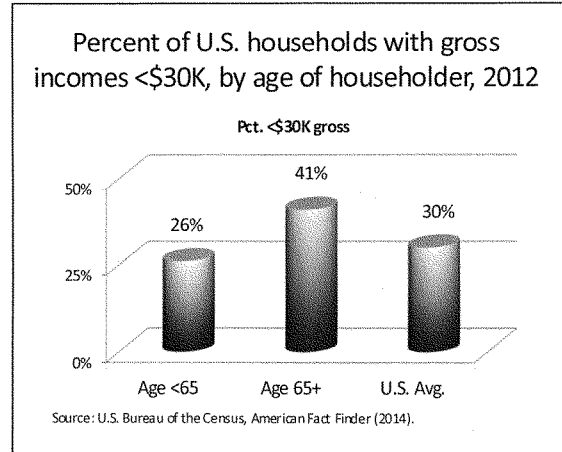


Source: U.S. Bureau of the Census, American Fact Finder (2014).

Percent of U.S. households with gross incomes <\$50K, by age of householder, 2012



Source: U.S. Bureau of the Census, American Fact Finder (2014).



The median income of U.S. 65+ households in 2012 was \$33,848, meaning that one-half of senior households had gross 2012 pre-tax incomes below this level. Households with principal householders younger than 65 had 2012 gross median incomes of \$57,353, nearly 70% greater than 65+ households. U.S. Census Bureau, Statistics of Income, Poverty and Health Insurance in the U.S.: 2012 (2013).

Energy Facts

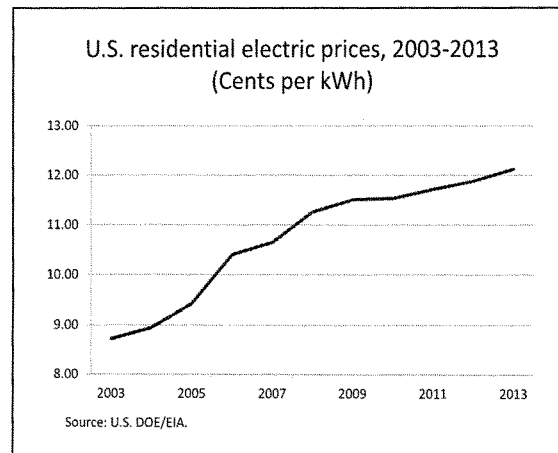
Electricity and motor gasoline are the principal energy expenditures for most 65+ households. Electricity accounts for two-thirds of average American household residential energy expenditures. Natural gas, propane, heating oil, and other fuels account for the remainder. For the nation's 27 million 65+ households, electricity represents 61% of total residential bills, as shown in the table below:

U.S. residential energy expenditures, 2009

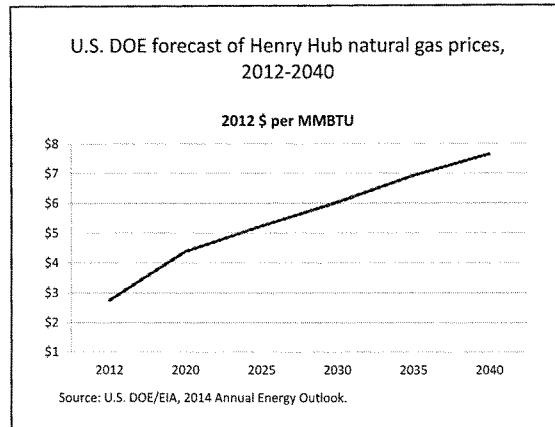
	Avg. energy expenditures	Electricity	N. Gas & other	Electricity pct. of total expends.
All H/Hs	\$2,024	\$1,340	\$684	66%
65+ H/Hs	\$1,909	\$1,164	\$745	61%

Source: U.S. DOE/EIA 2009 Residential Energy Consumption Survey (2012); Data for 65+ households provided by EIA.

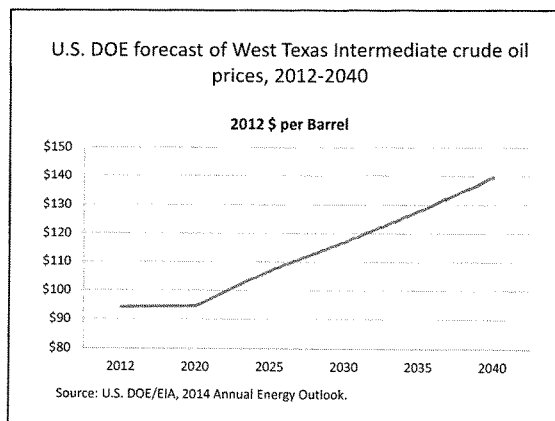
- ✓ The national average price of electricity per kilowatt-hour (kWh) has increased by 39% since 2003, substantially above the 29% increase in inflation as measured by the Consumer Price Index. This increase is due in part to higher fuel and capital costs, and the costs of compliance with environmental regulations. Recent trends in national residential electric prices are shown in the chart below.



- ✓ Electricity price increases moderated in 2011-12 due to short-term reductions of natural gas prices, a principal source of electric generation in many states. Recent reductions of natural gas prices are not expected to continue based on current Department of Energy forecasts.
- ✓ U.S. DOE projects that wellhead gas prices at the Henry Hub, a key determinant of future electricity prices, will increase in real terms by 90% from 2012 to 2025, from \$2.75 per MMBTU to \$5.23 per MMBTU. These price increases, shown in the chart below, do not account for the increase in natural gas demand likely to result from EPA's proposed regulations for reducing CO₂ emissions from existing power plants.
- ✓ EPA projects that natural gas demand initially will increase by 12% to 14% in 2020, and then decline over time due to the Clean Power Plan's energy efficiency goals for each state (EPA CPP RIA, Table 3-16). Analysts at the Center for Strategic and International Studies and the Rhodium Group report that natural gas demand for compliance with the CPP may be three times greater than EPA projects in the absence of aggressive energy efficiency programs (CSIS/Rhodium Group, 2014).



While natural gas prices are projected to increase at rates substantially above the rate of inflation, the Department of Energy projects a steady, but more moderate, 1.4% rate of real price increase in domestic oil. West Texas intermediate crude oil prices are a fundamental barometer of future energy prices in the economy:



Electricity costs strain elderly fixed-income household budgets

For America's 17 million senior households with pre-tax incomes below \$50,000 in 2012, and an average pre-tax income of \$24,842, electricity costs are burdening household budgets constrained by modest Social Security cost-of-living (COLA) increases. There were no COLA increases in 2010 or 2011, and the January 2014 increase of 1.5% does not keep pace with the overall Consumer Price Index. Since January 2010, the cumulative increase in COLAs was 6.9% versus a 9% increase in the CPI. (Bureau of Labor Statistics CPI Calculator and Social Security Administration, History of Automatic Cost of Living Adjustments).

- ✓ Projections of future residential electric price increases suggest that electric prices will increase at a rate well above the general rate of inflation in the economy, adversely impacting millions of 65+ households living on fixed sources of income. The table below summarizes recent forecasts of national residential electric prices for 2025 through 2040, expressed in real (after inflation) prices per kilowatt-hour:

Comparison of residential electric price forecasts
(In constant 2012 cents/kWh)

Source	2012	2025	2035	2040	Pct. Chg. 2012-2040
EIA AEO 2014	11.9	12.3	12.9	13.3	12%
IHSGI	11.9	13.6	14.4	14.5	22%
INFORUM	11.9	15.0	19.3	22.8	92%
Average	11.9	13.6	15.5	16.9	42%

Source: U.S. DOE/EIA Annual Energy Outlook 2014, Table CP4.

- ✓ The average of these three electricity price forecasts is a 42% overall increase in real (after inflation) residential electricity prices by the year 2040.

EPA Clean Power Plan Impacts

EPA's proposed Clean Power Plan (CPP) for reducing carbon dioxide emissions from the nation's existing fossil-fueled power plants will increase electric prices for 65+ households. The proposed rule sets forth "building blocks" of options for reducing emissions, focused on decreasing the use of coal in favor of natural gas, while increasing energy efficiency and renewable energy resources. EPA's goal is to reduce national CO₂ emissions from electric utilities by 30% below 2005 levels.

The CPP proposal was issued in June 2014, just after EPA issued proposed regulations that effectively bar the construction of new coal-based generation plants (see, 79 Fed. Reg. 1430, Jan. 8, 2014).

- ✓ The U.S. relied on coal for 41% of its electricity fuel supply in 2012, with natural gas supplying 24% of the energy input for electric generation. Nuclear energy and hydroelectric power supplied most of the remainder. (DOE/EIA 2012 State Energy Data).
- ✓ U.S. fossil-fueled electric utilities have reduced emissions of carbon dioxide by 12% since 2005, measured in pounds of CO₂ per Megawatt-hour (MWh) of electric generation, and by 13% measured in tons of CO₂ emitted (EPA CAMD Data Base, 2014). EPA's proposed CPP rule does not give credit for these reductions. It requires U.S. electric utilities to achieve an overall 24% reduction by 2030 from projected base case CO₂

emissions. Reductions range from 11% in North Dakota to 72% in Washington. Initial reductions are to occur by 2020, with the final goal achieved by 2030.

- ✓ EPA's proposed "building blocks" are state-specific, and call for a substantial portion of the target reduction to be achieved by switching from coal generation to higher-cost natural gas combined-cycle units, with additional reductions from new renewable energy projects and increased energy efficiency measures among consumers and industry. Existing coal generating plants are required to improve their energy efficiency by 6%. Each state will have flexibility in choosing among the measures it adopts, but the target emission reduction for each state is federally enforceable under the Clean Air Act.

EPA's proposed Clean Power Plan building blocks for each state are summarized in the table below. The percentages refer to the fraction of each state's total emission reduction goal to be achieved by the various building blocks:

% Contribution of Rate Reduction by Building Block in 2030 ¹					
State ²	Coal Heat Rate Improvement	Gas Redispatch	Nuclear	Renewable Energy ³	Energy Efficiency
Alabama	12%	27%	7%	30%	24%
Alaska	3%	29%	0%	13%	56%
Arizona	6%	62%	5%	5%	22%
Arkansas	9%	60%	3%	11%	17%
California	0%	20%	3%	27%	50%
Colorado	12%	41%	0%	21%	25%
Connecticut	0%	10%	14%	31%	45%
Delaware	5%	50%	0%	28%	17%
Florida	5%	55%	2%	17%	21%
Georgia	7%	25%	31%	16%	21%
Hawaii	10%	0%	0%	11%	78%
Idaho	0%	0%	0%	40%	60%
Illinois	12%	21%	12%	20%	35%
Indiana	24%	11%	0%	17%	48%
Iowa	18%	35%	2%	0%	44%
Kansas	19%	0%	6%	36%	40%
Kentucky	29%	15%	0%	8%	48%
Louisiana	7%	54%	3%	13%	22%
Maine	0%	10%	0%	0%	90%
Maryland	10%	6%	7%	40%	37%
Massachusetts	2%	22%	2%	40%	33%
Michigan	13%	32%	6%	13%	37%
Minnesota	9%	51%	5%	0%	35%
Mississippi	4%	57%	3%	16%	20%
Missouri	24%	25%	3%	8%	41%
Montana	24%	0%	0%	36%	40%
Nebraska	17%	14%	7%	26%	35%
Nevada	4%	44%	0%	25%	28%
New Hampshire	3%	30%	9%	40%	18%
New Jersey	2%	19%	9%	40%	29%
New Mexico	11%	38%	0%	23%	28%
New York	1%	24%	6%	36%	33%
North Carolina	9%	38%	6%	21%	27%
North Dakota	51%	0%	0%	5%	44%
Ohio	16%	14%	3%	29%	38%
Oklahoma	9%	50%	0%	21%	20%
Oregon	3%	27%	0%	35%	36%
Pennsylvania	11%	11%	7%	43%	27%
Rhode Island	0%	0%	0%	30%	70%
South Carolina	6%	14%	40%	19%	21%
South Dakota	9%	51%	0%	0%	40%
Tennessee	10%	10%	37%	14%	29%
Texas	8%	44%	1%	27%	20%
Utah	17%	40%	0%	12%	31%
Virginia	6%	33%	7%	31%	24%
Washington	3%	28%	3%	32%	35%
West Virginia	27%	0%	0%	52%	21%
Wisconsin	12%	33%	3%	18%	34%
Wyoming	26%	9%	0%	47%	18%

Notes: 1. Derived from <http://www2.epa.gov/sites/production/files/2014-06/20140602tsd-state-goal-data-computation.xlsx> and Appendix 1.

2. Calculations based on individual state utilization of a building block absent effects of implementation of other building blocks.

3. Excludes effects of existing renewable energy generation based on 2012 baseline.

The table below shows EPA's interim and final emission rate goals for each state, and the percent reduction from 2012 emission rates resulting from the application of EPA's proposed building blocks. The interim goal is to be met by 2020 using a multi-year average. The reductions are front-loaded, with most of the reductions to be achieved in the first years of the program.

EPA Clean Power Plan Emission Rate Targets by State (Lbs. CO ₂ /MWh)					
State	2012 Rate	Interim Goal 10-year Average	Interim Goal Reduction from 2012 (%)	Final Goal 2030-on	Final Goal Reduction from 2012 (%)
Alabama	1,444	1,147	21	1,059	27
Alaska	1,351	1,097	19	1,003	26
Arizona	1,453	735	49	702	52
Arkansas	1,634	968	41	910	44
California	698	556	20	537	23
Colorado	1,714	1,159	32	1,108	35
Connecticut	765	597	22	540	29
Delaware	1,234	913	26	841	32
Florida	1,199	794	34	740	38
Georgia	1,500	891	41	834	44
Hawaii	1,540	1,378	11	1,306	15
Idaho	339	244	28	228	33
Illinois	1,894	1,366	28	1,271	33
Indiana	1,924	1,607	16	1,531	20
Iowa	1,552	1,341	14	1,301	16
Kansas	1,940	1,578	19	1,499	23
Kentucky	2,158	1,844	15	1,763	18
Louisiana	1,455	948	35	883	39
Maine	437	393	10	378	14
Maryland	1,870	1,347	28	1,187	37
Massachusetts	925	655	29	576	38
Michigan	1,690	1,227	27	1,161	31
Minnesota	1,470	911	38	873	41
Mississippi	1,093	732	33	692	37
Missouri	1,963	1,621	17	1,544	21
Montana	2,246	1,882	16	1,771	21
Nebraska	2,009	1,596	21	1,479	26
Nevada	988	697	29	647	35
New Hampshire	905	546	40	486	46
New Jersey	928	647	30	531	43
New Mexico	1,586	1,107	30	1,048	34
New York	978	635	35	549	44
North Carolina	1,647	1,077	35	992	40
North Dakota	1,994	1,817	9	1,783	11
Ohio	1,850	1,452	22	1,338	28
Oklahoma	1,387	931	33	895	35
Oregon	717	407	43	372	48
Pennsylvania	1,531	1,179	23	1,052	31
Rhode Island	907	822	9	782	14
South Carolina	1,587	840	47	772	51
South Dakota	1,135	800	30	741	35
Tennessee	1,903	1,254	34	1,163	39
Texas	1,284	853	34	791	38
Utah	1,813	1,378	24	1,322	27
Virginia	1,302	884	32	810	38
Washington	756	264	65	215	72
West Virginia	2,019	1,748	13	1,620	20
Wisconsin	1,827	1,281	30	1,203	34
Wyoming	2,115	1,808	15	1,714	19

Source: U.S. EPA, Goal Computation Technical Support Document for the Clean Power Plan, Appendix 5 (2014).

EPA's proposed "building blocks" contain unrealistic assumptions on the potential for large-scale renewable energy and energy efficiency development within the short timetable of the EPA rule, and untenable projections of the potential for power plant efficiency improvements. The high level of efficiency improvements that EPA projects at coal-based power plants (6%) may not be feasible because the coal generating fleet is being retrofitted with emission controls to comply with EPA's 2011 Mercury and Air Toxics Standards, in many instances leading to decreased plant efficiency. Additional major investments in these plants are unlikely because EPA projects that the Clean Power Plan will reduce electric generation at coal-based facilities, thus limiting the opportunity to recover investment costs. (CPP RIA Table 3-15).

- ✓ EPA's Regulatory Impact Analysis for the CPP projects national costs of \$5.4 to \$7.4 billion annually in 2020. EPA's projections assume billions of dollars of annual savings from reductions of electric demand through widespread investments in energy efficiency measures.
- ✓ **EPA projects 5.9% to 6.5% average retail electric price increases for the proposed Clean Power rule in 2020, with increases as high as 10% to 12% in some regions** (CPP RIA Table 3-21). This projection is highly uncertain because it assumes that states will follow EPA's prescribed "building blocks" approach to emission reductions. If the flexibility measures in EPA's proposed rule prove unworkable, or are limited by judicial decisions, higher rate impacts could result.
- ✓ **EPA's projected national average 5.9% to 6.5% retail electric price increases due to EPA's Clean Power rule will follow a 3.1% average national price increase in 2015 for compliance with EPA's 2011 Mercury and Air Toxics Standards rule** (EPA MATS RIA, Table 3-12).
- ✓ **EPA's projected electric rate impacts are likely conservative. A March 2014 analysis by National Economic Research Associates of a CO2 reduction proposal very similar to the EPA Clean Power rule estimated national average residential electricity price increases of 3.0% to 11.4% over 2018-2033, depending upon the degree of flexibility in implementation** (NERA/ACCCE, March 2014). These price increases are in addition to those expected in 2015-2017 due to the implementation of the EPA mercury rule.
- ✓ **A new NERA analysis of the proposed Clean Power Plan indicates potential delivered electric price increases averaging 12% to 17% over the period 2017 to 2031, depending upon the degree of implementation flexibility. Total consumer energy costs could rise by \$366 to \$479 billion in net present value.** (NERA/ACCCE *et al.*, October 2014).
- ✓ **A July 2014 analysis by the Center for Strategic and International Studies (CSIS) and the Rhodium Group using EIA's NEMS energy model projects that national electric prices could increase by 5.4% to 9.9% due to the Clean Power rule** (CSIS at 28). These price increases also are in addition to the 3.1% increase for compliance with the EPA mercury rule.
- ✓ Both the timing and stringency of EPA's proposed reductions will challenge the nation's electric utilities, and will lead America to greater dependence on natural gas as a main source of electric generation. CSIS forecasts that **natural gas use could more than double as a percent of total electric generation, rising from 19% in 2010 to 43% in 2020** (CSIS at 17, national scenario without energy efficiency). Coal generation could decline from 46% to 21% over this period due to higher demand for natural gas.
- ✓ U.S. DOE projects that the price of natural gas delivered to electric utilities will increase at a compound annual rate of 3.1% above the rate of inflation between 2012 and 2040, the highest rate of real price increase for any delivered fuel in any sector of the economy (DOE Annual Energy Outlook 2014). **EPA projects that the Clean Power Plan will lead to further increases in delivered natural gas prices of 7.5% to 11.5% in 2020** (CPP RIA, June 2014).

Fuel Diversity and Reliability at Risk

The prospective reduction of fuel diversity in America's electric generating fleet due to greater dependence on natural gas for compliance with the Clean Power Plan will create additional risks of electric price volatility and higher costs for elderly consumers. A recent special report by IHS examined alternative scenarios of electric supply diversity and found that household disposable incomes could be reduced by more than \$2,000 annually where electric fuel supply choices are constrained:

To illustrate the importance of power supply diversity at the national level, IHS compared a base case—reflecting the generation mix in regional US power systems during the 2010-2012 period—with a reduced diversity case (a generating mix without meaningful contributions from coal and nuclear power and with a smaller contribution from hydroelectric power along with an increased share of renewable power. The remaining three-quarters of generation in the scenario come from natural gas-fired plants).

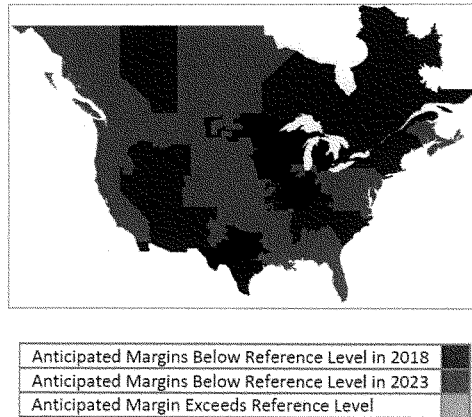
In this comparison, IHS found that the cost of generating electricity in the reduced diversity case was more than \$93 billion higher per year and the potential variability of monthly power bills was 50 percent higher compared to the base case. As a consequence, the study calculates that the typical household's annual disposable income to be around \$2,100 less in the reduced diversity scenario, there would be around one million fewer jobs compared to the base case and US gross domestic product (GDP) would be nearly \$200 billion less. Additional costs would arise if current trends lead to the retirement and replacement of existing power plants before it was economic to do so. See, <http://www.ihs.com/info/0714/power-diversity-special-report.aspx?ocid=uspowderv:pressrls:01> (emphasis added).

IHS's warning about additional electric cost increases due to the retirement of existing power plants before the end of their economic lifetimes is on point. **The CPP will cause the retirement of 30 to 49 Gigawatts of coal generating capacity by 2020** (CPP RIA, Table 3-12). This is in addition to more than 50 Gigawatts of coal capacity expected to be retired over the next few years as a consequence of compliance with EPA's 2011 MATS rule, low natural gas prices, and other factors. (U.S. DOE, Annual Energy Outlook, 2014). Overall, the nation will lose 126 Gigawatts of coal generating capacity between 2010 and 2020 with implementation of the CPP (CPP RIA, Table 3-12 and U.S. DOE 2012 Annual Energy Review). **EPA projects that total coal production for electric generation will decline from 844 million tons in the 2020 base case to 616 to 636 million tons under the CPP, a reduction of 25% to 27%** (CPP RIA, Table 3-15).

The December 2013 Long-Term Reliability Assessment by the North American Electric Reliability Corporation (NERC) raises concerns about the future reliability of the nation's bulk power supply based on then-current regulatory requirements, excluding the CPP. NERC finds that one-half of the electric reliability regions may fall below reserve margin standards deemed necessary to ensure reliability:

Based on the 2013LTRA reference case, the Anticipated Planning Reserve Margins for 13 of the 26 NERC assessment areas will remain above the NERC Reference Margin Levels throughout the 10-year period (NERC LTRA, p. 5)

NERC Projection of Regional Reserve Margins below the Reference Margin, 2018 and 2023



Source: NERC LTRA (December 2013), Fig. 1.

- ✓ NERC's assessment identifies near-term potential reliability issues in the Texas, Great Lakes, and Midwest regions, reflecting a growing imbalance of generating resources and demand. This imbalance, attributable to a variety of factors including the retirements of existing generating assets, is projected to expand by 2023 to the New York/New England, Rocky Mountain, Southwest, and Southeast regions.
- ✓ The expected retirement of an additional 30 to 49 Gigawatts of coal generating capacity due to EPA's Clean Power Plan will contribute further to inadequate reserve margins in several regions, particularly if EPA's ambitious energy efficiency goals are not met. **The additional baseload generation capacity projected to retire due to the Clean Power Plan would increase the risks of brownouts, load curtailments, and other power disruptions in regions impacted by these retirements.**

Additional Regulatory Impacts

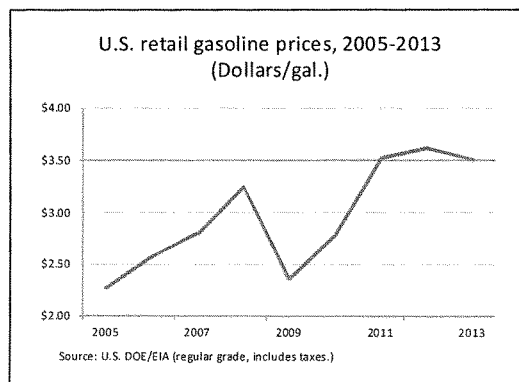
Recent and pending U.S. EPA regulations will add further cost pressures to the electric generating sector over the next few years, directly impacting electric bills in America.

- ✓ EPA's Regulatory Impact Analysis for its 2011 Mercury and Air Toxics Standards projects that this rule will cost an average of \$9.6 billion annually, and will increase average retail electricity prices by 3.1% in 2015 (EPA MATS RIA, Tables ES-1 and 3-12).
- ✓ **A new ozone standard could dramatically increase energy costs for all American consumers and industries.** EPA plans to revise the 2008 National Ambient Air Quality Standard for ozone, currently set at a level of 75 parts per billion (ppb), in late 2015. A July 2014 analysis by National Economic Research

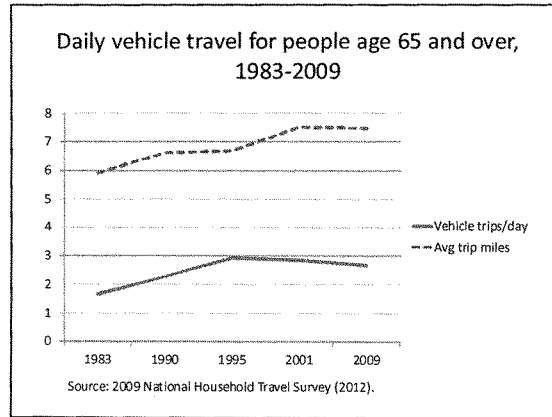
Associates of a potential new ozone standard set at a level of 60 ppb indicates that such a standard could impose \$348 billion in annual compliance costs across the nation. NERA projects that national average residential electricity prices would increase by 3.3% to 15%, while residential natural gas prices could rise by 7% to 32%. The upper end estimates of these price increases reflects the potential that a new ozone standard set at such a stringent level could constrain future natural gas development, causing both electricity and natural gas prices to increase significantly. (NERA/NAM, July 2014, Figs. S-9, S-15).

Gasoline costs are high

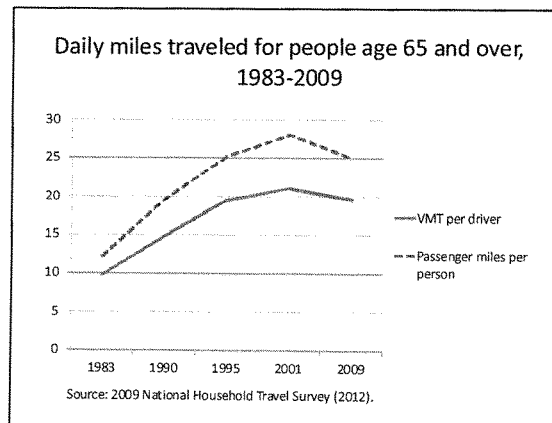
Gasoline is the largest single consumer energy expenditure for most U.S. households, including the majority of 65+ households. Gasoline prices have declined recently, but the outlook is for continued high prices. U.S. DOE projects average gasoline prices of \$3.38 per gallon in 2015 (DOE/EIA, Short-Term Energy Outlook, October 2014).



- ✓ Average retail gasoline prices per gallon increased by 55% since 2005, a rate nearly three times greater than the 19% rate of inflation measured by the Consumer Price Index.
- ✓ Seniors drive fewer miles annually than younger people, since most are not commuting to work or school. Gasoline costs nevertheless account for a significant annual energy expense for most senior citizens.
- ✓ U.S. DOT's 2009 National Household Travel Survey (2012) shows that 65+ seniors have increased their average vehicle miles traveled (VMT) since 1983, through a combination of more daily vehicle trips per driver and longer average vehicle trip lengths:



- ✓ The average number of daily vehicle trips per 65+ driver increased by 61% from 1983 to 2009, while average trip length increased by 26%, from 5.9 miles in 1983 to 7.5 miles in 2009.
- ✓ Average daily vehicle miles traveled per 65+ driver more than doubled between 1983 and 2009, from 9.8 miles to 19.7 miles, as shown in the chart below:



- ✓ The vast majority of 65+ citizens are drivers. Some 91% of persons aged 60 to 69 are drivers, while 83% of those aged 70 to 79 drive. More than 60% of the 80+ population also drive (2009 NHTS, 2012).
- ✓ With an expected 60% increase in the number of 65+ persons over the next 15 years, the proportion of 65+ drivers on the road will increase from 15% in 2009 to 20% by 2025 (AARP Public Policy Institute, 2011).
- ✓ Assuming an average of 19.7 miles driven per day for 65+ drivers, and 17 miles per gallon for the average fuel economy of light duty vehicles now on the road, America's 65+ drivers will each spend approximately \$1,500 annually with gasoline prices of \$3.50 per gallon.

Energy Cost Increases Pose Health Risks for Low-Income Seniors

Increased energy costs function as a regressive tax on lower-income senior citizens least able to afford them by seeking employment or additional sources of income. A 2009 survey by the Applied Public Policy Research Institute for Study and Evaluation (APPRISE, July 2010) focused on the demographic, economic, and health circumstances of persons able to qualify for the federal Low Income Heating and Energy Assistance Program (LIHEAP). Nearly 1,900 interviews were completed in 13 states. Some 39% of respondents were senior citizens age 65 or older.

Among the senior population in the APPRISE survey, the following health conditions were reported:

Asthma symptoms - 42%
Hypertension, heart disease, heart attack or stroke - 75%
Bronchitis, emphysema, or COPD - 22%

Survey respondents reported the following health-related responses to energy costs (events within five years of the survey):

Went without food for at least one day - 30%
Went without medical or dental care - 41%
Did not fill prescription or took less than full dose - 33%
Unable to pay energy bill due to medical expenses - 22%
Became sick because home was too cold - 25%

The APPRISE survey data provide insights into the real-world consequences of high energy costs among America's senior population, as well as the prevalence of poor health conditions among lower-income seniors. Energy costs are constraining household budget choices for necessities such as food and limiting access to medical services.

Social Security At Risk

Social Security is a principal source of income for America's senior citizens. In 2012, 29% of America households received basic Social Security benefits averaging \$16,977 per household (Bureau of the Census, 2012 American Community Survey, 2014). The future stability of this income, however, cannot be assured due to the rapidly changing dynamics of the U.S. population, and the projected increase in Social Security recipients. The Congressional Budget Office's latest assessment of the health of the Social Security system reveals the extent of these risks:

In calendar year 2010, for the first time since the enactment of the Social Security Amendments of 1983, annual outlays for the program exceeded annual tax revenues (that is, outlays exceeded total revenues excluding interest credited to the trust funds). In 2012, outlays exceeded noninterest income by about 7 percent, and CBO projects that the gap will average about 12 percent of tax revenues over the next decade. As more members of the baby-boom generation retire, outlays will increase relative to the size of the economy, whereas tax revenues will remain at an almost constant share of the economy. As a result, the gap will grow larger in the 2020s and will exceed 30 percent of revenues by 2030.

CBO projects that under current law, the DI (Disability Insurance) trust fund will be exhausted in fiscal year 2017, and the OASI (Old Age and Survivors) trust fund will be exhausted in 2033. If a trust fund's balance fell to zero and current revenues were insufficient to cover the benefits specified in law, the Social Security Administration would no longer have legal authority to pay full benefits when they were due. In 1994, legislation redirected revenues from the OASI trust fund to prevent the imminent exhaustion of the DI trust fund. In part because of that experience, it is a common analytical convention to consider the DI and OASI trust funds as combined. Thus, CBO projects, if some future legislation shifted resources from the OASI trust fund to the DI trust fund, the combined OASDI trust funds would be exhausted in 2031. *See*, <http://www.cbo.gov/publication/44972>.

Conclusion

Low- and fixed-income seniors are among the most vulnerable to electric rate and other energy price increases. Current and pending U.S. EPA regulations will increase the price of electricity in America at rates above the general rate of inflation. Rising oil and natural gas prices will add further pressure on residential natural gas and gasoline prices. The 65% of America's 65+ households with gross incomes less than \$50,000 annually will be among those least able to afford these energy price increases.

Just maintaining the energy budget status quo for America's 65+ fixed income population requires stable electricity and other energy prices that do not increase above the rate of inflation. Lower-income seniors are among those least likely to make major investments in new energy efficiency programs with long investment payback times, as envisioned by EPA's Clean Power Plan. The suite of new regulations EPA is now pursuing inevitably will lead to ever-higher utility prices for America's elderly population, exceeding the modest cost-of-living (COLA) adjustments that many 65+ retirees depend upon just to keep up with inflationary pressures.

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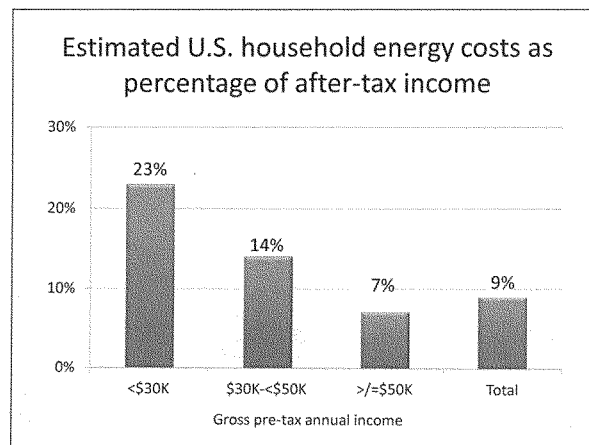
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Acknowledgment: This paper was prepared for the 60 Plus Association by Eugene M. Trisko, an independent energy economist and attorney (B.A., Economics and Politics, NYU, 1972; J.D., Georgetown University Law Center, 1977). Mr. Trisko has served as an expert economic witness before state public utility commissions, and as an attorney in the Federal Trade Commission Bureau of Consumer Protection. He may be contacted at emtrisko@earthlink.net.



Energy Cost Impacts on American Families

Rising electricity prices and declining family incomes are straining the budgets of America's lower- and middle-income families. U.S. households with pre-tax annual incomes below \$50,000, representing 48% of the nation's households, spend an estimated average of 17% of their after-tax income on residential and transportation energy. Energy costs for the 29% of households earning less than \$30,000 before taxes represent 23% of their after-tax family incomes, before accounting for any energy assistance programs. Minorities and senior citizens are among the most vulnerable to energy price increases due to their relatively low household incomes.



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Energy Cost Impacts on American Families

This paper assesses the impact of energy costs on U.S. households using energy consumption survey data and energy price data and projections from the U.S. Department of Energy's Energy Information Administration (DOE/EIA).¹ Energy costs are summarized by household income group using data from the Bureau of the Census, tax data from the Congressional Budget Office, and state income tax rates.² Due to recent volatility in energy markets, energy expenditure estimates are based on DOE/EIA energy price projections for 2016.

Key findings include:

- Some 48% of American families have pre-tax annual incomes of \$50,000 or less, with an average after-tax income among these households of \$22,732, less than \$1,900 per month. In other words, nearly half of U.S. families - some 59 million households - have average take-home income of less than \$1,900 per month.
- Energy costs are consuming the after-tax household incomes of America's lower- and middle-income families at levels comparable to other necessities such as housing, food, and health care. The 48% of households earning less than \$50,000 devote an estimated average of 17% of their after-tax incomes to residential and transportation energy.
- American consumers have benefitted in recent months from lower gasoline prices, but rising oil prices are now reducing consumer savings at the gas pump. Meanwhile, residential electricity prices are rising due to the costs of compliance with U.S. EPA and other regulations, and other factors such as fuel and capital costs. Residential electricity represents 69% of total household utility bills.
- A 2011 survey of low-income households for the National Energy Assistance Directors Association reveals some of the adverse health and welfare impacts of high energy costs. Low-income households reported these responses to high energy bills:
 - 24% went without food for at least one day.
 - 37% went without medical or dental care.
 - 34% did not fill a prescription or took less than the full dose.
 - 19% had someone become sick because their home was too cold.
- The relatively low median incomes of minority and senior households indicate that these groups are among those most vulnerable to energy price increases. Median income is the midpoint, where one-half of households have incomes above this amount, and one-half have incomes below it. The median pre-tax income of Black households, representing 13% of U.S. households, is 33% below the U.S. median income of \$51,939. The median income of Hispanic households, 13% of all households, is 21% below the national median income. American households aged 65 or more, 23% of all households, have a median income 31% below the U.S. median.

U.S. Household Incomes

U.S. Census Bureau data on household incomes in 2013 (the most recent available) provide the basis for estimating the effects of energy prices on consumer budgets. The table below shows estimated 2013 after-tax incomes for U.S. families in different income brackets. The Congressional Budget Office has calculated effective total federal tax rates, including individual income taxes and payments for Social Security and other social welfare programs. State income taxes are estimated from current state income tax rates.

U.S. households by pre-tax and after-tax income, 2013

Pre-tax annual income:	<\$30K	\$30- <\$50K	<\$50K	≥\$50K	Total/avg.
Households (Mil.)	35.8	23.1	59.0	64.0	123.0
Pct. of total households	29%	19%	48%	52%	100.0%
Avg. pre-tax income	\$15,931	\$39,158	\$25,043	\$116,503	\$72,641
Effec. fed tax rate %	4.2%	11.0%	6.9%	19.7%	19.4%
Est. state tax %	0.5%	3.5%	2.4%	6.3%	4.4%
Est. after-tax income	\$15,003	\$33,480	\$22,732	\$86,212	\$55,344

Some 48% of U.S. families, 59 million households, had estimated pre-tax incomes below \$50,000 in 2013. After federal and state taxes, these families had average annual incomes of \$22,732, equivalent to an average monthly take-home income of less than \$1,900.

The U.S. Census Bureau reports that the real pre-tax incomes of American families have declined across all five income quintiles since 2001, measured in constant 2013 dollars.³ The loss of real pre-tax incomes is due to a number of factors, including the lack of real wage growth among most American workers,⁴ the loss of high-wage jobs in manufacturing and other industry sectors,⁵ and the increased share of relatively low-paying jobs in service sectors such as retail trade and food services.⁶

As shown in the table below, the largest losses of income are in the two lowest income quintiles. Households in the lowest quintile lost 13% of their real income between 2001 and 2013. Declining real incomes increase the vulnerability of lower- and middle-income households to energy price increases such as rising utility bills.

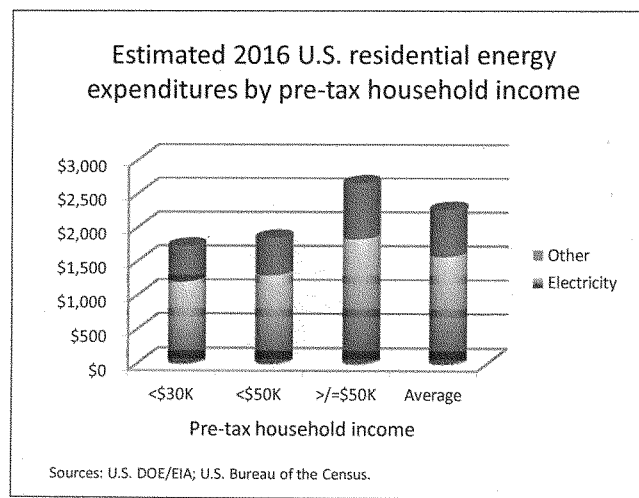
Average real U.S. household incomes by income quintile, 2001-2013
(In 2013 \$)

	1Q	2Q	3Q	4Q	5Q
2001	\$13,336	\$33,510	\$56,090	\$87,944	\$192,063
2013	\$11,651	\$30,509	\$52,322	\$83,519	\$185,206
Pct Chg	-13%	-9%	-7%	-5%	-4%
\$ Chg	(\$1,685)	(\$3,001)	(\$3,768)	(\$4,425)	(\$6,857)

Residential and Transportation Energy Expenses

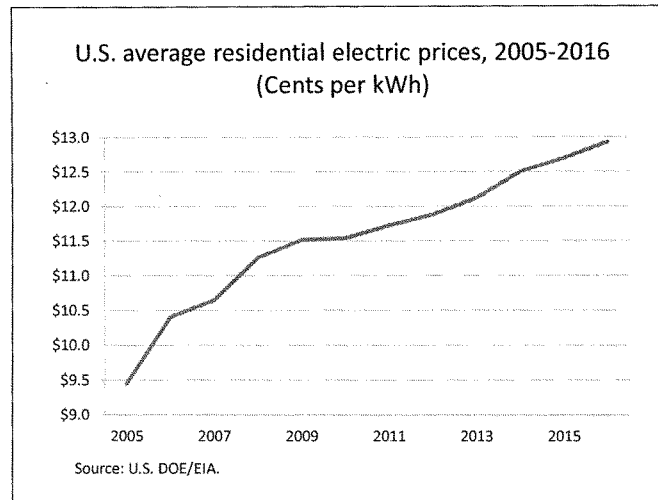
U.S. households are projected to spend an estimated average of \$2,256 for residential energy in 2016.⁷ As shown in Chart 1 below, electricity is the dominant residential energy source, accounting for 69% of total U.S. residential energy expenditures for home heating, cooling, and appliances. In addition to natural gas, some U.S. homes also use heating oil, propane, and other heating sources such as wood.

Chart 1



In 2014, the average price of residential electricity in the U.S. was 32% above its level in 2005 (see Chart 2), compared with a 22% increase in the Consumer Price Index during this period. DOE/EIA projects continued escalation of residential electricity prices due to the costs of compliance with environmental regulations and other factors, including fuel, capital, and operating and maintenance costs. Moreover, EIA,⁸ National Economic Research Associates,⁹ and others¹⁰ project that electricity prices will increase even more because of EPA's proposed Clean Power Plan.

Chart 2



Energy Expense Estimates

Estimated household energy expenses for the U.S. are based upon DOE/EIA residential energy price projections for 2016.¹¹ Total household energy costs are distributed by income category using DOE/EIA residential energy survey data.

Following sharp price declines since late 2014, gasoline prices have begun to increase in response to higher oil prices. EIA's May 2015 Short-Term Energy Outlook projects national average gasoline prices of \$2.52/gallon in 2015, rising to \$2.71/gallon in 2016. This 2016 projection is based upon EIA's estimate of an average \$66/barrel price for West Texas Intermediate crude oil in 2016, with an average imported crude oil price of \$62/barrel. These projections may be conservative in view of the ongoing reduction of domestic drilling investments caused by lower oil prices. Baker Hughes reports that domestic oil and gas drill rig counts have declined by 52% since May 2014.¹²

DOE/EIA's 2001 Survey of Household Vehicles Energy Use (2005) provides data on regional gasoline use by household income category. These regional gasoline consumption data are updated using EIA's 2016 national average retail gasoline price projection of \$2.71 per gallon. Household gasoline consumption is reduced by 15% from 2001 levels, reflecting trends in per capita retail gasoline sales.¹³

The table below summarizes estimated U.S. household energy expenses in 2016 by income group, with the percentage of after-tax income represented by energy costs:

Estimated U.S. household energy costs by pre-tax income category

Pre-Tax Annual Income:	<\$30K	\$30- <\$50K	<\$50K	≥\$50K	Average
Residential energy \$	\$1,712	\$1,990	\$1,834	\$2,644	\$2,256
Electric \$	\$1,187	\$1,406	\$1,282	\$1,818	\$1,561
Other* \$	\$526	\$584	\$553	\$826	\$695
Gasoline \$	\$1,729	\$2,569	\$2,059	\$3,447	\$2,781
Total energy \$	\$3,441	\$4,559	\$3,893	\$6,091	\$5,037
Energy % of after-tax income	23%	14%	17%	7%	9%

*Other includes natural gas, heating oil, LPG, and wood.

The share of household income spent for energy falls disproportionately on lower- and middle-income families earning less than \$50,000 per year before taxes. The 59 million U.S. households earning less than \$50,000 before taxes spend an estimated 17% of their after-tax income on energy.

While many lower-income consumers qualify for energy assistance, budgetary support for these government programs has been pared back in recent years.¹⁴ Most of the \$3.0 billion of funds available to states under the federal LIHEAP program are concentrated on relief for low-income home heating customers in the Northeast. In comparison to the \$3.0 billion available under LIHEAP, total residential energy costs for the 36 million households with pre-tax incomes less than \$30,000 are estimated at \$62 billion in 2016, including \$43 billion in electricity costs.

The average U.S. family will spend an estimated \$5,037 on residential and transportation energy in 2016, or 9% of the after-tax family budget. The 36 million U.S. households earning less than \$30,000 before taxes, representing 29% of households, will allocate, on average, an estimated 23% of their after-tax incomes to energy.

These findings are consistent with the most recent consumer expenditure survey by the Bureau of Labor Statistics.¹⁵ BLS reports that total expenditures for residential utilities and gasoline are 9% of the average American after-tax household budget. BLS's survey also indicates that energy costs for residential utilities and gasoline rank among those for other basic necessities such as rent, education, clothing, and health care:

BLS 2013 annual consumer expenditure survey
findings for selected expenditure categories,
all U.S. households

Expenditure	Annual \$2013	Pct. of Average After-Tax Household Income
Food	\$6,602	12%
Rent	\$3,324	6%
Health care	\$3,631	6%
Mortgage interest	\$3,078	5%
Gasoline	\$2,611	5%
Residential utilities & fuels*	\$1,957	4%
Clothing	\$1,604	3%
Education	\$1,138	2%

*Excluding water, telephone, and cell phone service.

The large share of after-tax income devoted to energy by lower-income households poses difficult budget choices among food, health care and other basic necessities. A 2011 survey of low-income households for the National Energy Assistance Directors Association (NEADA) reveals many of the adverse health and welfare implications of high energy costs. Ninety-two percent of the NEADA survey participants reported pre-tax household incomes of \$30,000 or less. Principal findings of the survey include:

Households reported that they took several actions to make ends meet:

- 39% closed off part of their home.
- 23% kept their home at a temperature that was unsafe or unhealthy.
- 21% left their home for part of the day.
- 33% used their kitchen stove or oven to provide heat.

Many survey respondents had problems paying for housing in the past five years, due at least partly to their energy bills:

- 31% did not make their full mortgage or rent payment.
- 6% were evicted from their home or apartment.
- 4% had a foreclosure on their mortgage.
- 14% moved in with friends or family.
- 4% moved into a shelter or were homeless.
- 13% got a payday loan in the past five years.

Many of the respondents faced significant medical and health problems in the past five years, partly as a result of high energy costs:

- 24% went without food for at least one day.
- 37% went without medical or dental care.
- 34% did not fill a prescription or took less than the full dose.
- 19% had someone become sick because their home was too cold.¹⁶

Disproportionate Impacts on Minorities and Senior Citizens

The impacts of high energy costs are falling disproportionately on minorities and senior citizens. Black and Hispanic households together represent 26% of U.S. households. Elderly households represent 23% of American households. Unlike young working families with the potential to increase incomes by taking on part-time work or increasing overtime, many fixed income seniors are limited to cost-of-living increases that may not keep pace with energy prices.

The table below summarizes 2013 median pre-tax incomes for elderly and minority households, and compares these with the U.S. median household income of \$51,939.

U.S. median pre-tax household incomes, 2013

	Median Household Income	Pct. Diff. Vs. U.S. Median	Pct. of Households
U.S.	\$51,939		100%
Black	\$34,598	-33%	13%
Hispanic	\$40,963	-21%	13%
Age 65+	\$35,611	-31%	23%

Source: U.S. Bureau of the Census, Current Population Reports Supplement (2014).

These relatively low median incomes - ranging from 21% to 33% below the national median - indicate that minority and senior households are among those most vulnerable to energy price increases such as rising household utility bills.

Conclusion

High consumer energy prices - together with negative real income growth among lower- and middle-income households - underscore the need to maintain affordable energy prices, especially for lower- and middle-income U.S. families. Maintaining the relative affordability of electricity and other energy sources is essential to the wellbeing of America's lower- and middle-income families.

Acknowledgment: This paper was prepared for ACCCE by Eugene M. Trisko, an energy economist and attorney in private practice. Mr. Trisko has served as an attorney in the Bureau of Consumer Protection at the Federal Trade Commission and as an expert economic witness before state public utility commissions. He represents labor and industry clients in environmental and energy matters. Mr. Trisko can be contacted at emtrisko@earthlink.net.

End Notes

¹ Data on residential energy consumption patterns by income category are derived from U.S. Department of Energy, Energy Information Administration, 2009 Survey of Residential Energy Consumption (2012). 2016 gasoline price projections are from DOE/EIA Short Term Energy Outlook (May 2015).

² Household incomes by income category are calculated from the distribution of household income in U.S. Census Bureau, Current Population Reports, Supplement (2014). Federal income tax rates are from Congressional Budget Office, "The Distribution of Household Income and Federal Taxes, 2010 with Estimates for 2013," (December 2013). Effective federal tax rates for the income categories employed in this report were interpolated from CBO's 2013 tax rates by income quintile. State tax data are estimated from state tax rates compiled by the Tax Foundation (2014).

³ See, <https://www.census.gov/hhes/www/income/data/historical/household/>.

⁴ See, H. Shierholz and L. Mishel, A Decade of Flat Wages - The Key Barrier to Shared Prosperity and a Rising Middle Class (Economic Policy Institute, August 21, 2013), available at: <http://www.epi.org/publication/a-decade-of-flat-wages-the-key-barrier-to-shared-prosperity-and-a-rising-middle-class/>.

⁵ The U.S. lost 5.7 million manufacturing jobs in the decade of the 2000s, the largest decline of manufacturing jobs since the 1980s, while total manufacturing output declined by 11%. The sectors with large output losses included motor vehicles (-45%), textiles (47%) and apparel (-40%). Increased foreign competition is cited as one factor underlying these trends. See, e.g., <http://www.industryweek.com/global-economy/why-2000s-were-lost-decade-american-manufacturing>.

⁶ The share of U.S. employment in service sectors increased from 76% in 1990 to 84% in 2010, while the share of employment in goods-producing sectors declined from 20% to 13%. See, C. Haksaver and B. Render, The Important Role Services Play in an Economy (2013), excerpted at <http://www.ftpress.com/articles/article.aspx?p=2095734&seqNum=3>.

⁷ Residential energy expenditures are estimated from DOE/EIA 2009 Residential Energy Consumption Survey (2012) updated for 2013 household demographics and DOE/EIA's 2016 projections of residential energy costs for electricity, natural gas, LPG, and home heating oil in EIA's Short-Term Energy Outlook (May 2015).

⁸ DOE/EIA, Analysis of the Impacts of the Clean Power Plan (May 2015).

⁹ National Economic Research Associates, Potential Energy Impacts of the Proposed Clean Power Plan (prepared for ACCCE, October 2014).

¹⁰ See, e.g., Energy Ventures Analysis, Inc., EPA Clean Power Plan: Costs and Impacts on U.S. Energy Markets (prepared for National Mining Association, October 2014).

¹¹ U.S. DOE/EIA, Short-Term Energy Outlook (May 2015).

¹² Drilling rig data as of May 8, 2014 and May 8, 2015. *See*, <http://phx.corporate-ir.net/phoenix.zhtml?c=79687&p=irol-rigcountsoverview>

¹³ DOE/EIA and Census Bureau data indicate that per capita retail gasoline consumption declined by 15% from 2001 to 2014. *See*, D. Short, Gasoline Sales and Our Changing Culture (April 22, 2015), available at <http://www.advisorperspectives.com/dshort/updates/Gasoline-Sales.php>

¹⁴ Federal funding for the Low Income Home Energy Assistance Program (LIHEAP) has declined from \$4.5 billion in FY2011 to \$3.0 billion in FY2015. *See*, <http://www.liheapch.acf.hhs.gov/Funding/funding.htm>.

¹⁵ Bureau of Labor Statistics, 2013 Consumer Expenditure Survey, Table 1202, Annual expenditure means, shares, standard errors and coefficient of variation (2014).

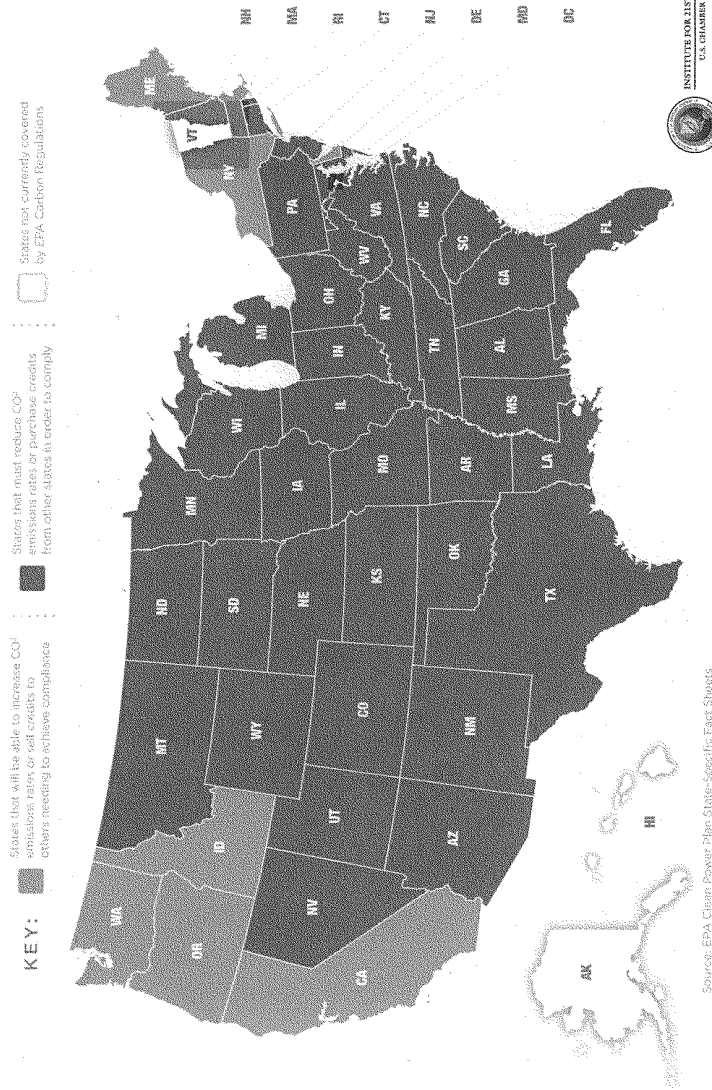
¹⁶ NEADA, National Energy Assistance Survey Report (November 2011) at ii.

Appendix II

SLIDES

SLIDE SUBMITTED BY REPRESENTATIVE BIRDENSTINE

Winners and Losers from EPA Carbon Regulations COMPARISON OF 2020 EPA PROJECTIONS AND 2030 FINAL REQUIREMENTS



SLIDE SUBMITTED BY REPRESENTATIVE FOSTER

9/21/2015

Death and Disease from Power Plants - Clean Air Task Force (CATF)



Clean Air Task Force is a nonprofit organization dedicated to reducing atmospheric pollution through research, advocacy, and private sector collaboration.

Fossil Transition

[Problems of Coal](#)

[CO₂ Pollution from Coal](#)

[Non-CO₂ Pollution from Coal](#)

[Combustion Waste](#)

[Problems of Gas](#)

[CO₂ Technology Solutions](#)

[Policy Solutions for CCS](#)

[Where It's Happening](#)

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Additional Resources:

[Per Capita Power Plant Impacts by Metropolitan Area](#)

[Total Power Plant Impacts by Metropolitan Area](#)

[Per Capita Power Plant Impacts by State](#)

[Total Power Plant Impacts by State](#)

Death and Disease from Power Plants

In 2000, 2004 and again in 2010, the Clean Air Task Force issued studies based on work by Abt Associates quantifying the deaths and other adverse health affects attributable to the fine particle air pollution resulting from power plant emissions. Using the most recent emissions data, in this 2014 study, CATF examines the continued progress towards cleaning up one of the nation's leading sources of air pollution. This latest report finds that over 7,500 deaths each year are attributable to fine particle pollution from U.S. power plants. This represents a dramatic reduction in power plant health impacts from the previous studies.

This reduction reflects improvements due to a variety of federal and state regulatory and enforcement initiatives that CATF has supported, including the Mercury and Air Toxics Rule (MATS) and the Cross-State Air Pollution Rule (CSAPR) and the active enforcement of existing regulations such as New Source Review (NSR). Since 2004, these measures have dropped Sulfur Dioxide (SO₂) pollution by 68% and Nitrogen Oxide (NO_x) by 55%, the leading components of fine particle pollution. This was achieved through the near doubling of the amount of scrubbers (the technology used for reducing SO₂ pollution) installed at power plants and additional retirements of coal capacity. Yet, despite this progress, some in the power industry and several recalcitrant states persist in trying to overturn the MATS and CSAPR regulations in court and reverse this life-saving trend.

Our 2004 study showed that power plant impacts exceeded 24,000 deaths a year, but by 2010 that had been reduced to roughly 13,000 deaths due to the impact that state and federal actions were beginning to have. The updated study shows that strong regulations that require stringent emission controls can have a dramatic impact in reducing air pollution across the country, saving lives, and avoiding a host of other adverse health impacts. The study also shows regrettably that some areas of the country still suffer from unnecessary levels of pollution from power plants that could be cleaned up with the application of proven emission control technologies.

The interactive map below allows you to learn of the risk in your state or county simply by clicking on the Google Map. Click on your state, zoom into your county, or click on a power plant to view a variety of health impacts and other data.

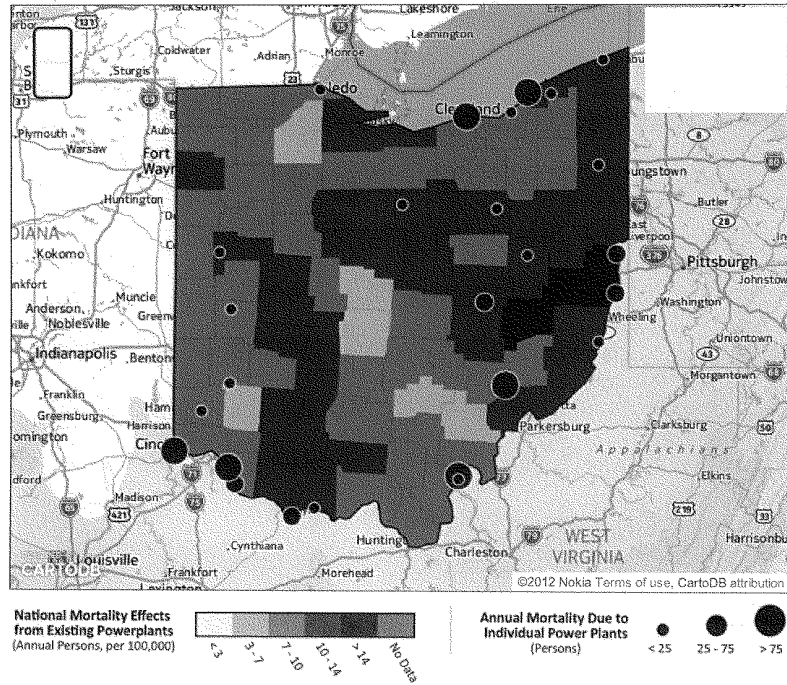
Find Your Risk from Power Plant Pollution

http://www.catf.us/fossil/problems/power_plants/

9/21/2015

Death and Disease from Power Plants - Clean Air Task Force (CATF)

(Click on Your State Below)



* The results shown represent a specific year's plant operations. Plant operating levels change from year to year, and can be higher or lower than represented in our data. However, for the most part, power plant health impacts have dropped significantly in recent years. Data is estimated 2012 impacts. All monetary values are expressed in thousands of dollars. County level data is health impacts/100,000 persons.

Clean Air Task Force 18 Tremont Street, Suite 530, Boston, MA 02108 | Phone: 617-624-0234 | Fax: 617-624-0230

All references to Taiwan on this website refer to Taiwan, China, consistent with the Joint Communiqué on the Establishment of Diplomatic Relations between the United States of America and the People's Republic of China, 1 January 1979.