REINVIGORATING THE ECONOMY THROUGH STIMULUS LEGISLATION: OPPORTUNITIES FOR ALL

HEARING

BEFORE THE

SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING HOUSE OF REPRESENTATIVES

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REINVIGORATING THE ECONOMY THROUGH STIMULUS LEGISLATION: OPPORTUNITIES FOR ALL

THURSDAY, JANUARY 15, 2009

HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE ON ENERGY INDEPENDENCE
AND GLOBAL WARMING,
Washington, DC.

The committee met, pursuant to other business, at 2:20 p.m. in room 2172, Rayburn House Office Building, Hon. Edward J. Markey (chairman of the committee) presiding.

Present: Representatives Markey, Blumenauer, Inslee, Larson, Solis, Herseth Sandlin, Cleaver, Hall, Sensenbrenner, Shadegg, Walden, Miller, Sullivan, and Blackburn.

Staff present: Danielle Baussan, Jonathan Phillips.

The CHAIRMAN. For that purpose, I welcome back the members of the select committee for the first hearing of a new year. The beginning of a new year often prompts people to appraise the previous 12 months and, sensing the promise of a fresh start, resolve to improve over the next 365 days. Though some New Year's resolutions have a habit of going in one year and out the other, Congress cannot weaken its resolve to address two of the most important issues before the Nation, restoring the economy and fighting climate change.

Over the past year, the U.S. economy suffered through a market meltdown, a foreclosure crisis, and volatile oil and commodity prices. During this time, 2.6 million U.S. jobs were lost; the Southeast suffered a serious drought; and a coal ash catastrophe in Tennessee created more environmental damage than the Exxon Valdez oil spill. We must prevent 2009 from having a similar summary.

The Obama administration has outlined an economic stimulus plan to revive the economy through tax incentives and millions of jobs in renewable energy, infrastructure improvements, increased State and local aid, and improving the energy efficiency of buildings. These initiatives offer an unprecedented opportunity for green collar jobs and environmental reform to be the backbone of a stronger economy.

Just this past week, it was reported that a sustainable building supply company, Serious Materials, is working with a bankruptcy court to buy a traditional window factory that closed last December. The company is trying to rehire 300 workers who were laid off with 3 days notice. Congress and the administration must support these efforts on a national scale.

The stimulus package cannot be a plan to dig ditches or create a couple of pork ridden specialty projects. These greenbacks should yield green results for all. A stimulus package focused on more efficient and renewable energy can result in greater labor intensity and higher wages than investing in oil production.

This is not robbing Peter to pay Paul. The Center for American Progress predicts a net increase of jobs created if Congress supports expanding the renewable energy and energy efficiency industries.

As the stimulus plan is adopted, it must reflect short-term and long-term benefits, direct infusion to States and localities, and kick-start economic and energy development. Energy efficiency and weatherization can be deployed immediately through existing skill sets and technology. Tax incentives can encourage greater investment and employment in renewable industries, while smart grid development can sustain a national network of long-term permanent employees.

A green economy didn't get us into this mess, but it can get us out. The promise of a green economy can be met in every State, in every demographic. It is estimated that 30 percent of jobs created or sustained through the stimulus bill will be in construction and manufacturing, with another large share in the retail, hospitality, and mining industry. These sectors employ many low- and middle-income workers who have been hardest hit by the recession.

Technological advancements and corporate investment opportunities can augment these economic gains. Congress and the administration must seek ways to find a green economic tide that lifts all boats.

Some people may look forward to the new year as a new start on old habits, but we cannot afford to overlook the opportunity to strengthen the economy by developing a globally competitive industry for renewable energy, restoring our failing infrastructure, and increasing environmental and energy security. This is one resolution we cannot and will not break.

Let me turn and recognize the gentleman from Wisconsin, Mr. Sensenbrenner, for his opening statement.

[The statement of Mr. Markey follows:]

THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

Opening Statement of Chairman Edward J. Markey (D-Mass.)
Select Committee on Energy Independence and Global Warming
"Stimulus Package and Energy: Creating Jobs, Opportunities for All"
Thursday, January 15, 2009

I welcome back the members of the Select Committee for our first hearing of 2009. I am extremely proud of the work this committee accomplished during the last Congress, and want to thank Ranking Member Sensenbrenner and all the members of the Committee for their contributions. Together we stand on the front lines of the fight to rescue our economy, re-power our energy sector and protect our planet.

The beginning of a New Year often prompts resolutions to improve the next 12 months, and this year is no different. Though some New Year's resolutions have a habit of "going in one year and out the other," Congress cannot weaken its resolve to address three of the most important issues before the nation: restoring the economy, increasing energy independence and fighting climate change.

Over the past year, the U.S. economy suffered through a market meltdown, a foreclosure crisis, and a volatile oil market. In 2008 2.6 million U.S. jobs were lost, the Southeast suffered a serious drought while the Midwest saw tragic flooding, and a coal ash catastrophe in Tennessee spread hazardous waste 50 times greater in volume than the Exxon Valdez oil spill.

We must prevent a similar summary for 2009. The Obama administration has outlined an economic stimulus plan to revive the economy through tax incentives and millions of jobs in renewable energy, infrastructure improvements, increased state and local aid, and improving the energy efficiency of buildings. These initiatives offer an unprecedented opportunity for green-collar jobs and a clean energy revolution to be the backbone of a stronger economy.

Green jobs are already helping the economy. Just yesterday, it was reported that sustainable building material company Serious Materials is trying to buy a traditional window factory that went bankrupt last December. The company wants to rehire 300 workers who were laid off and train them to build more efficient windows. Congress and the administration must support these efforts on a national scale. The stimulus greenbacks should yield green results for all.

A package focused on more efficient and renewable energy can result in greater labor intensity and higher wages than investing in oil production. This is not robbing Peter to pay Paul. An analysis by the University of Massachusetts-Amherst predicts a net increase in jobs if Congress supports expanding the renewable energy and energy efficiency industries.

The stimulus plan should reflect short-term and long-term benefits. Direct infusion to states and localities can kick-start economic and energy development. Energy efficiency and weatherization can be deployed immediately through existing skill sets and technology. Tax incentives and smart grid development can sustain a national network of long-term, permanent employees.

A green economy didn't get us into this mess—but it can get us out. The promise of a green economy can be met nationally, from hi-tech hubs to factory towns and wind farms on ranches. In this New Year, Congress must resolve to find a green economic tide that lifts all boats.

Some people may look forward to the New Year as a new start on old habits, but we cannot afford to overlook the opportunity to strengthen the economy by developing a globally competitive industry for renewable energy, restoring our failing infrastructure, and increasing environmental and energy security. This is one resolution we cannot and will not break.

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman. Let me first start out by apologizing that I am going to have to leave a little after 3:00 because I have a plane to catch to get back to Wisconsin. We are not really into the global warming bit, particularly today when the high temperature is scheduled to be minus 2, but nonetheless I am happy that the committee has been reauthorized and that we will be working on this issue in the next 2 years.

Despite having more than 50 hearings in the last Congress, the select committee never fully examined how legislative proposals to address global warming will truly affect the American economy. I think we are all for creating jobs, green jobs, brown jobs, purple jobs, any kind of jobs. But I think that we also have to recognize that there are consequences to whatever we do. And if a rising tide is to lift all boats, it shouldn't be up to the Congress or the Federal Government to pick winners and losers. We live in a market economy. It is the market that will pick the winners and the losers, and we should not deprive people of their right to earn a living to support their family and to have a comfortable and acceptable lifestyle simply because they happen to be on the politically incorrect side of today's equation. So we are going to have to look at what tradeoffs result from what we are dealing with here and what we are thinking of dealing with here.

I look at the stimulus proposal as something that can either be very good or very bad, and not in between. Let me say that we hear from our friends on the other side of the aisle that this is all good and nothing is bad at all. I want to put a couple of things on the table.

First of all, if all of this money is borrowed, we are going to have to pay it back sometime. And we are borrowing money in many cases from people who do not share our interests and values, like China and OPEC.

Secondly, we have to look at what happened in Japan in the decade of the 1990s where they had stimulus packages that were almost entirely public works oriented; and there were more jobs created while the money was being spent building a new bullet train line or a new freeway or new buildings or whatever, but as soon as that federal or national government money ran out in Japan, then they were right back from where they started. And most Japanese call the decade of the 1990s the lost decade. We Americans cannot afford to repeat that, and I am afraid we might be going down that road.

Now, finally, in terms of the whole issue of cap and tax——and that is what I call cap and trade, because the carbon credits that have to be bought are really a tax—we have got to be careful that the businesses that we are trying to help and the segments of the economy that we are trying to help with the stimulus package don't end up having to pay on the other end what we are trying to give them on one end.

For example, the concrete industry has a huge carbon footprint in it. Making concrete is probably more carbon emission intensive than driving your car between here and Philadelphia and back. And if we think we are creating jobs by improving our infrastructure, and a lot of that involves concrete, whether it is roads or bridges or buildings or things like that, we just have to make sure

that the government does not taketh away what it is giving with one hand.

So I think we are going to have to look at this all very carefully, and we are going to have to look at it beyond the boundaries of the four corners of the piece of legislation that we will be voting on in the next couple of weeks. If we do that and do that properly, we will be doing ourselves and the American people a great favor. If we don't do this properly, we are going to end up being asked to bail out more industries that we harm, either by sins of omission or sins of commission, and we are going to lose the accountability that we desperately need when the Federal Government appropriates a huge amount of money.

And the final point I want to make on this whole business is accountability is really the key. There was no accountability with the TARP that was passed in September; there was no accountability with the Katrina money that was spent. And, if we do not have much, much better accountability, then we in Congress are breaching the trust that the American taxpayers have given to us to spend their tax money wisely and to the best possible effect.

Thank you.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentleman from Oregon, Mr. Blumenauer.

Mr. BLUMENAUER. Thank you, Mr. Chairman. I appreciated the comments from my good friend from Wisconsin. I would take modest exception to the notion that we don't care whether these are green jobs or brown jobs, because I think it is very important that we do not use the economic stimulus, the investments that we are going to make, to create jobs of the past that are in fact brown or black or dirty, however you want to term that. And it is not just the invisible hand of the market that has created dirty jobs. Many of these efforts were deliberately subsidized by the Federal Government, by our policies in terms of energy, tax, public lands, to—whether it is coal or nuclear or inefficient transportation patterns or Federal policies that virtually dictated suburban sprawl that made a huge problem, for example, for the inner city for Philadelphia, while it was subsidizing their competition. The notion that it is the invisible hand that has worked against Detroit when our tax dollars have subsidized the establishment of modern foreign owned factories in other States, I beg to differ.

And I think, Mr. Chairman, part of what has been so important with this committee under your leadership is that for 2 years we have focused on what the security and economic provisions are.

Some of our witnesses are no stranger to the committee or other committees that I sit on. They have been helping us to be able to develop many of the elements of this plan I think are excellent. I think it can be better. I look forward to hearing the comments from the witnesses here and working with them and with the committee to continue to push those boundaries. We can refine the package not just for what it means today, but it sets a standard for what this Congress and the new administration are going to do over the course of 4 years with reauthorization, with budget. This starts the job; it doesn't finish it.

We need, however—and the distinguished ranking member is right on the money when he talks about how we are going to pay for these ultimately. Yes, we are going to stimulate. It would undercut our efforts if we would suddenly raise taxes and fees to pay for it now. But we are moving into an era where money does matter, and, again, creatively capturing, creating and capturing green value can help us finance this over time. And I look forward to working with the committee and especially our distinguished witnesses here today to be able to develop these boundaries.

Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman has expired. The Chair recognizes the gentleman from Arizona, Mr. Shadegg.

Mr. SHADEGG. Thank you, Mr. Chairman. I want to commend you for holding this hearing, and I want to thank you for the adoption of the rules and beg your forgiveness for my tardiness. I understand they passed unanimously, and I would have been happy to join in that. I am—given the restraint on opening statements which is occurring in other committees, I want to thank you for being generous in your allotment of time to opening statements in this committee, and hope it will continue to be the policy of this select committee, and I appreciate that very much.

I think this is an interesting topic, and I think it is good that we are having this kind of dialogue. For me, stimulating the economy is extremely important. It comes down to people losing their jobs and people being unemployed and people suffering, but there is an interface between the economy and the environment. I think as a nation we have learned that when we have done gratuitous damage to the environment, it has been economically ill-advised as well. But, by the same token, I think it is generally true across the globe that nations that are financially prosperous and successful and doing well are the nations best able to protect the environment. That is one of the reasons why I think looking at a stimulus package and looking at a green component of a stimulus package is an appropriate thing to do.

I was interviewed on the radio a week ago—actually, it was on a TV show, I think. And they wanted to know why I would not object to a green component of a stimulus package. I said, well, I think the Nation needs to be very concerned about its environment and needs to be looking at green issues, but we also need to look at those issues in the context of the economy. For example, I argue that there are things that we can do that both benefit the economy and benefit the environment. On, for example, the emission of greenhouse gases, I made a statement today in the Commerce Committee where I pointed out that there are things that we can do that have dual benefit, that both reduce greenhouse gases and also reduce our reliance on foreign energy. And relying on foreign energy is something that I think we have discovered is not good for the Nation.

So I am anxious to stimulate the economy. I am anxious to do so in a way which is environmentally sensitive. I don't think we can, using government money, spend our way out of the current economic troubles we are in, but I do believe that there are problems with our infrastructure in the country and that where we can look at projects that have both a stimulative value and a value that

benefits the economy, and particularly, for example, improving insulation in buildings, which will not only reduce greenhouse gases but also reduce our consumption of foreign oil, or we can make more efficient automobiles which will have those dual benefits, or where we can rely on renewables such as wind or solar, which will have that dual benefit, we should pursue those strategies first and foremost.

The CHAIRMAN. I thank the gentleman.

The Chair recognizes the gentleman from New York, Mr. Hall.

Mr. HALL. Thank you, Mr. Chairman, for holding this hearing, and thank you to our witnesses for being here today.

Our country is in a recession. Unemployment is on the rise, as are foreclosures. At the same time, the stock market is falling, wages are stagnating, and home prices are dropping as well, wiping out hard-earned equity for many families. So it is our responsibility to do whatever we can in the short term to stimulate the economy, but in doing so we should also make sure that our investments make sense in the long term and that they help solve the climate crisis.

I believe that we need an economic stimulus package, and that by focusing on green jobs and green infrastructure we can create even more jobs than if we simply invest in traditional public works. In fact, we have heard testimony from other panels that that is the case. And in fact, we have in the past, other Congresses have in the past selected winners or losers; for instance, by exempting certain kinds of vehicles from emissions or safety standards or by allowing extractive industries to take minerals out of public lands without paying a fair royalty.

Those are choices that are being made by government, and I think that we can make—we should either have a level playing field and not make choices like that, or we should try to favor those with the least environmental impact and most environmental benefit, such as renewable energy production, smart grid technology, energy efficiency, weatherization, which can not only create jobs but can have a multiplying effect, as my colleague Mr. Shadegg said, by saving consumers and businesses money on energy costs. And many weatherization projects are not so sophisticated as a highway or a bridge design. In fact, in my district we don't call them shovel ready, they are already screw driver ready. Many of the construction trades people who were laid off of work because of the downturn in housing could be hired immediately to start saving this energy and saving people the cost of heating or cooling their homes and have an immediate impact on our economy.

So these are good policy, economic, environmental policy, energy policy, and also for our sovereignty and our independence as a nation. I look forward to the testimony of our witnesses, and thank you again, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired. The Chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Thank you. I want to thank everybody for being here, especially Mr. Jones, whose brilliant book, Growing a Clean Economy, is just wonderful. And if you have a sleep problem, don't read it; you won't be able to go to sleep. Thanks for your great work.

I just want to point out, we are trying to maximize the amount of the renewable package that goes to energy. And the reason is, we want to have something that is quick but we want to have something that is enduring as well. And we know that the enduring job creation we are going to have is in green collar jobs. That is where the money is, that is where the jobs are. That is what is going to grow the economy for the next decade or two, not just for the next 60 days.

And we think we have got quite a number of unexplored options available to us. Some of us are going to continue to try to improve the amount that has been dedicated to these green jobs, both in building and retrofitting our buildings so they are more energy efficient, which are immediate things we can do, R&D, lithium ion batteries. Some say we can't do this right away.

I had a company, Johnson Controls, just leave my office an hour ago. They can have a lithium ion battery manufacturing plant built, in operation, by next December. That is fast enough, and it is an enduring contribution. We cannot allow—and if we don't put pedal to the metal in this renewable package, we are going to trade a dependence for Saudi Arabian oil for a dependence on Chinese lithium ion batteries. And that is why we are going to try to do as much as we can on this.

And thanks for all your testimony.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the former mayor of Kansas City, the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chairman. I appreciate the opportunity to be a part of this hearing, and thank you for calling it. Particularly, I got a chance to have some dialogue with a friend and mayor of Trenton, New Jersey. We served together during my terms as mayor of Kansas City, Doug Palmer. And of course Michael Nutter, who has already distinguished himself as mayor of Philadelphia. And as a former mayor, and my colleagues will tell you, at our meeting this morning every statement I made as we were talking about this package dealt more with issues with which mayors would be concerned, so much so that one of my members reminded me that I am the Fifth District Representative from Missouri in the United States Congress.

But I am concerned that we are going to spend some enormous amounts, as I think we are, in trying to go into public housing, for example, retrofit them so that they are energy efficient. All of that is good. The problem is whether or not we have a sufficient workforce trained to do that. And if we are supposed to be screwdriver ready, as my colleague said, if these projects must go in 90 days, I am really concerned that we are going to leave out a large number of people who would otherwise have an opportunity to work in this arena but are simply not trained in putting up solar panels. And there is a job component, a job training component, but here again if that job—and if there is some stuff that doesn't quite fit, I don't know how you can train people for a job that has to begin in 90 days. Because if it doesn't—my understanding is that if the jobs don't start in 90 days, particularly money going to the Governors, you use it or lose it.

So I am interested in some exchange, some information, some suggestions that you might have on those particular subjects. Thank you, Mr. Chairman. I yield back the balance of my time.

The CHAIRMAN. I thank the gentleman. The gentleman's time has expired.

The stimulus package is out. It has been announced, and the good news is that this committee is very pleased with what has been included in this sector. It reflects the 57 hearings that we had last year, it reflects the recommendations which we made with regard to what should be included in a stimulus package. There is $10 billion in the package to support wind energy; there is $4.5 billion for smart grid technology, which uses Internet technology, to make America smarter about energy use. There is $10 billion for grants to cities and States for efficiency programs. There is $6.2 billion for weatherization. As Mr. Inslee referred to, there is actually a program for $2 billion in here for advanced battery research as we move to this electric vehicle future.

So it is an excellent package. It starts to move us in the right direction off of energy dependence and towards the goal of solving the problem of climate change.

Our panel today is extremely distinguished, and it has a pedigree that is unmatched by any panel that we have had before us. And we begin by—first of all, although I am a Patriots fan, Mayor Nutter, we are all rooting for you in Philadelphia to win. You are not a Jets fan, are you, Mayor Palmer?

Mr. PALMER. Dallas Cowboys. At least I admitted it.

The CHAIRMAN. So all the more reason to welcome you, Mayor Nutter, to the panel. You are a great mayor of a great city. We welcome you. Whenever you are ready, please begin.

Mr. SHADEGG. A point of personal privilege. I just want to make sure that the "we all" doesn't include those of us from Arizona, who will be rooting for the Arizona Cardinals. Thank you, Mr. Chairman. I do appreciate your sensitivity, but it is important to me. I do need to get reelected back in Arizona, and I don't want the incorrect implication to arise.

The CHAIRMAN. And if I ever said "we all," then my mother is spinning in her grave somewhere.

Mr. SHADEGG. I appreciate that, Mr. Chairman. I am glad I have had this chance to set the record straight.

The CHAIRMAN. Mayor Nutter, whenever you are ready, please begin.

STATEMENT OF THE HON. MICHAEL A. NUTTER, MAYOR, CITY OF PHILADELPHIA

Mr. NUTTER. Good afternoon, Chairman Markey and Ranking Member Sensenbrenner, all members of this distinguished committee. Thank you very much for the opportunity to be with you this afternoon to give testimony.

I will address the three questions posed to the City of Philadelphia by the committee, but let me first preface all my responses with an overarching comment about the evolving stimulus package. We as policymakers have grown accustomed to thinking of cities as warehouses of great need. But in a transition to a carbon constrained economy, cities are now repositories of great value. Econo-

mists and engineers have demonstrated that energy efficiency is the most effective way to reduce our energy consumption. Cities are, if you will, the Saudi Arabia of energy efficiency. With our vast portfolios of existing buildings and infrastructure, cities are the best places to find this energy resource.

We are engaged in a great debate over an $800 billion package to forestall an unprecedented economic catastrophe; but if we are serious about spending the money quickly enough to stimulate the economy and wisely enough to maximize the life cycle benefits of those investments, then funding existing and scalable local projects is one key to that success.

Where this rubber meets the road is on the streets of Philadelphia and many other cities across America. It is therefore critical that Congress design a Federal stimulus package that allows money to flow directly to cities and to those local programs that will spend the money quickly and wisely.

Your first question was, how has the City of Philadelphia sought to strengthen its economy by reducing its impact on the environment? The City of Philadelphia has a long history of reaping the economic benefits of environmental stewardship of doing well by doing good, as our Quaker founders might say. While I could begin with that history, talking about William Penn's establishment of our green country town in 1682, of course I want to be very respectful of the committee's time today. So I will simply say that making Philadelphia the greenest city in America has become a hallmark challenge of my administration.

In April, we will be launching our ambitious action plan to reduce our exposure to rising energy prices, limit our environmental footprint, and reposition our workforce in economic development strategies to leverage our enormous competitive advantage in an emerging green economy. Indeed, the whole effort could be described as strengthening our economy by reducing our environmental impact.

Your second question posed: Specifically, how does storm water management affect cities and the environment? Two hundred years ago, Philadelphia was famous for many things, one of which was our water system. I am proud to say today that admiration for the Philadelphia Water Department, which has responsibility for our storm water management system, has only grown over the centuries. Cities such as New York and Boston, Washington, Milwaukee, and Philadelphia are spending billions of dollars to expand their storm water management systems to meet the requirements of the Clean Water Act of 1977.

The traditional gray infrastructure approach to storm water management means building bigger and very expensive pipes buried in tunnels. That approach further disrupts the natural water cycle, effectively wasting the resource of the rainwater. Today, there are new approaches being pioneered by cities like Philadelphia to use nontraditional green infrastructure approaches to limit the negative impacts of past storm water management practices. These approaches, which have capital costs somewhat similar to gray infrastructure, all attempt to use the landscape itself to manage storm water, and are outlined in greater detail in my written testimony that was submitted.

Your third question: What policy that is likely to be included in a stimulus package would help Philadelphia and other cities rebound from a weak economy? In answering this question, I focused my testimony on local investments that we believe quickly increase employment by simply scaling up existing local programs and capacities. We organize these investments into two broad categories, a building retrofit program and a green infrastructure program.

First, the retrofit program. There are enormous potential returns to energy saving investments in building retrofits, but the challenge is in designing effective programs. Building retrofits may be self-financing, but they are not self-implementing. They require both startup capital and effective delivery programs.

The City of Philadelphia currently spends $19 million annually on housing preservation and weatherization, $11 million of which are supported by the CDBG program. These funds are used to provide weatherization improvements such as attic and wall insulation, window sealing and replacement, and upgraded heating equipment. We currently conduct some degree of weatherization in about 5,000 homes a year. How large can such an effort really be in Philadelphia? This work is truly caulk gun ready and could happen as quickly as funds are available.

There are approximately 400,000 row houses in the City of Philadelphia. Using the estimates cited in my written testimony, we could raise the energy efficiency of, say, a quarter of those row houses by 20 percent. Examples are insulation, air-sealing, cool roofs, and so on. By investing $250 million over 2 years, 50,000 projects would directly employ at least 1,000 people full time over the course of a year.

The kind of weatherization proposal in the above example, insulation, air-sealing, cool roofs, typically has a simple payback in lower energy bills of about 2 years. In Philadelphia, we propose to use that payback to replenish the original $250 million; we propose to use that payback—with the replenished funds we could weatherize every row house in Philadelphia in less than a decade, harvesting a huge return in reduced energy consumption and greenhouse gas emissions.

Capitalizing this effort with stimulus dollars that could be leveraged by other sources and used to create a revolving fund is critical to conducting building retrofits at a scale under current financial conditions.

Now, a few words on the green infrastructure program. We want to deploy green space as a public utility by placing thousands of new trees on city streets; increasing the amount of green open space; using pervious pavement on parking lots and playgrounds; and building green roofs and bioswales. We can use green to supplement pipes.

In the long run, green infrastructure investments are much more sustainable as an adaptive approach to climate change and sea level rise. In the short term, they improve air quality and lower the incidence of heat stress, support walkable streets, with bicycle and transit options, and provide access to outdoor amenities and fresh locally grown food.

And, finally, investing in green infrastructure technologies also makes us more competitive by growing our position in new green technologies and job skills.

Philadelphia has an extensive catalog of green infrastructure projects that we have demonstrated in neighborhoods all across the city, from green streets to city farms. We have over $100 million worth of green infrastructure projects capable of producing benefits in terms of water, air quality, family sustaining employment, and more equitable access to healthy environments and food. But the current downward financial spiral is preventing us from making these investments. Providing stimulus funds for this innovative green infrastructure approach is critical to the City of Philadelphia realizing these benefits over the foreseeable future.

In conclusion, Mr. Chairman, ranking member, and members of the committee, a $250 million building retrofit program in Philadelphia would be consistent with the creation of a $50 billion national program. A $100 million green infrastructure program in a city like Philadelphia is consistent with the creation of a $20 billion national program. This is less than 10 percent of an $800 billion stimulus package, 10 percent focused on effective local programs that create jobs while improving the environment.

Mr. Chairman, ranking member, members of the committee, thank you very much.

[The statement of Mr. Nutter follows:]

Testimony before House Select Committee on
Energy Independence and Global Warming

Hearing on "Reinvigorating the Economy through Stimulus Legislation: Opportunities for All"

January 15, 2009

Honorable Michael A. Nutter
Mayor, City of Philadelphia

Dear Chairman Markey, Ranking Member Sensenbrenner, and Members of the Committee:

Thank you for the opportunity to testify today before the Select Committee on "how the Obama Administration's proposed stimulus package can benefit the environment and serve as a tool for widespread job growth and economic development." In my testimony, I will address the three questions posed to the City of Philadelphia by the committee:

1. **How has the City of Philadelphia sought to strengthen its economy by reducing its impact on the environment?**
2. **Specifically, how does storm water affect cities and the environment? What economic policies would help mitigate storm water damage in a surrounding watershed?**
3. **What policies likely to be included in a stimulus package (based on media reports and speeches by President-elect Obama) would help Philadelphia and other cities rebound from a weak economy?**

Before I turn to these important questions, let me preface our responses with an over-arching comment about the evolving stimulus package.

We as policymakers have grown accustomed to thinking of cities as warehouses of great need. But in the transition to a carbon-constrained economy, cities are now repositories of great value. Economists and engineers have repeatedly demonstrated that energy efficiency is the most cost effective way to reduce our energy consumption. The Alliance to Save Energy calculates that without the gains achieved in energy efficiency over the last 25 years we would

consume 50% more energy in the United States than we do today. And studies by McKinsey & Company, the Rocky Mountain Institute, the U.S. Chamber of Commerce, the Natural Resources Defense Council, and on and on, all find that existing efficiency technology could further reduce our energy consumption by another 20 to 50 percent.

Cities are, if you will, the "Saudi Arabia" of energy efficiency. With our vast portfolios of existing buildings (which account for two-thirds of the nation's energy consumption) and existing infrastructure, cities are the best place to find this efficiency resource. We are engaged in a great debate over an $800 billion package to forestall an unprecedented economic catastrophe. But if we are serious about spending that money *quickly enough* to stimulate the economy and *wisely enough* to maximize the lifecycle benefits of those investments, then existing local projects and the capacity to actually implement them are the keys to success. Where this rubber hits the road is on the streets of Philadelphia and other cities.

It is therefore critical that Congress design a federal stimulus package that allows money *to flow directly to cities and those local programs that will spend that money quickly and wisely.*

1. How has the City of Philadelphia sought to strengthen its economy by reducing its impact on the environment?

The City of Philadelphia has a long history of reaping the economic benefits of environmental stewardship—of doing well by doing good, as our Quaker founders might say. Indeed, I could begin that history with William Penn's establishment of his "green countrie towne" in 1682. But I'll confine myself here to a sample of efforts from the past decade alone.

In 1997, Philadelphia became the first major U.S. city to widely deploy LED (light emitting diode) in our traffic lights. Our Streets Department replaced all of our red traffic signals, red being the only color available at the time. We estimate that the accumulated savings between FY1998 and FY 2008 attributable to the low-energy red LED signals is equal to $8.4 million. In addition, we avoid over 8 million kilowatt hours (kWh) of electricity use every year and over 4 million tons of Green House Gas (GHG) emissions every year. We are attempting to finance

the re-lamping of all three colors at all 27,000 of our traffic signal heads. But this is a very challenging market in which to finance large projects. *If we had that financing, we could begin this project tomorrow.*

In 2003, we initiated a program to manage municipal energy through procurement, construction, and facility management. Between FY2003 and FY2008, our energy use in municipal buildings has been reduced by 12% across all sources (electricity, natural gas, steam, fuel oil.) Through that reduction, we have avoided energy costs of approximately $4.6 million for our buildings. But because energy prices rose so dramatically during this period, our total energy bill continued to climb despite our reduced usage. Between FY2003 and FY2008, our energy costs for our municipal buildings increased about 16% to almost $35 million per year. Including our airport and water energy usage, our fleet fuel, and our unmetered usage for things like street lights and traffic signals, our annual energy costs approach $100 million. As I will elaborate below, *we must do much more to control our energy costs.*

In 2004, Philadelphia designed a fleet reduction program that was widely celebrated, including recognition by the Kennedy School's Innovation in Government Awards. We reduced the size of municipal fleet by 330 vehicles by creating transportation alternatives that maximized economic returns while reducing environmental impact. The key program's element was contracting with the nonprofit Philly CarShare and the for-profit ZipCar to provide vehicles for City employees. *Philadelphia now has the largest government car sharing program in the nation and we continue to reduce and reconfigure our municipal fleet.*

In 2008, we became the largest city on the east coast with single-stream recycling and now have curbside weekly service throughout our city. This simplified approach has already had a dramatic effect on our recycling rate, which we expect to triple by the end of this year. The current collapse in the recycling market has not deterred us from pursuing the economic and environmental benefits from the program. In the last quarter of 2008, we were paid $44 per ton for our recycled material. This quarter, we expect to pay $32 per ton. While that is disappointing, it is important to note that paying $32 per ton is still cheaper than the $63 per ton we would have to pay to send the material to landfill. *Even when it doesn't make money, the green option avoids costs.*

Also in 2008, we installed a new solar hot water system at our Riverside Correctional Facility. The boilers that provide hot water to the facility needed to be replaced this year. After calculating the payback, we decided to add a solar powered heat exchange system that will provide the primary source of hot water, using gas or oil just as a backup system. 45 Solar Panels were installed on the roof and they heat a material similar to antifreeze to 265° Fahrenheit. The heated solution is pumped through coils in well-insulated hot water tanks and the heat exchange produces hot water for bathing, laundry, and cleaning. The additional cost of the solar heating system is expected to pay for itself through lower energy costs in less than 9 years. The system's designed lifespan is 25 years, which means for two-thirds of its expected life the system will provide hot water at zero energy cost. Over its useful life the solar system will save over $1 million dollars and reduce emissions by over one million pounds of CO2. *We have acres and acres of public rooftops in Philadelphia, from schools to water treatment facilities, which could support similar installations. But we need the financial resources to help pay for these strategic investments.*

And just this month, the City of Philadelphia went to market for the first time to request proposals from Energy Service Companies (ESCOs) to design and implement energy performance contracts for our City Hall and three largest municipal offices buildings. By making use of Pennsylvania's model legislation, the Guaranteed Energy Savings Act, we can take advantage of the kind of design/build procurement contracting normally available only to private sector property managers. The City of Philadelphia spends over $5 million per year on energy to operate these four buildings. Using industry standards, we expect to reduce that amount by at least $1 million per year and use those saving to finance the approximately $5 million cost of the capital improvements needed to reduce energy usage. It remains to be seen how successfully we will be able to finance this work under current market conditions. *Capitalizing the large-scale and self-financing retrofit of public and private buildings is a key opportunity of the stimulus bill.*

Making Philadelphia the "greenest city in America" is a hallmark challenge of my administration. During our just-completed first year in office, we have created a new cabinet-level Office of Sustainability and established a 21-member Sustainability Advisory Board representing public, private, and nonprofit interests

from across our metropolitan area. In April, we will be launching our ambitious action plan to reduce our exposure to rising energy prices, limit our environmental footprint, and reposition our workforce and economic development strategies to leverage our enormous competitive advantages in the emerging green economy. *Indeed, the whole effort could be described as "strengthening our economy by reducing our environmental impact."*

2. Specifically, how does storm water affect cities and the environment? What economic policies would help mitigate storm water damage in a surrounding watershed?

Two hundred years ago, Philadelphia was famous for many things, one of which was our Water System. It is with enormous pride that I can say the Philadelphia Water Department, which has responsibility for our storm water management, has grown even more widely admired over the centuries.

Managing stormwater is a basic service of government. If not controlled and managed, rainfall in urban centers results in overland flooding, basement sewer backups, areas of stagnant waters, and/or significant erosion. Left uncontrolled, urban stormwater can cause destruction of property, human disease, and the loss of aquatic and terrestrial habitat.

Our 19th and 20th century solution to stormwater management was to construct a network of drainage pipes which effectively move the rainwater, along with other industrial, household and human wastes away from homes, streets and businesses and into our rivers and streams for disposal.

The Clean Water Act of 1977 started a program of significant national and local investment to capture and treat this piped waste before it enters our water resources. This has been an extremely successful national program in all respects. Except that many times, when it rains, the volume of water that needs to be removed from our cities greatly exceeds the carrying capacity of our pipes. So, overflows of rainwater, sewage and industrial wastes still occur under most rain events in most cities in the United States—put simply, during rain events, solid waste mixes with storm run-off and enters our water supply. This problem has

been exacerbated by the build out of our cities, suburbs and rural areas. As more green space is paved over, the ability of the land to soak in the rainwater is diminished (causing more water to be carried by our sewer network). Changing climatic conditions – especially changes in the intensity and frequency of rain events—also contribute to increased storm overflow events.

The USEPA has a number of regulatory policies—especially two programs commonly called CSO National Policy and Stormwater Phase I & II Regulations—which are addressing these pollution concerns. *However, the cost associated with these programs will require Philadelphia and every major city and suburban county to spend many billions of dollars in new, expanded infrastructure to address these important environmental issues.*

Thus, cities such as New York, Chicago, Boston, Washington, Detroit, Milwaukee, Portland, and Philadelphia are spending billions of dollars to not only maintain their existing system of water and sewer pipes, but many tens of billions more to expand the stormwater system capacity to take in more stormwater. Often, these new systems make use of large underground storage tanks or tunnels to hold, treat and release these waters. In addition to the immediate concern over capital financing for these systems, the long term operation and maintenance and energy required for these systems make this approach unsustainable.

This traditional "big tunnel" or "grey infrastructure" approach to stormwater management also creates artificial boundaries to nature's water cycle—reducing groundwater infiltration (and thus groundwater tables and stream flows), habitat and vegetation (and thus the natural conditions of transpiration and evaporation), and creating an increased demand for imported water.

Today, there are new approaches being pioneered by cities like Philadelphia to use nontraditional, "green infrastructure" approaches to limit, and eventually reverse, the negative impacts of past stormwater management practices. These methods, which have capital costs similar to grey infrastructure, all attempt to use the landscape itself to manage stormwater. Here are some of our green infrastructure approaches to date:

- We have instituted some of the nation's strongest stormwater regulations that require developers to return land parcels to a condition much closer to how nature intended. This reduces the collective costs for managing stormwater in Philadelphia.

- We are instituting a "cost of service" stormwater charge which encourages land owners to use their properties in a sustainable manner—using pervious pavement in parking lots, carving out green space on the site, or planting trees, for example—or pay for the privilege of the City collecting their rain water waste for them.

- We have encouraged developers and property owners to use green infrastructure approaches like green roofs to meet their stormwater requirements. This guidance has already made Philadelphia # 2 in the nation's race to construct green roofs, behind our friendly rival Chicago, and nearly all of them have been created by the private sector.

- We have instituted a first-in-the-nation urban wetland's registry to help developers identify sites for remediation as a trade-off for water takings or wetland losses due to construction activities. This encourages the re-development of our industrialized riverfront properties by expediting an often arduous process with Federal agencies for wetlands protection. In addition, we have developed an evaluative tool to allow mitigation funds to be used to improve urban streams and wetlands in areas of the city often overlooked and underfunded for such activities.

- We have created best-in-nation regional and statewide partnerships to manage our water resources. We are working together with our up-state and out-of-state partners to limit the impact our individual plans and actions can have on the greater environment.

Yet, the Philadelphia Water Department, even with its excellent bond rating and comfortable margin of debt capacity, is currently finding it difficult to secure capital funding for its existing and on-going programs, much less the new initiatives described below. When money does become available, it is more critical than ever to make sure that every dollar is leveraged to satisfy the myriad of issues facing an urban water utility. *Support for storm water management*

along the lines discussed here is a powerful way to green our infrastructure investments.

3. What policies likely to be included in a stimulus package (based on media reports and speeches by President-elect Obama) would help Philadelphia and other cities rebound from a weak economy?

In answering this question, I focus my testimony on local investments that we believe would quickly increase employment by simply scaling up existing local programs and capacities. We organize these investments into two broad categories: a Building Retrofit Program and a Green Infrastructure Program.

Philadelphia's Building Retrofit Program to Increase Energy Efficiency

There are enormous potential returns to energy-saving investments in building retrofits: the debt incurred to fund the improvements is quickly liquidated in the stream of savings from reduced energy operating costs. But the challenge is in designing the program instruments capable of achieving these savings in the real world of homeowners and other property managers. Building retrofits may be self-financing but they are not self-implementing.

In his September testimony before this Select Committee, Professor Robert Pollin outlined the importance of building retrofits in any stimulus program:

> "This green economic recovery program would pay for itself relatively rapidly at the macroeconomic level through returns on energy efficiency in both the public and private sectors... The most obvious option for rapid green investment in communities is a large scale building retrofit program, which would rely entirely on known technologies...Retrofitting can begin almost immediately on buildings of all sizes, in all regions of the country, and can provide short-term returns on the money being invested... For the average U.S. homeowner, the Department of Energy has found that a $2,500 investment in home retrofitting can reduce average annual energy consumption by 30 percent. As of 2006, the average household income was around $60,000, and the average household spends about five percent of its income on household energy consumption. The five percent of total

income going to energy amounts to $3,000 per year. A saving of 30 percent of that $3,000 total household energy bill would therefore amount to $900 per year."

The City of Philadelphia currently spends $19 million annually on Housing Preservation and Weatherization, $11 million of which is supported by CDBG funds. Administered by the Philadelphia Housing Development Corporation, these funds may be used to provide traditional weatherization improvements, such as attic and wall insulation, window sealing and replacement, and upgraded heating equipment. In addition to basic systems repair, these funds also support emergency repairs and utility payments. The weatherization component of these programs support about 3600 projects per year and could be quickly scaled up with additional funding because the skills requirements for weatherization specialists are relatively easy to attain.

An expanded weatherization program could become part of a pipeline to retool Philadelphia's workforce to meet growing demand in the private market for home weatherization. As increasing numbers of banks and energy service companies offer specialized loans to help homeowners make energy upgrades to their houses, new demand for these services is expected to create new positions for certified weatherization specialists within the next two years. A new job training program developed by the Energy Coordinating Agency will certify new weatherization specialists. Some of this training can be completed in as little as two weeks, allowing unemployed or underemployed Philadelphians to transition rapidly into a sector with tremendous opportunity. The total number of trainees, including auditors and installers and other related positions, is expected to be over 800 in the first two years of operation.

It is very important to look at the ECA job training project and others in the national context of the growing, green collar jobs movement. A major new report from the American Council for an Energy-Efficient Economy (ACEEE) states that energy efficiency remains the most invisible and the least understood strategy for energy independence: "We have only begun to scratch the surface of the potential savings that additional investments in energy efficiency technologies could provide. While current investments in energy efficiency are having an

important impact on our economy, efficiency remains under-funded, and the potential benefits of efficiency remain unrealized."

Energy efficiency not only offsets more greenhouse gas emissions than renewables and alternative fuels, it generates significant numbers of domestic jobs. According to ACEEE, "In 2004, an estimated $300 billion, 60% of which was in the buildings sector, was invested in energy efficiency technologies and infrastructure in the United States and those investments made us more productive, saved us money, and supported 1.6 million jobs."

The work of creating a clean energy economy is very labor intensive. These new, green collar jobs require building science, carpentry, electrical, plumbing, sales, and communications skills. These jobs include: insulators, carpenters, heating technicians, energy auditors, and educators, as well as support services, sales, and manufacturing. The good news is that these jobs are a perfect fit for Philadelphia's workforce, and are not transferable overseas. Rather than being dead-end, minimum wage jobs, these are jobs with a bright future that provide access to a continuum of advancement and opportunity.

For example, one of Philadelphia's major building retrofit providers, the Energy Coordinating Agency, hires high school graduates at a starting rate of $12/hour plus full benefits. The average salary of their weatherization field staff is $35-40,000/year. Supervisors make more than that average. Salary increases and promotions are increasingly tied to training. For example, the Building Performance Institute certification (an industry standard) translates into a salary increase. ECA is now in the process of having all our inspectors, auditors and supervisors trained and supervised through BPI.

How large could such an effort be in Philadelphia? There are approximately 400,000 rowhouses in our city. Using the estimates cited above, we could raise the energy efficiency of, say, a quarter of these rowhouses by 20-30% (with insulation, air-sealing, cool roofs, and so on) by investing $2500 x 100,000, or $250 million, over two years. That $250 million is Philadelphia's population-based share of a $50 billion building retrofit program, which seems appropriate for an $800 billion stimulus package. Under our current publicly funded weatherization program, a two-person team of auditors can first survey and later verify a typical

project in two half-day sessions and a three-person crew can complete a typical project in one day. Thus, 250 projects would fully occupy five persons over the course of a year, and 50,000 projects would employ at least 1000 people full-time over the course of a year.

At this point, let me emphasize the self-financing aspect of energy efficiency. The stream of savings means that an initial capitalization can be replenished and used to continue the work. The kind of weatherization proposed in the above example (insulation, air sealing, cool roofs) typically has a simple payback of two to three years. In other words, the savings in reduced energy bills will exceed the upfront cost of the improvements in as little as two years, especially when combined with other incentives such as rebates from utilities and tax benefits. In Philadelphia, we propose to use those savings to replenish the original $250 million. Homeowners would have no out-of-pocket costs for the improvements and use the energy savings to pay for improvements. After the payback period, homeowners would get to keep all of the savings from their lower energy bills. With a replenished fund, we could move on the next 100,000 homes. Under the scenario outlined here, we could weatherize every rowhouse in Philadelphia in less than a decade, harvesting a huge return in reduced energy consumption and greenhouse gas emissions.

In order to maximize the benefits of this large-scale residential retrofit program, Philadelphia would like to create a Municipal Energy Authority with the power to organize investments using a whole house approach (that is, making investments that save electricity as well as natural gas); to bundle investments across large groups of beneficiaries; to lower financing costs by using existing payment instruments (such as property tax bills), and eventually to finance these efforts in the municipal bond market. Such a Municipal Energy Authority could pursue the public interest in conservation through energy efficiency much more aggressively than public utilities whose revenues are not fully decoupled from volume. This approach could work well at a metropolitan scale and we are in active discussions with our county partners to work across city-suburban jurisdictions. *Capitalizing the new Municipal Energy Authority with stimulus dollars that could be leveraged by other sources and used to create a revolving fund is critical to conducting building retrofits at scale under current financial conditions.*

Philadelphia's Green Infrastructure Program

The basic principles underlying Philadelphia's green infrastructure strategy are to (1) value rainwater where it lands—through recycle, re-use, recharge—rather than pipe it away from man and nature; (2) maintain and upgrade existing grey infrastructure as a back-up to nature's role of water management; (3) rebuild our rivers and streams to transform them into destinations and green open space for our citizens; and (4) collaborate with our communities and partners to build neighborhoods with improved air quality and lower incidents of heat stress, walkable streets with bicycle and cleaner public transit options, and access to outdoor amenities and fresh locally grown food.

We plan to deploy green space as a public utility by placing thousands of new trees on city streets; increasing the amount of green open space; using pervious pavement on parking lots and playgrounds; building green roofs; and distributing rainwater collection barrels to homeowners. In addition, green infrastructure investments are much more sustainable when we consider their potential as an adaptive approach to climate change and sea level rise. Indeed, investing in new green infrastructure technologies make us more competitive. Green infrastructure demands investments in new green technologies and job skills. *Estimates made for Philadelphia of the value of the environmental, social and direct economic benefits of green storm water infrastructure indicate that there is a dollar-for-dollar return on investment.*

Here are six of Philadelphia's green infrastructure projects that could be started immediately, with adequate funding:

Waterway Restoration: We have a scalable program (up to $9 million ready to go) to transform waterways such as Cobbs Creek in West Philadelphia and the Tacony Creek in the lower Northeast section of Philadelphia into new "green destinations" in urban areas that link parks and recreation, transportation, biking, jogging, fishing, environmental education, green jobs and a sense of long lost environmental justice for poor, often neglected urban areas.

Green Streets: A second scalable program (up to $2 million ready to go) is our Green Streets program that involves a variety of approaches for all types of streets, from fairly simple strategies like increasing tree cover to more ambitious

redesigns that include the use of vegetated sidewalk planters and bump-outs and underground infiltration areas developed in adjacent lands. Over time, this new "green standard" for city streets will touch every neighborhood in a city and result in a completely new urban form requiring $100s of millions in new investment.

Green Corridors: A South Philadelphia main street, the West Passyunk Avenue Business Corridor is home to dozens of small businesses and tens of thousands of residents. We have a $6 million project ready to implement that would create 100 jobs by this time next year installing green sidewalks that are landscaped to manage storm water, improved new traffic signals to reduce air pollution caused by congestion, and new energy efficient street lights. This project is a triple win: creating construction jobs, rehabilitating infrastructure that serves small business, and improving air and water quality.

Green Farms: Philadelphia has a program ready to go that will use vacant city parcels to test models of urban farming as an interim use for vacant land. The program will cultivate profitable urban commercial agriculture operation (produce, green-roof sedum, trees, etc) through the efforts of entrepreneurial farmers using diverse agricultural techniques. The City of Philadelphia and the Redevelopment Authority will engage successful urban farmers for potential business expansion and as a source of technical assistance for new farmers. The objective is to have several commercial farms clustered on vacant parcels as an interim use by 2010. A major part of the project will use temporary greenhouse structures to grow three categories of products: (1) foodstuff needed by inner-city residents who have no easy access to fresh produce; (2) materials for green roofs, which currently have to be imported from other states, and (3) flowers that can be sold. It can be expanded to incorporate a workforce training component for ex-offenders.

Green Parcels: The City of Philadelphia, working with the Pennsylvania Horticultural Society and neighborhood based organizations, has developed a 'Clean and Green" vacant land management program that has created jobs and demonstrably improved the quality of life and the value of property in every neighborhood in which it operates. It is estimated that Philadelphia has 30-40,000 vacant lots, most of which have been abandoned by their owners and left to grow weeds and accumulate trash. This effort is already underway; in 2008 it treated

more than 7100 parcels of ground at a cost of roughly $4.2 million. This program can quickly be scaled up using relatively low skilled labor and small contractors, generating both jobs and tangible benefits through cleaner neighborhoods and higher property values. An investment of $10 million would clean and green an additional 17,000 parcels, generating more than 500 jobs and stabilizing property values throughout the City.

Greener Transit: One of the great advantages of dense city neighborhoods is the support they provide to sustainable transit systems, with high levels of ridership and destinations. The Philadelphia metropolitan region is served by one of the nation's most extensive transit systems and SEPTA, our regional public transit authority is aggressively positioning itself as a key element of the region's competitive advantage as an energy-efficient place to live and work. SEPTA has an existing contract option to purchase 20 hybrid (diesel/electric) buses in each of the next two years. This option would cost about $18 million and generate an estimated 678 jobs (nationwide).

The City of Philadelphia has over $100 million dollars worth of projects, these and many others we have provided in other forums, that would produce green infrastructure capable of producing benefits in terms of water and air quality, family-sustaining employment, and more equitable access to healthy environments and food. But the current downward financial spiral is preventing us from making these investments. *Providing stimulus funds for this innovative green infrastructure approach is critical to allow the City of Philadelphia to realize these benefits over the foreseeable future.*

Conclusion

Thank you again for the opportunity to testify on this important issue. As I hope the Philadelphia story has convincingly demonstrated, cities are the place and local programs are the means for spending dollars quickly enough to stimulate the economy now and wisely enough to transform the economy into a more prosperous future.

The CHAIRMAN. Thank you, Mayor Nutter, very much.

Our next witness is the Honorable Douglas Palmer, the mayor of the City of Trenton. He has served four terms in office. He has been a champion of working families. He has also received the Phoenix Award by becoming a national leader on brownfields development, and he recently completed a 2-year term as the President of the U.S. Conference of Mayors.

Welcome, Mayor Palmer. Whenever you are ready, please begin.

STATEMENT OF THE HON. DOUGLAS PALMER, MAYOR, CITY OF TRENTON

Mr. PALMER. Thank you, Mr. Chairman and members of the committee. It is a pleasure to be here with this very distinguished panel and my good friend and neighbor, Michael Nutter. It is also good to see former Mayor Cleaver. But once you are a mayor, you are always a mayor.

I really want to thank you for the opportunity to appear today on behalf of the United States Conference of Mayors, who represent 1,200 U.S. cities. And also on behalf of the Nation's mayors, we also want to express our deep appreciation to the committee, especially you, Mr. Chairman, and Ranking Member Sensenbrenner, for holding a field hearing, as you remember, at our meeting in Seattle, Washington. And it was very fruitful.

At that time, I was pleased to participate in this hearing to discuss the mayors' energy and climate efforts, and most notably our call for enactment of the Energy Efficiency and Conservation Block Grant Program, which is a top priority of the Nation's mayors for the economic recovery package.

Immediately following your hearing, Congress enacted the EECBG program as part of the Energy Independence and Security Act of 2007, and thanks to your leadership, Mr. Chairman, members of this committee, and others throughout the Congress. Since that time, the Nation's mayors, through the Conference of Mayors, joined by the National League of Cities and National Association of Counties, has spent many months urging Congress to fund this program so that we can accelerate our Nation's efforts through community-based investments and other initiatives to grow green jobs and a greener economy.

Mr. Chairman, also, we are pleased that the House of Representatives today released an outline of its American Recovery and Reinvestment Plan, and that plan includes $6.9 billion to help State and local governments make investments that make them more energy efficient and reduce their carbon footprint.

Mr. Chairman, you asked for testimony on three priority concerns: How has the economic downturn affected cities' efforts to meet fiscal and environmental goals? Can a green economic recovery package create jobs and stimulate the economy? And, how should stimulus funds between States and cities be allocated?

The reality at the local level is the economic downturn is having a profound effect on our fiscal and environmental goals. We strongly believe that there is evidence that supports this; that the economic recovery plan can create jobs and stimulate the economy while providing significant environmental benefits for local areas.

Mr. Chairman, and members of the committee, our Nation's cities and their metro areas are the engines of our national economy. Our 363 metro areas are home to 86 percent of U.S. employment, over 90 percent of wage income, and nearly 90 percent of our gross domestic product. Therefore, without the economic recovery of our cities and metros, there can be no U.S. recovery.

We are going to release at our conference meeting this week a forecast of metro unemployment for 2009, which was prepared by Global Insight, and of course it is no secret the news will not be good. Almost all metros will see significant job declines in 2009, and an amazing number of our metro economies will experience no employment gains for the decade. And with your permission, I would like to add that report to the record.

The CHAIRMAN. Without objection, it will be included in the record.

Mr. PALMER. Complement this jobless picture with a significant loss in our tax base due to falling real estate prices, which you mentioned as a part of the foreclosure issue, and cities are left with almost no fiscal capacity to expand existing or start new initiatives on climate protection, energy efficiency, and energy independence, areas that are absolutely essential to building a competitive economy for the future.

I want to move a little forward and talk about economic recovery plan, job stimulus, and local environmental goals. You know, mayors have been consistent in our views about the opportunity and necessity to put this Nation on a path to a green economy. This has certainly been a central theme of the mayors' advocacy of the conference's Main Street Economic Recovery Plan, which I will be glad to answer questions later, first released in early November. The Nation's mayors have been urging Congress and the new administration to make a strong commitment to Main Street-oriented investments that will create jobs and reinvigorate the economy.

Mr. Chairman, to support this Main Street recovery plan, we are continually surveying our mayors on investments that can immediately stimulate job creation from completed projects before the end of 2010. This weekend we will release an updated survey of ready-to-go projects that illustrate the variety and range of investments that could be made in cities all across the country.

At our winter meeting, the conference will release its updated survey results based on responses from 779 cities, and one of course is in Phoenix, Arizona, just so you know, and Portland, and even in Wisconsin. We project that for each $1 billion in EECBG funding, about 10,000 local jobs in our cities would be created exclusive of the many other direct jobs in manufacturing and other direct and indirect jobs that will result.

These projects could include, as has been mentioned, energy retrofits of public and private buildings, installation of solar panels or wind turbines, deployment of new energy distribution technologies that significantly increase energy efficiency, and the development of systems to capture and generate power from methane at landfills.

Mr. Chairman, we also believe, in conclusion, that certainly through this formula one of the best ways to make sure that this money is done, as Mr. Sensenbrenner wants to see it is done, done

right, that there is competition. One of the best ways to do this and do it quickly is to put monies direct to cities. I love the States and I love the Governors, but I think if you want to see things happen right away, where the rubber meets the roads, are the Nation's mayors that have projects that are transparent. No bridges to nowhere. A lot of times, any monies we spend have to be through all kinds of public bidding as well as other kinds of things that are transparent. My citizens in Trenton, they won't allow me to put a bridge to nowhere. They would have my head. So we have the transparency. We can get the money out into our communities and our cities. And we suggest part of the monies that go, go direct to cities.

And I want to thank you for having the opportunity to be on this distinguished panel, and look forward to answering any questions.

[The statement of Mr. Palmer follows:]

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Testimony of
The Honorable Douglas H. Palmer
Mayor of Trenton, New Jersey

before
The Select Committee on
Energy Independence and Global Warming
U.S. House of Representatives

for the hearing on

"Green Jobs, Efficiency Opportunities in the Economic Stimulus Package: Creating Opportunities for All"

January 15, 2009

Mr. Chairman and Members of the Committee, I am Douglas Palmer, Mayor of Trenton and Past President of The United States Conference of Mayors. We thank you for this opportunity to appear today on behalf of The U. S. Conference of Mayors, the national organization of the nation's mayors who represent the more than 1,100 U.S. cities with a population of 30,000 or more.

On behalf of the nation's mayors, we also want to express our appreciation to the Committee, especially Chairman Markey and Ranking Member Sensenbrenner, for holding a field hearing with mayors during the Conference's Mayors Climate Protection Summit in Seattle, Washington. At that time, I was pleased to participate in this hearing to discuss the mayors' energy and climate efforts, most notably our call for enactment of the Energy Efficiency and Conservation Block Grant (EECBG) Program, which is a top priority of the nation's mayors for the economic recovery package.

Immediately following your hearing, Congress enacted the EECBG program as part of the *Energy Independence and Security Act of 2007*, thanks to your leadership, Mr. Chairman, and that of the Members of this Committee and others throughout the Congress.

Since that time, the nation's mayors through the Conference of Mayors, joined by the National League of Cities and National Association of Counties, have spent many months urging Congress to fund this program so we can accelerate our nation's efforts, through community-based investments and other initiatives, to grow green jobs and a greener economy. We strongly believe an EECBG funding commitment is most appropriate and timely for inclusion in the economic recovery plan that will soon be debated in this Congress.

Mr. Chairman, you asked for testimony today on these three priority concerns before the Congress:

1. ***How has the recent economic downturn affected cities' efforts to meet fiscal and environmental goals?***
2. ***Can a "green" economic recovery package create jobs and stimulate the economy while also generating environmental benefits for localities?***

3. How should stimulus funds between states and cities be allocated?

The reality at the local level is the economic downturn is having profound effects on our fiscal and environmental goals.

We strongly believe, and there is evidence that supports this, that the economic recovery plan can create jobs and stimulate the economy, while providing significant environmental benefits for local areas.

And, by design, the EECBG program resolves questions about states versus localities by offering a balanced approach to the distribution of funds between states and cities and counties, building upon a proven federal delivery system that HUD has used for three decades to assist local and state community development efforts.

Economic Downturn and Impacts on Local Fiscal & Environmental Goals

Mr. Chairman, our nation's cities and their metro areas are the engines of our national economy. Our 363 metro areas are home to 86% of U.S. employment, over 90% of wage income and nearly 90% of our gross domestic product.

Therefore, without the economic recovery of our cities and metros, there can be no U.S. recovery.

Unfortunately, our cities and these larger metro economies are facing the brunt of the current economic downturn. This weekend, the Conference at its Winter Meeting will release a forecast of metro unemployment for 2009, prepared by Global Insight.

The news will not be good. Almost all metros will see significant job declines in 2009, and an amazing number of our metro economies will experience no employment gains for the decade. With your permission, I would like to enter this report for the record of the hearing after its release.

Couple this jobless picture with a significant loss in our tax base due to falling real estate prices, and cities are left with almost no fiscal capacity to expand existing ... or start new ... initiatives on climate protection, energy efficiency and energy independence, areas that are absolutely essential to building a competitive economy for the future.

One statistic bears this out. In 2008 alone, we estimate that home values will have dropped 8.8% or $1.73 trillion. This unprecedented decline, coming after years of steady growth in real estate values, has been especially disruptive to cities and other local government finances. Consider that about one half of all local government revenues are linked in some way to real estate, whether it is valuations for local property taxes to revenues and fees from real estate transactions.

Compounding this dire situation is the fact that many state governments are cutting or eliminating general aid and other programs to cities and local governments that we have traditionally relied upon to deliver basic services.

In my many years of service in local elected office, mostly as Mayor of Trenton, I have never seen anything that comes close to approximating the fiscal conditions my city is now facing. Foreclosures are at record levels, local revenues are down substantially, and looming state budget cuts are at unprecedented levels.

More than one year ago, I set forth my "Trenton Green" initiative to put my city on a path to green collar careers, new green jobs and a greener economy. We went to work on a number of energy conservation, energy efficiency and renewable energy production initiatives, with a particular emphasis on developing green collar careers for our citizens. It is an effort that reaches out broadly to our citizens and embraces new partnerships with the private sector, non-profit agencies, the local utility, state government and its agencies, and the federal government.

One year later, I am confronting unprecedented fiscal challenges, forcing the City to cut our workforce and the autonomous library to trim back its hours, among a broad array of tough decisions, all to align available revenues with future expenditures. There is no end in sight, and it is still getting worse. This means for my city, and so many others throughout the U.S., we are already losing ground on our current energy and climate initiatives, with the potential for even greater retrenchment in coming months.

Early last year, anticipating these conditions, I directed the Conference's Mayors Climate Protection Center to undertake a survey examining some of these fiscal challenges. Conducted in May 2008, nearly three in four mayors – at that time – were already reporting economic problems, specifically local revenue constraints, which were adversely affecting their financial commitments to local initiatives to help meet the goals set forth in the Mayors Climate Protection Agreement. This was the period of time during the run up in oil prices, notably gasoline and diesel fuel costs, that only pushed a weakening U.S. economy further into decline, reminding us of the critical need to reduce our dependency on foreign energy supplies by conserving and using our energy resources more efficiently and by shifting to greater reliance on renewable energy sources here in the U.S.

Especially relevant to the need for funding the energy block grant program in the economic recovery plan was the finding that 82 percent of cities reported that lack of resources was the single largest obstacle to making progress on their local energy and climate goals. These results were prior to the economic meltdown and job losses that we experienced throughout the fall of last year.

The bottom line, Mr. Chairman, is that we are in the midst of a perfect economic storm and we simply do not have the resources to maintain current services. New energy and climate programs that are in the near-term and long-term interest of the nation and are the key to our future prosperity are simply out of reach, unless we have energy block grant resources to help us build on the momentum that we have begun through the Mayors Climate Protection Agreement and other initiatives.

On the macro level, we project that 94% of our nation's economic growth will occur in our metro areas over the next 20 years, and we know that long-term productivity of recovery spending is greater when it is invested in locally-based projects and activities where economic growth will occur. Mr. Chairman, 85 percent of job losses during this recession will occur in our cities and their metro areas. Since these are the areas that have carried U.S. economic growth, this is an alarming development. As such, we need a National Recovery Plan that invests directly into these areas. Simply put, we need to create jobs where the unemployed are, and we can create jobs in green economy sectors through the energy block grant and other initiatives.

"Green" Economic Recovery Plan: Jobs, Stimulus & Local Environmental Goals

Mr. Chairman, mayors have been consistent in our views about the opportunity and the necessity to put this nation on a path to a green economy. The economic plan you develop can and must make the critical investments that will move the nation toward a greener economy. This has certainly been a central theme of the mayors' advocacy of the Conference's MainStreet Economic Recovery Plan.

First released in early November, the "ready-to-go" effort identified by the nation's mayors urges Congress and the new Administration to make a strong commitment to MainStreet-oriented investments that will create jobs and reinvigorate the economy, while moving the nation toward greater energy independence and reduced greenhouse gas emissions.

To accomplish this, our plan urges, where possible, the use of existing delivery systems – meaning those that already exist under current law. Our plan also urges you to focus resources on existing communities and critical sectors, including energy efficiency and key infrastructures.

Mr. Chairman, to support this MainStreet Recovery Plan, we are continually surveying our Mayors on investments that can immediately stimulate job creation from completed projects before the end of 2010. This weekend, we will release an updated survey of these "ready to

go" projects that illustrate the variety and range of investments that could be made in cities all across the country. Mr. Chairman, this is not an earmark list, rather it is a demonstration of the capacity of Mayors and their cities to aid in the nation's economic recovery through a myriad of investments.

Our earlier findings show that 942 projects have been identified in just these 427 cities for potential EECBG funding, resulting in a total investment of $6.2 billion and creating 38,732 jobs. This weekend, the Conference will release its updated survey results, based on responses from 779 cities.

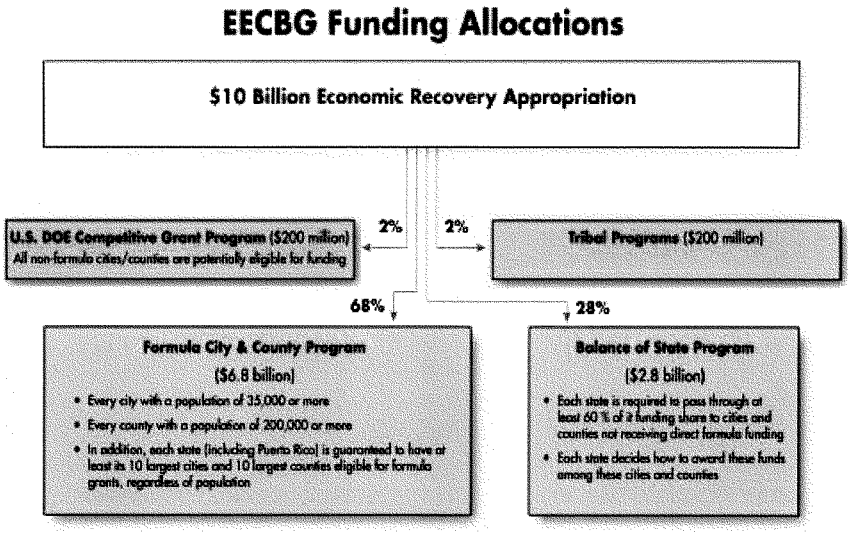
Based on this research, we project that for each $1 billion in EECBG funding, about 10,000 local jobs in our cities would be created, exclusive of the many other direct jobs in manufacturing and other direct and indirect jobs that will result.

These jobs, funded through the EECBG program, would be created in cities, counties, and throughout the states by investment in thousands of energy efficiency and renewable energy production projects. As provided by the law, these projects could include energy retrofits of public and private buildings in local areas, installation of solar panels or wind turbines for the production of electricity on local buildings, deployment of new energy distribution technologies (such as distributed generation or district heating and cooling systems) that significantly increase energy efficiency, and development of systems to capture and generate power from methane at landfills.

Allocation of Stimulus Funds between States and Cities

Mr. Chairman, we believe the Energy Efficiency and Conservation Block Grant Program, as enacted, provides a balanced allocation of funds among major cities and counties and their respective states, with particular protections for less populated states. This program was vetted in hearings and deliberations during the legislative debate on the last energy bill. The net result is a distribution of funds based on relative population shares, which we believe is fair

and balanced. Below is a graphic depiction of the distribution of these funds under the program as authorized in 2007.



Closing Comments

Mr. Chairman, the nation's mayors are "ready to go" with green energy efficiency and renewable projects that have both short- and long-term benefits. We know that the U.S. Department of Energy is now finalizing a policy guidance to distribute EECBG funds promptly and effectively, to ensure this program is ready to contribute to the nation's economic recovery.

On behalf of the nation's mayors, we thank you for this opportunity to testify today.

The CHAIRMAN. Thank you, Mayor Palmer, very much.

Our next witness, Van Jones, is the President of Green For All, and a Senior Fellow at the Center for American Progress. Mr. Jones also co-founded the Ella Baker Center for Human Rights and has received numerous awards, including being selected by Time Magazine last year as an environmental hero.

We welcome you back, Mr. Jones. Whenever you are ready, please begin.

STATEMENT OF VAN JONES, PRESIDENT, GREEN FOR ALL

Mr. JONES. Thank you. Good to be here.

Well, Mr. Chairman, other committee members, I am just happy to be here and I appreciate the opportunity to talk. I was here in 2007 when the term "green collar job" was very rarely heard anywhere. This may have been the first place it was heard in Congress, and now it is everywhere. And that reflects something. It reflects a hunger and a desire on the part of the American people to solve the two biggest crises possibly ever to face this country, an economic catastrophe and a climate crisis, both of which could undermine our Nation's security, our economy, not just now but for decades into the future.

You, unlike the rest of us, next week we are going to be celebrating; you will celebrate for about 10 minutes and then you are going back to sweating, sweating over the details of this recovery, sweating over the details of how it is that we can actually beat the recession and global warming at the same time.

The 111th Congress will be in the history books. A hundred years from now students will study this Congress, and they will ask one question: Were you able to solve the problem? Were you able to deal with this twin crisis? How did you do it? And you are going to get a grade from our great grandchildren, yes or no, pass or fail.

The reason that green jobs are so important is because they are the most secure way to ensure success for this Congress, because while on the one hand we are facing an economic catastrophe and on the other we are facing a climate crisis, what we have to keep in mind is that everything that is good in the fight against global warming, everything that is good for the environment is a job. It is a job. Solar panels do not put themselves up. Wind turbines do not manufacture themselves. Buildings do not retrofit themselves and weatherize themselves. And in our industrial society, trees don't even plant themselves. Everything that is good for the environment is in fact a job, and that is a key to a breakthrough.

What I want to implore is three things. Keep in mind as we go forward that sometimes—and you know this from your personal life—sometimes something really bad has to happen before something really good can happen. Sometimes you have to have a breakdown before you can have a breakthrough. You look at your personal life; that is true. It is not after you had a bunch of good days in a row that you say, hey, I need to go on a diet or make a big change. It is when you get a bad diagnosis from a doctor, it is when something awful happens. That is when you sit down and say, I have got to make a difference here, I have got to make a change.

Well, we just got a bad diagnosis, and the whole country now is looking for a change.

You have the opportunity to turn this breakdown into a breakthrough, and you can if you honor three principles: Number one, this is a chance for America finally to return to its roots as the most important economy in the world, not because we are the number one consumers, but because we are the number one producers.

Congressman Inslee pointed out that there is an opportunity to bring green manufacturing jobs back to this country making batteries, making wind turbines, doing those things in the United States. Let us seize the opportunity to abandon the idea that we can forever be the most important economy in the world based on consumption, based on consumerism, based on credit cards. Let's get back to building rather than borrowing in the United States. Number one.

Number two, as we honor Congressman Sensenbrenner's plea for accountability—and I will underscore that. We don't want to see any more wasted money. We can't afford it. We don't want to see any more of the Katrinas and those kinds of things. We can't afford it. But as we do that, let's make sure we get our math right. This is a green economy we are trying to build, and in a green economy the math is different. You don't just count what you spend, you count what you save. This is a key point: When you are building a green economy, you don't just count what you spend, you count what you save. And a massive investment, as the mayors are calling for, in energy efficiency will save us money over the long term. And that is the importance of the Energy Efficiency and Conservation Block Grant that the mayors have fought so valiantly for.

The third is simply this. We have an opportunity to do something that no generation of Americans has ever had the opportunity to do: We can build a green economy that Dr. King would be proud of. We have the opportunity to connect the people who most need work with the work that most needs to be done, and fight pollution and poverty at the same time, and be one country about it. We have a chance to slow up for just a second, as Congressman Cleaver said. We might have to delay 2 weeks to help some of the young men and young women that you represent to get a little bit more training to get involved. We might have to wait 3. We might have to hold up a month to get some of these young folks coming home from wars, coming home from prisons, coming out of high school, we might have to even wait an extra month to get them trained to become a part of this. But if we do that, we will have built a green wave that can lift all boats, we will have created green pathways out of poverty. We will show a new generation of Americans that we can stand together and do great things again, and that differences of color and class, starting point differences, don't matter, because we have a big future that we are trying to fight for together.

You as the leaders of the 111th Congress on this most pressing issue have the opportunity to make us the number one producer in the world, to change the math so we count what counts; we don't just count what we spend, we also count what we save, and to connect the people who most need work to the work that most needs

to be done. And if you do that, our great, great grandchildren will give you an A-plus.

Thank you very much.

[The statement of Mr. Jones follows:]

Van Jones, J.D.
President, Green For All
Oakland, California

Testimony before the Select Committee on
Energy Independence and Global Warming

Thursday, January 13, 2009

Opportunities For Green Growth: Myths & Realities About Green Jobs

Chairman Markey and members of the Committee, thank you for inviting me here today.

I am here representing Green For All, a national organization dedicated to helping to build an inclusive, green economy – strong enough to lift millions of people out of poverty.

I first testified before this esteemed committee in May 2007. At that time, the term "green collar job" only rarely had been heard in the halls of Congress. The term had seldom – if ever – appeared in the mainstream political press.

Today the concept is everywhere. The term resonates because it speaks to a deep and abiding hunger in our society for big, practical answers to big, tough challenges. Citizens and community members everywhere are seeking smart solutions to our two biggest problems – the economic downturn and the ecological collapse.

The nation is finally realizing that the solutions to these twin crises are linked. That is because nearly everything that is good for the environment – and practically everything that is good in the fight against global warming – is a job.

Solar panels don't install themselves. Wind turbines don't manufacture themselves. Homes and buildings don't retrofit or weatherize themselves. In our industrial society, trees don't even PLANT themselves, anymore. Real people must do all of that work.

To be successful, American workers need some new tools, some new training and access to some new technology. They also need a policy environment that supports employers who are trying to bring low-carbon prosperity to our country. With those things in place, we can begin to put some green rungs on America's ladder of opportunity.

If we are smart, we will make the invention, manufacturing and deploying of clean energy technology a cornerstone of the next American economy – and create green pathways out of poverty, while we do it.

The realization that we can simultaneously restore the Earth and revive our economy has inspired millions. Increasingly, federal, state and local elected officials, labor and business leaders, social justice champions, environmentalists and youth see great economic opportunities in advancing green solutions to our climate and energy crises.

And yet confusion reigns. Every day, someone asks me: "Oh, yes, we are very excited about all you are doing. But what exactly IS a green job?"

Also, some vocal opponents and naysayers have begun spreading falsehoods and confusion about what is in fact a very simple and practical concept. It must be said that even proponents of the idea have missed important opportunities to move the green jobs concept from rhetoric to reality. So we are all still finding our way in this journey toward a clean and green economy.

I want to address a few of those issues here. First of all, what is a "green

collar job"? The simplest definition is that it is a traditional, family-supporting, blue collar job – that has been upgraded and upskilled to better respect the environment. In other words, we are not talking about anything revolutionary. We are not talking Buck Rogers jobs, or science fiction jobs, or George Jetson jobs. These are very familiar jobs in familiar trades – roofers, metal workers, electricians, carpenters, etc. But they have been repurposed and up-skilled to meet the challenges of a carbon-constrained era.

Congress already spelled out critical skill-building supports and specific, eligible industries in the Green Jobs Act which passed into law as part of comprehensive energy legislation in December 2007 (P.L. 110-140):

> (1) energy-efficient building, construction, and retrofits industries; (construction)
> (2) renewable electric power industry; (energy)
> (3) energy efficient and advanced drive train vehicle industry; (transportation)
> (4) biofuels industry; (energy)
> (5) deconstruction and materials use industries; (recycling)
> (6) energy efficiency assessment industry serving the residential, commercial, or industrial sectors; and (construction/energy)
> (7) manufacturers that produce sustainable products using environmentally sustainable processes and materials (manufacturing).

Therefore, it is not true that these green jobs are strictly a term of art or a piece of political rhetoric, impossible to meaningfully define or precisely categorize. Also, it is not true that these are just hypothetical jobs or mythical jobs.

But while we are on the topic of mythology, let me address three actual myths about green jobs.

The first is that smart support for renewable energy and energy efficiency will not create a NET increase in jobs. The popular "zero sum" critique is that every green job actually will just represent the loss of a gray job, somewhere. In this view, it is impossible for a green

economy to actually increase the total number of jobs in the United States.

Thankfully, the Green Recovery report (commissioned by PERI and the Center for American Progress) thoroughly debunked this myth last year. That landmark study shows that the same amount of money invested in energy efficiency and renewable energy actually creates FOUR TIMES as many jobs as the same money invested in the oil industry.

It turns out that there are more effective and less effective ways for the federal government to spend money, if spurring job creation and creating economic opportunity is a goal. The Green Recovery report shows how $100 billion of smartly invested and leveraged federal dollars can create two million new jobs, in the next two years. The time has come to shift our priorities in a new direction.

The second myth is that public spending on expensive green energy is just going to drive up energy prices for working people and poor people. Therefore, disadvantaged people would be better off languishing in the present, pollution-based "gray economy" – rather than supporting a shift to a greener and cleaner economy.

Again, this is not true. A significant amount of the investment in the economic recovery bill likely will be in energy efficiency – such as in the Weatherization Assistance Program and the Energy Efficiency and Conservation Block Grant. These investments actually reduce energy costs and they create thousands of community jobs.

A recent study by Professor David Roland-Holst at the University of California at Berkley shows that the systematic multi-decade effort to promote "innovative energy efficiency policies in California created 1.5 million additional full-time jobs with a total payroll of over $45 billion. Furthermore, investments in renewable energy will help create economies of scale, which will drive down the price of these technologies – and they will level the playing field with the subsidized fossil fuel industry. In the long run, smart policy and investment will drive down prices for clean, renewable, homegrown energy sources. But if we cling to the old, carbon-intensive energy technologies, then the price we all pay – in volatile economic costs, in climate disruption and in threats to our national security – will continue to climb. And the

poor will be hit – first and worst – by every one of those rising costs. A well thought out shift to a clean energy economy offers more work, more wealth and better health to disadvantaged communities than does any plausible, business-as-usual scenario.

The last myth seems to afflict green job boosters, more so than green job detractors. That final myth is the notion that "talking" about green jobs somehow magically creates them. While maintaining our enthusiasm and evangelism for a new economic direction, the time has come for all of us to move even more aggressively from inspiration to implementation.

It pains me to point out that politicians and advocates (like myself) made countless speeches referencing green jobs last year. But in the end, Congress failed to appropriate the funds necessary for the one piece of federal legislation that would have made money available for green job training across the country: the Green Jobs Act of 2007, Title X of the Energy Independence and Security Act. We must do better.

When it comes to rhetoric about green jobs, we are experiencing a bubble. But when it comes to advancing meaningful, federal legislation for green jobs, we are still in a bowl. As someone who gives a lot of speeches, myself, let me say: messages and inspiration are important. But the American people cannot eat political sound-bites. They cannot take shelter under slogans.

People need real job training, real service opportunities and real jobs – right now, desperately. As you consider the upcoming economic recovery package, I urge you and your colleagues to seek full funding – and more – for the Green Jobs Act.

Furthermore, I urge you to go beyond that basic program to create something bolder. Now is the time for the United States to create a Clean Energy Corps to retrofit millions of buildings – while giving community service opportunities, job training and employment to hundreds of thousands of people. (Green For All and our allies are developing a proposal for just such an initiative, which we will submit next month for the committee's review.)

These are the kinds of concrete, practical actions that would represent

important steps forward in making America's green dreams come true.

Our national leaders this year can move on from changing the rhetoric to changing the lived reality for millions of Americans. That will be the great work for the new Administration, for the 111th Congress – and for all of us.

In a time of economic peril, let us never forget that everything that is required to make America's economy cleaner, greener and more resilient is a career pathway for someone. Or a business contract. Or an entrepreneurial opportunity. We can power America through this recession by repowering America with clean energy. We can create millions of jobs that will make our people wealthier and the Earth healthier. Let us begin.

In closing, let me thank you for your courage and your fortitude in these difficult times ... When a fire breaks out, there are only two kinds of people: the majority who wisely rush out – and the few who bravely rush in. For those who have prepared themselves to be in the latter category, we have a word: that word is "heroes."

Our country is facing multiple disasters and crises. Now is the time for heroines and heroes. Wiser people – seeing these difficulties on the horizon – might have chosen this moment to rush out of public service and to run away from the tough and controversial committees.

But you are braver people. And you have chosen to rush in – just when your country needs you the most. I thank you for that. We all do.

The next Congress can be a Congress of heroines and heroes. If you resolve to turn this economic breakdown into a genuine breakthrough for our planet and our people, it certainly will be.

I thank you for your time and attention.

Mr. PALMER. He gave my speech.

The CHAIRMAN. Let's hear it for Van Jones. What a great speech. Fantastic. I agree with you. We don't agree on the Dallas Cowboys, but Van Jones we agree on. Is this a great panel? Come on, I told you it was a great panel starting out here.

Our next witness is Denise Bode, who is the Chief Executive Officer of the American Wind Energy Association. She is a nationally recognized energy expert, and previously served as CEO of American Clean Skies Foundation and President of the Independent Petroleum Association of America.

Is this recombinant political DNA? This is the Obama era, huh? The President of the American Petroleum Association is now the head of the American Wind Energy Association, and this is the way the wind is blowing now, huh?

So Ms. Bode, we welcome you. Whenever you are ready, please begin.

STATEMENT OF DENISE BODE, CEO, AMERICAN WIND ENERGY ASSOCIATION

Ms. BODE. Thank you, Mr. Chairman, and Ranking Member Sensenbrenner, sorry he had to leave as well, and distinguished members of the committee, it is really a pleasure to be here. My name is Denise Bode, and I am CEO of American Wind Energy Association.

Our association is a national trade association of America's wind energy industry, with more than 1,800 member companies, including project developers, manufacturers, component and service supply.

I have to tell you, I come at an extraordinary time, and sitting next to Van Jones, I swear I am so excited about the future. I was excited before, and now I just want to go out and do even better work to support this new era of green energy jobs.

You know the economic, the national security, the energy and environmental challenges are numerous and momentous and, fortunately, the industry that I represent can play a key role in solving many of them for the future, including serving as economic driver.

Last week, I had the opportunity to attend the President-elect's speech where he announced that he wanted to double the amount of renewable energy over the next 3 years, and our industry is prepared to achieve that. In fact, to do so, though, we need Congress to adopt the right policies in this stimulus package as part of the economic recovery bill now being developed. And we have had great encouraging conversation over the past several days with Members of Congress, transition team, and I am really hopeful that when the details and the specs come out of this package it will include key provisions to enable us to continue to grow through the economic downturn.

Let me tell you just a little about the status of the wind industry, because I think a lot of folks still think of it as kind of a boutique industry or not really a major part of the growing energy generation source. Last year was the fourth straight year of record growth in the industry. We are still compiling final numbers, but more than 7,500 megawatts of wind energy was installed, second only to natural gas for the fourth year running. Total wind energy capacity

is now over 24,000 megawatts, and that is equivalent to 18 typical coal-fired power plants, eight nuclear plants. That replaces 140 million vehicles off the road.

Our industry has seen significant growth, though, in manufacturing as well. More than 65 new or expanded manufacturing facilities have been announced or opened since January 2007. That is amazing. Twenty-one States, too. Not just in certain select areas. Auto sector facilities have retooled the manufacture for wind. A former appliance manufacturing plant was renovated to build turbine blades. And I suspect there is no other sector of the economy that can point to that kind of manufacturing growth over this difficult economic period.

Even though our industry employs over 80,000 workers in good-paying jobs, we are just getting started and growing. In May 2008, the U.S. Department of Energy released a report on the feasibility of achieving 20 percent of our Nation's electricity from wind energy alone by 2030, and DOE concluded that with no—with absolutely no additional technological breakthroughs, that it is doable, and that achieving the level of deployment would have significant benefits for the environment and economy. And they talk about achieving that with increasing to over 500,000 jobs. And let me tell you, if you look at the numbers, since that report has been issued we have had met or exceeded every target every year in adding those megawatts.

But while the wind industry growth has been strong, the industry has not been immune to the larger forces that have dragged our economy down. The market is not there for us either. In fact, major developers of wind farms have publicly announced plans to cut back on turbine installations by 25 to 50 percent in 2009. And that setback also impacts manufacturers. DMI Industries, a tower manufacturer, is laying off around 191 employees. There is a blade manufacturer laying off 150 workers, another, TPI Composites, another one delayed plans to hire 300 workers, and Trinity Structural Towers is laying off another 131. Many of those are from all across the U.S.

Job losses will mount without congressional action. And, according to recent analysis, a failure to address the credit crisis and make sure tax incentives for renewable energy work in a down economy will result in the loss of 89,000 jobs in wind energy and related industries.

Because wind industry is capital intensive in growing, many developers do not have enough income and large enough tax bills to directly use the tax incentives, the production tax credit and accelerated depreciation that is intended to permit renewable energy. Instead, they partner with financial institutions that can use the incentives to offset their own tax liabilities.

The economic decline has eliminated many major financial players from the tax equity markets, dramatically reducing the ability of many wind power developers to realize the intended benefits of available tax incentives. In fact, the number of tax equity investors has been slashed from 20 in 2007 to approximately five today. Let me tell you, it is critically important that we make a huge difference in addressing the ability to utilize these tax incentives, and that is a lot to ask of only five investors.

Specific policies are needed in the economic recovery legislation. What the wind industry is seeking is temporary changes to Federal renewable energy incentives that will help expand the number of investors in renewable energy projects, assist in providing adequate capital for project development, and ensure that incentives provide the benefit Congress originally intended when extending the PTC. Specifically, we support changes that enable renewable energy developers to effectively monetize their tax credits and accelerated depreciation benefits to the extent they don't have sufficient levels of taxable income to otherwise utilize those tax incentives. Why put it in place if you can't use it? Allowing renewable energy developers to carry back PTCs against their tax liabilities over prior decades, and, third, a long-term extension of the PTC to provide a more stable environment for renewable energy developers.

Thank you so much. I have a lot more I can talk about in question and answers, and I appreciate the opportunity for somebody that has worked in the fossil fuel area who has seen the light and has been working now in the clean energy in the wind power era to testify before you and to hopefully add to this debate.

[The statement of Ms. Bode follows:]

Testimony of Denise Bode
CEO, American Wind Energy Association
Select Committee on Energy Independence and Global Warming
Hearing on "Reinvigorating the Economy through Stimulus Legislation: Opportunities for All"
January 15, 2009

Introduction

Chairman Markey, Ranking Member Sensenbrenner, and distinguished members of the Select Committee, thank you for the opportunity to testify.

My name is Denise Bode. I am the new CEO of the American Wind Energy Association (AWEA). AWEA is the national trade association of America's wind industry, with more than 1,800 member companies, including project developers, manufacturers, and component and service suppliers.

I come before you at an extraordinary time in our nation's history. The economic, national security, energy and environmental challenges are numerous and momentous. Fortunately, the industry I represent can play a key role in solving many of them, including serving as an economic driver.

Our industry is prepared to achieve the President-Elect's goal of doubling renewable energy over the next three years. But, to do so, we need Congress to adopt the right policies as part of the economic recovery bill now being developed. We have had encouraging conversations over the past several days with Members of Congress, staff, and the transition team and I am hopeful that economic recovery legislation will include key provisions to enable us to continue to grow through the economic downturn.

Status of the Wind Energy Industry

The growth in the wind energy sector in the United States over the last several years has been incredible. Wind energy is no longer a boutique energy source. It is mainstream and deployable immediately on a wide scale. We do not need to wait for a new energy future. It is here.

Last year was the 4th straight year of record growth in the wind industry. We're still compiling final numbers, but more than 7,500 megawatts of wind energy were installed, second only to natural gas for the fourth year running.

Total wind energy capacity is now over 24,000 megawatts. That is equivalent to 18 typical coal plants or 8 nuclear plants.

Our industry has seen significant growth in manufacturing as well. More than 65 new or expanded manufacturing facilities have been announced or opened since January 2007 in

more than 21 states. Auto sector facilities have retooled to manufacture for wind. A former appliance manufacturing plant was renovated to build turbine blades. I suspect there is no other sector of the economy that can point to that kind of manufacturing growth over this difficult economic period.

Our industry employs at least 80,000 workers in good paying jobs. We are the backbone of the new energy economy. And, we're just getting started.

In May 2008, the U.S. Department of Energy released a report on the feasibility of achieving 20% of our nation's electricity from wind energy alone by 2030. The DOE concluded that it is doable with no technological breakthroughs and that achieving that level of deployment would have significant benefits for the environment and our economy, including employing 500,000 people.

The Impact of the Economic Downturn on the Wind Energy Industry

While the wind industry's growth has been strong, the industry has not been immune to the larger forces that have dragged our economy down.

Major developers of wind farms have publicly announced plans to cut back on turbine installations by 25%-50% in 2009.

This setback on the development side is also impacting manufacturers. DMI Industries, a tower manufacturer, is laying-off around 190 employees. LM Glasfiber, a blade manufacturer, is laying-off 150 workers. TPI Composites, another blade manufacturer, has delayed plans to hire 300 workers. And, Trinity Structural Towers is laying-off 131 workers.

Job losses will mount without congressional action. According to recent analysis, a failure to resolve the credit crisis and make sure tax incentives for renewable energy work in a down economy will result in the loss of 89,000 jobs in wind energy and related industries.

Because wind energy is a capital-intensive and growing industry, many developers do not have enough income and a large enough tax bill to directly use tax incentives - PTCs and accelerated depreciation - intended to promote renewable energy. Instead, they partner with large financial institutions that can better use the incentives to offset their own tax liabilities.

The economic decline has eliminated many major financial players from the tax equity markets, dramatically reducing the ability of many wind power developers to realize the intended benefits of available tax incentives. The number of tax equity investors has been slashed from 20 in 2007 to approximately 5 today. Yet, according to Hudson Clean Energy Partners, in order to meet the demand for tax equity from renewable generators the tax equity market would need to double to $11.1 billion in 2009, $17.6 billion next

year and nearly $30 billion in 2011 to put us on the path to achieving President-Elect Obama's goal of doubling renewable energy. That is a lot to ask of only five investors.

Specific Policies Needed in Economic Recovery Legislation

The wind energy industry is seeking temporary changes in federal renewable energy incentives that will help expand the number of investors in renewable energy projects, assist in providing adequate capital for project development, and ensure the incentives provide the benefit Congress originally intended when extending the PTC.

Specifically we support:

(1) Changes that enable renewable energy developers to effectively monetize their PTC and accelerated depreciation benefits to the extent they do not have sufficient levels of taxable income to otherwise utilize these tax incentives;

(2) Allowing renewable energy developers to carry back PTCs generated in 2008 and 2009 (regardless of when the facility was put into service) against their tax liabilities over the prior decade to the extent they make new renewable energy investments in 2009;

We are also seeking:

(3) A long-term extension of the PTC to provide a more stable investment environment for renewable energy developers.

Conclusion

Thank you for the opportunity to testify. The President-elect and Members of Congress from both parties have championed renewable energy. We sincerely thank you for that support. However, we need Congress and the President-Elect to recommit to renewable energy by adopting these critical provisions in economic recovery legislation.

Finally, you can learn more about the wind energy industry's full policy agenda online at newwindagenda.org

I am happy to answer any questions.

House Rule XI(g)(4) Compliance Statement

The American Wind Energy Association received a grant from the U.S. Department of Energy Golden Field Office totaling $275,000 for the period December 1, 2006 through December 31, 2008 of which $162,128.15 had been distributed as of September 30, 2008.

The CHAIRMAN. Thank you very much. And thank you for being here as well.

Our next witness, Dr. David Kreutzer, is Senior Policy Analyst in Energy Economics and Climate Change at the Heritage Foundation. He taught economics at James Madison for more than 20 years, and he also served as the mayor of Dayton, Virginia in 2003 and 2004.

So we welcome you, sir. Whenever you are ready, please begin.

STATEMENT OF DAVID KREUTZER, SENIOR POLICY ANALYST, HERITAGE FOUNDATION

Mr. KREUTZER. Thank you very much. Mr. Chairman, I want to thank you and the members of the Select Committee on Energy Independence and Global Warming for this opportunity to address you. I would like to point out that I would thank you even more heartily if next time you have me speak before Van Jones instead of after.

My name is David Kreutzer. I am Senior Policy Analyst in Energy Economics and Climate Change at the Heritage Foundation. The views I express in this testimony are my own and should not be construed as representing any official position of the Heritage Foundation.

Concern with the state of our economy is understandable, as is the desire to take action to improve it. The committee has asked me to address several questions regarding economic stimulus as it relates to energy and climate policies.

The first question is, how would mandatory restrictions on carbon emissions affect the U.S. economy? Mandatory restrictions on carbon dioxide emissions reduce economic growth and destroy jobs. Last summer, a colleague, Dr. Karen Campbell, and I analyzed the impact on the economy from regulating carbon dioxide as a Clean Air Act pollutant. We have attached that report to my testimony, and I hope it would be entered into the record.

The CHAIRMAN. Without objection.

[The information follows:]

A Report of The Heritage Center for Data Analysis

CO_2-Emission Cuts: The Economic Costs of the EPA's ANPR Regulations

David W. Kreutzer, Ph.D., and Karen A. Campbell, Ph.D.

CDA08-10 October 29, 2008

The Heritage Foundation
LEADERSHIP FOR AMERICA

214 Massachusetts Avenue, NE • Washington, DC 20002 • (202) 546-4400 • heritage.org

CDA08-10 January 14, 2009

CO_2-Emission Cuts: The Economic Costs of the EPA's ANPR Regulations

David W. Kreutzer, Ph.D., and Karen A. Campbell, Ph.D.

The Environmental Protection Agency's (EPA) Advance Notice of Proposed Rulemaking (ANPR) foreshadows new regulations of unprecedented scope, magnitude, and detail. This notice is not just bureaucratic rumination, but could very well become the law of the land. Jason Grumet, a senior environmental advisor to Barack Obama, has promised that a President Obama would "initiate those rulings." These rulings offer the possibility of regulating everything from lawn-mower efficiency to the cruising speed of supertankers. Regardless of the chosen regulatory mechanisms, the overall economic impact of enforced cuts in carbon dioxide (CO_2) emissions as outlined in the ANPR will be equivalent to an energy tax.

By expanding the scope of the 1990 amendment to the Clean Air Act (CAA), the EPA will severely restrict CO_2 emissions, thereby severely restricting energy use.[1] Specifically, the EPA would use the CAA to regulate emissions of greenhouse gases (GHG) from a vast array of sources, including motor vehicles, boats and ships, aircraft, and rebuilt heavy-duty highway engines.[2] The regulations will lead to significant increases in energy costs. Furthermore, because the economic effect of the proposed regulations will resemble the economic effect of an energy tax, the increase in costs creates a correspondingly large loss of national income.

Using the CAA to regulate greenhouse gases will be very costly, even given the most generous assumptions. To make the best case for GHG regulation, we assume that all of the problems of meeting currently enacted federal, state, and local legislation have been overcome.[3] Even assuming these unlikely goals are met, restricting CO_2 emissions by 70 percent will damage the U.S. economy severely:

- Cumulative gross domestic product (GDP) losses are nearly $7 trillion by 2029 (in inflation-adjusted 2008 dollars), according to The Heritage Foundation/Global Insight model (described in Appendix A).

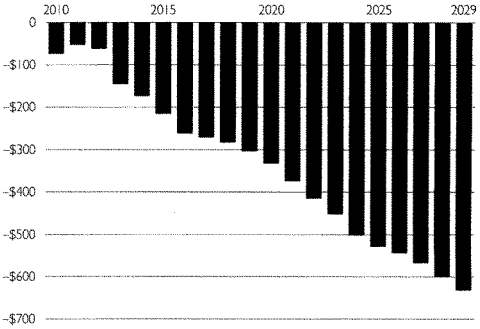
1. The EPA has the authority to regulate all greenhouse gases. The primary GHGs to be regulated are CO_2, methane, and nitrous oxide. This paper limits its analysis to the economic impact from the higher energy costs that regulating CO_2 would generate.
2. In *Massachusetts v. the Environmental Protection Agency*, 549 U.S. 497 (2007), a divided Supreme Court determined that carbon dioxide is a pollutant as defined in the Clean Air Act. This decision gives the EPA the authority, but not necessarily the mandate, to regulate CO_2 to prevent global warming or other harmful effects attributed to CO_2. Though the EPA has not, as of this writing, made the endangerment finding that would precipitate regulation, the detailed proposals of the Advanced Notice of Proposed Rulemaking can be interpreted to indicate just such an intent. An endangerment finding is very likely to precipitate a cascade of regulatory actions even though the EPA may prefer a more limited response. This study makes the generous assumption that the EPA can limit the scope and speed with which the regulations are implemented.
3. Examples of the costly existing regulations are the enacted, but not yet in effect, higher Corporate Average Fuel Economy (CAFE) standards, renewable portfolio standards for electricity generation, and stricter building codes.

- Single-year GDP losses exceed $600 billion (in inflation-adjusted 2008 dollars).
- Annual job losses exceed 800,000 for several years.
- Some industries will see job losses that exceed 50 percent.

Due to limitations in macroeconomic models, this analysis by The Heritage Foundation's Center for Data Analysis (CDA) does not extend beyond 2029. Further, the ANPR alludes to regulations in general, but is not as specific as proposed legislation. Nevertheless, the ANPR's implicit CO_2 targets resemble previous attempts to legislate GHG emissions, such as the 2008 Lieberman–Warner Climate Security Act (S. 2191), which mandated a 70 percent reduction below the 2005 level by 2050.

Lost Gross Domestic Product Due to Clean Air Act Regulation of CO_2

By restricting CO_2, the Clean Air Act will create higher energy costs and decrease the U.S. economy by an average of $339 billion every year through 2029.



Source: Center for Data Analysis, Heritage Foundation calculations from the Global Insight macroeconomic model.

Chart 1 • CDA 08-10 heritage.org

The new ANPR regulations will force consumers to pay more for energy as well as for other goods. Furthermore, the increased regulations and subsequent high energy prices throw a monkey wrench into the production side of the economy. Contrary to claims of an economic boost from "green investment" and "green collar" job creation, more EPA regulation *reduces* economic growth, GDP, and employment opportunities.

While there are some initial years in the period of our analysis during which CAA regulation of GHG could spur additional investment, this investment was completely undermined by the higher energy prices. Investment contributes to the economy when it increases future productivity and income. The greater and more effective the investment, the greater the increase in future income. Since income (as measured by GDP) drops as a result of new regulation, it is clear that more capital is destroyed than created. The cumulative GDP losses for 2010 to 2029 approach $7 trillion with single-year losses of nearly $650 billion.

The anticipated "green-collar" jobs meet a similar fate. It may well be that some businesses will experience an increase in employment. But, overall, companies are saddled with significantly higher energy costs, as well as increased administrative costs, that will be reflected in their product prices. The higher prices make their products less attractive to consumers and thus less competitive. As a result, total employment drops along with the drop in sales.

With increased regulation through the CAA, there is a small initial increase in employment as businesses build and purchase the newer, more CO_2-friendly plants and equipment. However, any "green-collar" jobs created are more than offset by the hundreds of thousands of lost jobs in later years. Chart 2 illustrates the projections of overall employment losses from these restrictions on CO_2 emissions.

ANPR—WHAT IT REALLY MEANS

In response to the Supreme Court's decision in *Massachusetts v. EPA*, the EPA has proposed an unprecedented expansion of federal GHG regulation through the CAA. While the precise details of the regulations remain undefined, the ANPR is sure to generate many of the same economic responses as the Lieberman–Warner Climate Security Act.

As the EPA does not appear to have the statutory authority necessary to implement market-based

approaches to GHG reduction, such as a carbon tax, in which case firms and consumers could economize on taxed goods and promote alternatives or technology-neutral subsidies, the ANPR relies on a set of rules and restrictions while ultimately failing to achieve a meaningful reduction in atmospheric concentrations of GHGs. The end result of these complex regulations will be a dramatic increase in energy costs with little environmental gain.

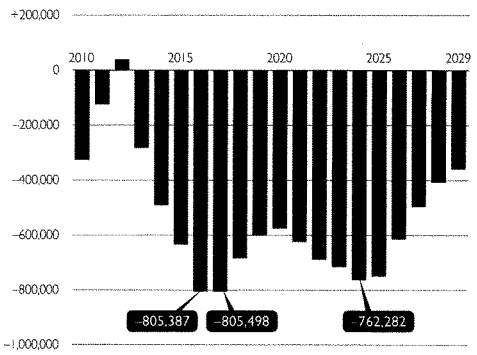
In addition to increasing the costs of energy use, regulating GHGs through the Clean Air Act will expand the EPA's authority to unprecedented levels. The ANPR will likely:

- Trigger the Prevention of Significant Deterioration (PSD) program, which could require permits for large office and residential buildings, hotels, retail stores, and other similarly sized projects;
- Regulate the design of manufacturing plants;
- Regulate the design of airplanes;
- Lower speed limits below current levels;
- Impose speed restrictions on ocean-going freighters and tankers;
- Export economic activity to less-regulated countries, thereby compromising the U.S.'s ability to compete in the global economy; and
- Transform the EPA into a *de facto* zoning authority, granting the agency control over thousands of previously local or private decisions, affecting the construction of schools, hospitals, and commercial and residential development.

These regulations are just a small sample of the areas into which the ANPR would expand the EPA's authority.

Clean Air Act Regulations Will Destroy Jobs

For most years job losses exceed one-half million.



Source: Center for Data Analysis, Heritage Foundation calculations from the Global Insight macroeconomic model.

Chart 2 • CDA 08-10 heritage.org

Limits of Analysis

Regulating CO_2 emissions under the Clean Air Act will burden the economy with higher energy costs, higher administrative compliance costs for businesses, higher bureaucratic costs for enforcing the regulations, and higher legal costs from the inevitable litigation. This study examines only the economic impact from the higher energy costs. Further, CDA analysts assume that the EPA can enforce CO_2 restrictions with perfect efficiency. In no case does the EPA cut a pound of CO_2 in one area if it could be done more cheaply in another. Including the other compliance costs and accounting for the likely inefficiency in imposing regulation, the costs of regulating CO_2 emissions under the Clean Air Act may be significantly higher.

For an example of the extent to which administrative compliance costs may be burdensome, see Portia M. E. Mills and Mark P. Mills, "A Regulatory Burden: The Compliance Dimension of Regulating CO_2 as a Pollutant," The U.S. Chamber of Commerce, September 2008, *http://www.uschamber.com/assets/env/regulatory_burden0809.pdf* (October 23, 2008).

THE SIMULATIONS

This CDA report discusses the effect the ANPR will have on energy activity and the cost of using energy. Policymakers and others who follow the climate change debate should find this simulation helpful in understanding the economic consequences of such unprecedented regulatory expansion. This report makes no attempt, however, to calculate the significant administrative and legal costs of complying with the new rules.

The report discusses two different policy alternatives affecting this country's economic future, each shaped by different policies designed to reduce atmospheric carbon dioxide and, presumably, to reduce the warming trend in global climate change:

- **The current-law baseline** is a highly detailed, 30-year economic forecast that incorporates the principal elements of energy and climate change policies signed into law last year.
- **The alternative** is a scenario in which the EPA promulgates a broad range of regulations to cut CO_2 emissions by 70 percent by 2050.

THE BASELINE

Key Assumptions. The baseline for the ANPR simulations builds on the Global Insight (GI) November 2007 long-term-trend forecast. The GI model assumes that:

> [T]he economy suffers no major mishaps between now and 2037. It grows smoothly, in the sense that actual output follows potential output relatively closely. This projection is best described as depicting the mean of all possible paths that the economy could follow in the absence of major disruptions. Such disruptions include large oil price shocks, untoward swings in macroeconomic policy, or excessively rapid increases in demand.[4]

The GI long-term model forecasts the trend of the U.S. economy. "Trend" means the most likely path that the economy will follow if, for instance, it is not disturbed by a recession, extremely high oil prices, or the collapse of major trading partners. One way to think about the long-term trend is to imagine a pathway through the cyclical patterns of our economy, as well as the effects of cyclical patterns in foreign economies on the U.S. economy.

Given the fiscal and economic challenges facing the United States (particularly the mounting federal deficits stemming from the long-expected crisis in Social Security, Medicare, and Medicaid outlays), the long term already has significant risks. The baseline assumes that the economy successfully avoids any sharp drops. At the same time, there is no inclusion of similarly large, potentially positive, shocks to the economy.

Energy prices, patterns of use, and supply change continuously in response to legislation and market conditions. To evaluate the economic impact of ANPR regulations, we must establish what the expected levels of emissions and available technology would be over the bill's proposed lifetime in the absence of its passage. Only with a determined baseline situation can the costs of meeting the goals and constraints of these regulations be estimated.

Two fundamental trends establish the baseline path of CO_2 emissions. First, aggregate income growth leads to greater demand for power across all sectors of the economy. Most of this power is generated by burning fossil fuels.

Partially offsetting the associated increase in CO_2 emissions is the second trend of increasing carbon efficiency in the energy sector. The improved efficiency comes from a variety of changes in both production and consumption, including power-generating technology that increases the yield of useable power for each ton of CO_2 emitted; continual improvements in the energy efficiency of appliances, new homes, and light vehicles; increased use of renewable fuels; and greater generation and use of nuclear power.

Government mandates—federal, state, and local—continue to enforce additional energy effi-

4. Global Insight, "Long-Term Forecast 30-Year Overview," October 2007. Heritage Foundation analysts relied on models maintained by Global Insight to develop the economic estimates reported in this paper. The Global Insight model is used by private-sector and government economists to estimate how changes in the economy and public policy are likely to affect major economic indicators. The methodologies, assumptions, conclusions, and opinions presented here are entirely the work of analysts at The Heritage Foundation's Center for Data Analysis. They have not been endorsed by, and do not necessarily reflect the views of, the owners of the Global Insight model.

ciency and limit CO_2 emissions, which helps to meet the ultimate target of the ANPR regulations. These mandates may work in parallel with the ANPR, and they create compliance costs, but since these compliance costs are already in force without the additional regulation under the CAA, they are not attributable to the ANPR.

Examples of the baseline costs necessary for meeting the ANPR goals that are attributable to other legislation include:

- Manufacturing cars and trucks that satisfy the much higher fuel-economy standards mandated for the next 20 years;
- Producing 36 billion gallons of biofuels including 16 billion gallons of cellulosic ethanol;
- Complying with expensive new building codes; and
- Producing ever more energy-efficient household appliances.

Aggregate Energy Use. Continued gains in energy efficiency will restrain the growth of energy demand below the rates of economic growth and below the rates experienced in the past half-century—approximately 1.5 percent per year. These efficiencies are driven by both markets and mandates. We project baseline primary energy demand to grow at 0.5 percent each year through 2029.

Petroleum. According to baseline assumptions, petroleum prices will settle around $70 a barrel in nominal terms and decline to $46 a barrel (in 2006 dollars) by 2030. Even in the absence of Corporate Average Fuel Economy (CAFE) limit changes, higher prices induce consumers to move to more efficient vehicles.

On the mandates side, the Energy Independence and Security Act of 2007 (EISA) raises the bar for vehicle fuel efficiency. The CAFE standard rises to 35 miles per gallon by 2020 for all light vehicles. For subsequent years, the EISA mandate reads:

> For model years 2021 through 2029, the average fuel economy required to be attained by each fleet of passenger and non-passenger automobiles manufactured for sale in the United States shall be the maximum feasible average fuel economy standard for each fleet for that model year.

The expected CAFE standards are 47.5 miles per gallon for new passenger cars and 32 miles per gallon for new trucks by 2029, and the average for all light vehicles, whether new or old, will be 33 miles per gallon.

Overall, petroleum consumption will grow by 0.6 percent per year between 2005 and 2029.

Natural Gas. In the baseline scenario, gas prices settle just below $7 per million British thermal units. This is less than the current price but well above 1990s levels. Alaskan pipeline deliveries will not begin until 2025, at which point they will help to offset supply reductions in the Lower 48 as well as imports from Canada.

Nearly 100 gigawatts of old natural-gas-steam are retired, and 50 gigawatts of the more efficient "natural gas combined cycle" (NGCC) plants are built. Total natural gas consumption grows by 0.4 percent per year through 2029.

Coal. In the baseline case, coal use is restrained by slower growth of energy demand and increasing generation of nuclear and renewable power. Demand will grow by an average of 0.2 percent each year through 2029.

One hundred gigawatts of old inefficient power-generating capacity are retired. Sixty-five gigawatts of new and replacement coal-fired power-generation plants will be added using the "integrated gas combined cycle" (IGCC) or advanced pulverized-coal technologies. These more efficient technologies use less coal and emit less CO_2 per unit of electricity generated and are ready to be fitted for carbon capture and sequestration (CSS). Because of the additional cost, there is no use of CCS technology in the baseline case.

Better and more widely adapted scrubbing technology allows broader use of high-sulfur coal. This will open up more sourcing options and lower the average cost of coal.

In real dollars, coal prices will settle near the levels observed in the 1990s.

Nuclear Energy. Though there are no significant CO_2 emissions from nuclear power generation, it is not considered "renewable" for the purpose of meeting existing state-imposed targets. Nevertheless, federal incentives are already in place for building 12 gigawatts of new capacity and 3 gigawatts of uprated added capacity at existing plants.

Resolving the problems with waste disposal is a major hurdle in expanding nuclear power generation. The baseline assumption is that nuclear power plants will continue to store the waste on

site. Given the already high use of available capacity, electricity generated by nuclear power is projected to grow by only 0.5 percent per year through 2029.

Renewable Energy Sources. Federal and state initiatives already in place seek to increase the use of renewable energy sources. The definition of "renewable" varies from state to state but generally includes biomass, wind, and solar power.

Higher fuel prices along with state and federal mandates cause renewable fuel use to grow at 5.5 percent per year through 2029. We assume that producers will be able to meet the ethanol (corn-based and cellulose-based) targets set by the EISA, though experience thus far suggests otherwise.

THE ALTERNATIVE

Key Assumptions. The ANPR contains no explicit overall targets for emissions reductions on an annual basis; most likely the reductions will be phased in. Using previous emission levels as yardsticks, we assume that the 2012 emissions will match the 2005 emission level and drop by roughly 2 percent per year. The allowed emissions drop to 15 percent below the 2005 emissions level by 2020, and to 31 percent below the 2005 levels by 2029. Though we do not model the impact of regulations beyond 2029, the typical target would be a 70 percent reduction by 2050.

There are other gases that have much higher greenhouse effects per ton of emissions than CO_2. However, these gases are emitted in much smaller volumes by human activity. CO_2 is responsible for about 85 percent of the man-made GHG warming; therefore, this study examines only the economic impact of constraints on CO_2 emissions.

Coal Technology. Due to its abundance, coal is the least expensive source of energy, and it fuels about half of America's electricity supply. CCS is a promising, but not yet commercialized, technology for dramatically reducing CO_2 emissions from coal-powered electricity.

Of course, CCS technology has additional costs, which are higher when retrofitting existing plants than when building the technology into new plants. Though there are pilot projects in operation, full-scale commercialization would require sequestering more than 40 million barrels of CO_2 each day. Environmental concerns and the logistical hurdles of handling such large quantities are likely to delay full implementation of CCS until after 2029, so we assume no CCS during the 2010–2029 period examined here.

Nuclear Energy. The projection is for no additional nuclear power beyond the additional 15 gigawatts in the base case.

Renewable Energy Sources. Current state and federal legislation calls for more than tripling the amount of renewable energy in power generation and increasing the amount of biofuels used in transportation by more than 1,000 percent. This includes 16 billion gallons per year of corn-based ethanol and biodiesel and 20 billion gallons per year of cellulosic ethanol and biodiesel. Again, our assumption is that cellulosic biofuels become commercially feasible in time to meet the mandates that are already planned. Progress on cellulosic ethanol has been frustratingly slow to this point.

While the ANPR may have no additional mandates for biofuels, restricting CO_2 emissions from fossil fuel use will lead to greater use of biofuels. At this time, there is no commercially feasible cellulosic ethanol production. If this technology fails to deliver as projected, energy prices will be forced to increase enough to reduce the quantity of energy demanded by the amount of missing cellulosic ethanol.

Green Jobs

Higher energy prices lead consumers and producers to economize their energy use. This will come from a combination of simply producing and using less of the energy-consuming products and activities. The economizing can also come from investing in more energy-efficient products and processes. This latter response is often credited with creating "green" or "green-collar" jobs. These responses have been estimated in the equations of the macro-economic model used for our analysis. Therefore, the job losses reported in this study are over and above any "green" job gains. The net impact of the regulations will be lower employment and less income. The "green jobs dividend" is negative.

ECONOMIC COSTS OF THE ANPR

The ANPR affects the economy directly by increasing the cost of using carbon-based energy. These higher costs require consumers and producers to switch to inferior or more expensive substitutes or to simply cut production and consumption.[5]

The economic model employed here treats the proposed regulations like a tax on energy producers. Thus, energy prices increase by the amount dictated by the regulations. The demand for energy responds to higher energy prices both directly and indirectly. The direct effect is a reduction in the consumption of carbon-based energy and a shift, where possible, to substitutes that either do not require the fee or require a smaller one.

The indirect effects are more complex. Generally speaking, the ANPR regulations reduce the amount of energy used in producing goods and services, which restricts the demand for labor and capital and reduces the rate of return on productive capital. This "supply-side" impact exerts the predictable secondary effects on labor and capital income, which depresses consumption.

These are not unexpected effects. Carbon-reduction schemes that depend on excessive regulations, fees, or taxes attain their goals of lower atmospheric carbon by slowing carbon-based economic activity. Of course, advocates of this approach hope that other energy sources will arise that can be used as perfect substitutes for the reduced carbon-based energy.

Our simulation of potential CAA regulations attempts to follow the vision of the authors' proposal. The process is assumed to be unhampered by lawsuits, bureaucratic inefficiencies, or technological bottlenecks. Everything is "by the book."

If we have succeeded in these efforts, then policymakers can expect the following similar economic effects:

Economic Output Declines. The broadest measure of economic activity is the change in GDP after accounting for inflation. GDP measures the dollar value of all goods and services produced for final sale to consumers in the United States during the year. Anticipation of CO_2 restrictions causes an initial increase in gross private investment as firms accelerate capital projects to avoid the higher costs of a CO_2-constrained economy. In addition, there may be some initial-investment increases from businesses replacing their soon-to-be obsolete energy-intensive capital.

Nevertheless, the net impact on a CO_2-constrained economy is negative, since GDP is never higher than in the baseline scenario. Higher energy costs decrease the use of carbon-based energy in the production of goods, incomes fall, and demand for goods subsides. GDP declines in 2020 by $332 billion, in 2025 by $528 billion, and in 2029 by $632 billion. The aggregate income loss for the 20-year period is $6.8 trillion. All figures have been adjusted for inflation to reflect 2008 prices.

This slowdown in GDP is seen more dramatically in the slump in manufacturing output. Again, the manufacturing industry benefits from the initial investment in new energy production and energy-efficient capital, but the manufacturing sector's declines are sharp thereafter.

Indeed, by 2029, manufacturing output in this energy-sensitive sector will be 27 percent below what it would be if the ANPR proposals are never applied. In 2029, the manufacturing output is $1.48 trillion less than the baseline output; that is, when compared to the economic world without the CAA regulation of CO_2. This is equivalent to losing more than 80,000 manufacturing firms. Aggregate manufacturing loss from 2010 to 2029 is $10.9 trillion.

Number of Jobs Declines. The loss of economic output is the proverbial tip of the economic iceberg. Below the surface are economic reactions to the legislation that led up to the drop in output. Employment growth slows sharply following the boomlet of the first few years. Potential employment (or the job growth that would be implied by the demand for goods and services and the relevant cost of capital used in production) slumps sharply. In 2015, regulation-induced employment losses exceed 500,000; and they exceed that level for the remainder of the investigated period. Non-farm job losses peak at more than 800,000.

Indeed, in no year after the boomlet does employment under the ANPR outperform the base-

5. These adjustments will take place on many dimensions. For instance, consumers may be forced to consume more expensive and less reliable solar and wind energy; consumers may drive smaller, less safe cars; and increased building costs can lead to smaller and more expensive homes.

line economy where these proposed regulations never become law.

For manufacturing workers, the news is grim indeed. Employment will already be in decline due to increased labor-saving productivity: Our baseline shows that even without additional job-killing regulations, manufacturing employment will drop by more than 980,000 jobs. The ANPR accelerates this decrease substantially: Employment in manufacturing declines by an additional 22.6 percent or 2,880,000 jobs beyond the baseline losses. By 2029, several specific areas of the manufacturing industry will experience particularly harsh employment losses:

- Durable-manufacturing employment will decrease by 28 percent;
- Machinery-manufacturing job losses will exceed 57 percent;
- Textile-mills employment will decrease by 27.6 percent;
- Electrical-equipment and -appliance employment will decrease by 22 percent;
- Paper and paper-product jobs will decrease by 36 percent; and
- Plastic and rubber products employment drops 54 percent.

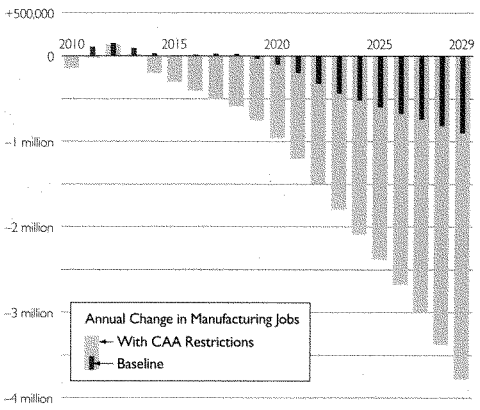
All employment declines described are in addition to those that occur in the baseline projections.

Other, less energy-intensive sectors, however, do not suffer such decreases. For instance, government employment ends the 20-year period 0.62 percent ahead of the baseline level; professional and business service employment (which includes lawyers) rises by 6.14 percent; and employment in education rises by 8.4 percent more than the baseline.

Because states have different mixes of industries, the job losses are not evenly distributed. The states whose economies are disproportionately dependent on manufacturing, such as Indiana, Louisiana, Wisconsin, Iowa, and Oregon, will be disproportionately affected by the manufacturing job losses.

Manufacturing Jobs Will Take Significant Hit

Primarily due to increasing productivity, manufacturing can expect to see employment losses approaching 1 million jobs even without restrictions on CO_2 emissions. This is the baseline case. Higher energy costs from CO_2 restrictions under the Clean Air Act will lead to nearly 3 million more lost jobs in addition to the baseline losses.



Source: Center for Data Analysis, Heritage Foundation calculations from the Global Insight macroeconomic model.

Chart 3 • CDA 08-10 heritage.org

Incomes and Consumption Decline. Declining demand for energy-intensive products reduces employment and incomes in the businesses producing these products. Workers and investors earn less, and household incomes decline. Reductions in income in these sectors spread and cause declines in demand for other sectors of the economy.

Our simulation captures this effect of higher energy costs: Disposable personal income falls $145 billion below baseline in 2015 and averages $2.6 trillion below baseline over the entire period of 2010 to 2029.

CONCLUSION

The ANPR proposes an unprecedented expansion of federal ability to regulate CO_2 emissions. Its limits on CO_2 emissions would impose significant costs on virtually the entire American economy.

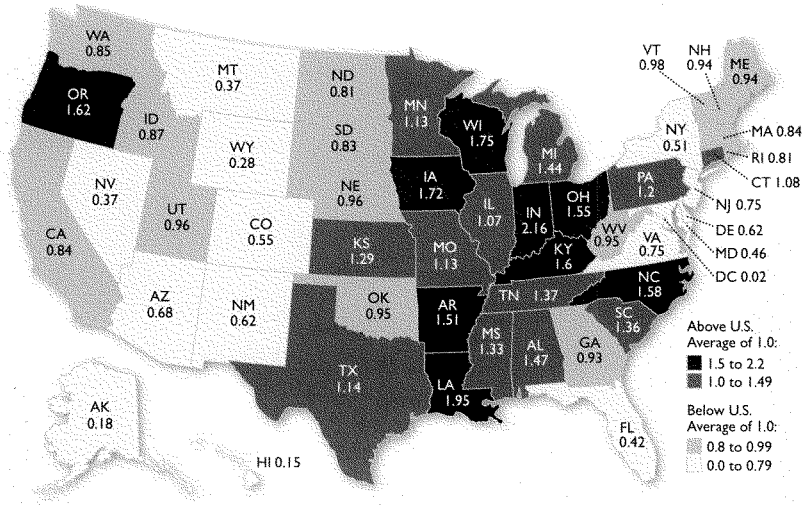
Even under a fairly optimistic set of assumptions, the economic impact of the ANPR is likely to be serious for the job market, household budgets, and the

economy overall. The effects discussed above in the simulation are the result of restricted energy use only; they do not consider the substantial administrative costs of complying with the new regulations.

The burden will be shouldered by the average American. The regulations would have the same impact on GDP and employment as would a major new energy tax—only worse. In the case of the

State-by-State Manufacturing Intensity

This map shows the relative importance of manufacturing in each state compared to the U.S. average. Proposed restrictions on CO_2 will cut overall manufacturing jobs by 23 percent and cause some manufacturing industries to lose more than 50 percent of their jobs. States with manufacturing intensity greater than 1.0 can expect more severe job losses in manufacturing.



U.S. Rankings, from Highest to Lowest

	State			State			State	
1	Indiana	2.16	18	Minnesota	1.13	35	North Dakota	0.81
2	Louisiana	1.95	19	Missouri	1.13	36	Rhode Island	0.81
3	Wisconsin	1.75	20	Connecticut	1.08	37	New Jersey	0.75
4	Iowa	1.72	21	Illinois	1.07	38	Virginia	0.75
5	Oregon	1.62	22	Vermont	0.98	39	Arizona	0.68
6	Kentucky	1.60	23	Nebraska	0.96	40	Delaware	0.62
7	North Carolina	1.58	24	Utah	0.96	41	New Mexico	0.62
8	Ohio	1.55	25	Oklahoma	0.95	42	Colorado	0.55
9	Arkansas	1.51	26	West Virginia	0.95	43	New York	0.51
10	Alabama	1.47	27	Maine	0.94	44	Maryland	0.46
11	Michigan	1.44	28	New Hampshire	0.94	45	Florida	0.42
12	Tennessee	1.37	29	Georgia	0.93	46	Montana	0.37
13	South Carolina	1.36	30	Idaho	0.87	47	Nevada	0.37
14	Mississippi	1.33	31	Washington	0.85	48	Wyoming	0.28
15	Kansas	1.29	32	California	0.84	49	Alaska	0.18
16	Pennsylvania	1.20	33	Massachusetts	0.84	50	Hawaii	0.15
17	Texas	1.14	34	South Dakota	0.83	51	D.C.	0.02

Source: Heritage Foundation calculations based on data from Bureau of Economic Analysis, Gross Domestic Product by State, 2007, at *http://www.bea.gov/regional/gsp*.

Map 1 • CDA 08-10 ☎ heritage.org

CAA, increases in costs are set by forces beyond legislative control.

Overall, using the CAA to regulate CO_2 would likely be the most expensive and expansive environmental undertaking in history.

—David W. Kreutzer, Ph.D., is Senior Policy Analyst for Energy Economics and Climate Change, and Karen A. Campbell, Ph.D., is Policy Analyst in Macroeconomics, in the Center for Data Analysis at The Heritage Foundation.

APPENDIX A
METHODOLOGY

Analysts at The Heritage Foundation and the Global Insight forecasting company employed a wide array of analytical models to produce the micro- and macroeconomic results reported in this paper. This section describes the models and the major steps performed by these analysts to shape the modeling results.

U.S. Energy Model (Long-Term)

Global Insight's U.S. Energy Model has been designed to analyze the factors that determine the outlook for U.S. energy markets. A staff of more than 15 energy professionals supports the model and forecasting effort. The model is constructed as a system of several models that can be used to assess intra-market issues independently of each other. The integrated system is used to produce Global Insight's baseline Energy Outlook and allows users to simulate changes in domestic energy markets.

The U.S. Energy Model is an integrated system of fuel and electric power models and the End-User Demand Model. The solution is achieved through an iterative procedure. Also, monthly models of petroleum and natural gas prices use the framework of the long-term forecast with additional weekly and monthly information to analyze seasonal fuel prices and update the price forecasts on a monthly basis. The major models that comprise the Energy Model and their interrelationships are described below.

End-Use Demand Model. Demand for final-use energy is modeled by sector, fuel, and census region based on the competitive position of each fuel in its end-market. The total demand for energy is estimated as a function of the stock of energy equipment, technology change, prices of competing final energy sources, and economic performance. The initial demand profile by region of the U.S. for each fuel is then integrated with the U.S. Petroleum, Natural Gas, Coal, and Electric Power Models, each of which consists of three major sub-modules—a supply and transformation module, a transportation/transmission/distribution module, and a wholesale/retail price module.

U.S. Petroleum Model. The U.S. Petroleum Model uses the world oil price projection from Global Insight's Global Oil Outlook. The model then determines refined petroleum product prices to end-users by adding refining markups, inventory, and transportation costs. For selected products, federal, state, and local taxes are also accounted for in the model.

The U.S. Petroleum Model also provides a baseline projection of U.S. crude and natural gas production that is based on an annual review of data and literature on U.S. reserves, production, and technological progress.

A simulation block for investigating the supply response under alternative assumptions is part of this model. Imported supplies of crude and petroleum products are developed by the difference between domestic production and the sum of the direct consumption of petroleum by consumers and the transformation demand for petroleum by the power sector.

Natural Gas Model. The Natural Gas Model consists of three major sub-modules: a supply module, a transmission/distribution module, and a spot-pricing module.

- The *supply module* projects production based on analysis of U.S. reserve data, exploratory and development drilling, and technological progress. A simulation block for investigating supply responses under alternative assumptions is part of this module.
- The *transmission/distribution module* projects cost by customer class.
- The *spot-pricing model* integrates the results of the End-User Demand Model, the natural gas demand by the power sector from the Electric Power Model, and the embedded supply and transmission/distribution modules to determine producer prices by basin. A conclusive solution is developed through an interactive process.

Coal Model. The Coal Model is a simulation model designed to replicate the market response of this sector under alternative scenarios. Finalized through the interactive process, the baseline market analysis is provided by JD Energy (a coal and power consulting firm) that includes analysis and forecasts of coal production, rail costs, coal flows, and coal prices.

Electric Power Model. The U.S. Electric Power Model is a detailed, regional (census region) model

of the power-generation sector combined with a more aggregate module of the regional transmission and distribution sector.

The preliminary demand for regional generation is determined as a function of the demand for electricity determined in the End-User Demand Model, transmission losses, and trade. Generation requirements are met through the capacity module, which projects capacity decisions based on fuel prices, operating and maintenance costs, and technological progress. Usage is projected as a function of the amount of electricity generated and marginal production cost. Through this analysis, a preliminary demand for a specific fuel by the power sector is developed that is finalized in the iterative process.

Energy Balances Model. The Energy Balances Model completes the process. This model provides national and regional summations of energy use across all fuel types and customer classes.

Operation of the Energy Models. The ANPR implies very aggressive carbon-reduction targets between 2012 and 2050. Most proposed legislation allows offsets to achieve the target CO_2 reductions. We assume that EPA regulation of CO_2 emissions would target actual reductions equivalent to those required beyond the allowed offsets in legislation, such as the Lieberman–Warner bill. That is, we assume that the regulatory regime allows 30 percent of the reductions to come from non-domestic-energy reductions.

Global Insight Long-Term U.S. Macroeconomic Model

The Global Insight (GI) long-term U.S. macroeconomic model is a large-scale 30-year (120-quarter) macroeconometric model of the U.S. economy. It is used primarily for commercial forecasting.

Over the years, analysts at The Heritage Foundation's Center for Data Analysis have worked with economists at Global Insight to adapt the GI model to policy analysis. In simulations, CDA analysts use the GI model to evaluate the effects of policy changes not only on disposable income and consumption in the short run, but also on the economy's long-run potential. They can do so because the GI model imposes the long-run structure of a neoclassical growth model, but makes short-run fluctuations in aggregate demand a focus of analysis.

The Global Insight model can be used to forecast more than 1,400 macroeconomic aggregates. Those aggregates describe final demand, aggregate supply, incomes, industry production, interest rates, and financial flows in the U.S. economy. The GI model includes such a wealth of information about the effects of important changes in the economic and policy environment because it encompasses detailed modeling of consumer spending, residential and non-residential investment, government spending, personal and corporate incomes, federal (and state and local) tax revenues, trade flows, financial markets, inflation, and potential gross domestic product.

Consistent with the rational-expectations hypothesis, economic decision making in the GI model is generally forward-looking. In some cases, Global Insight assumes that expectations are largely a function of past experience and recent changes in the economy. Such a retroactive approach is used in the model because GI believes that expectations change little in advance of actual changes in the economic and policy variables about which economic decision makers form expectations.

Operation of the U.S. Macroeconomic Model

The policy changes implied by the ANPR and implemented in the U.S. Energy Model (as described above) resulted in more than 71 changes in the U.S. Macroeconomic Model. These changes ranged from energy-source variables (such as the price of West Texas Intermediate crude oil, an industry benchmark price series) to the carbon tax rate per ton of coal.[6] These energy-model results were introduced into the macro model in the following ways:

Energy Price Effects. Heritage Foundation analysts used the market price changes in the refiner's acquisition price for oil (West Texas Intermediate) and natural gas prices at the wellhead (Henry Hub) directly from the energy model.

The macro model contains a host of producer prices that are changed through their interaction with other variables in this model. However, the modeled policy changes affect producer prices in the energy sectors directly. Thus, the energy model's settings for these producer prices were used instead of those in the macro model. Technically, energy-producer prices were exogenous and driven by corresponding prices from the energy model. The following producer price categories were affected:

6. The specific year-by-year settings are available upon request from the Center for Data Analysis at The Heritage Foundation.

coal, natural gas, electricity, natural gas, petroleum products, and residual fuel oil.

We employed a similar procedure in implementing changes in consumer prices. In this case, the variables affected were all consumption-price deflators. Once again, we substituted energy-model settings for these variables for their macro-model counterparts. The following consumption price deflators were affected: fuel oil and coal, gasoline, electricity, and natural gas.

Energy Consumption Effects. Both the energy model and the macro model contain equations that predict changes in demand for energy, given changes in energy prices, but the energy model contains a more detailed treatment of demand. Preferring details over generality, we lined up the demand equations in both models and substituted settings from the energy model for those in the macro model. Specifically, we lined up these demand equations:

- Total energy consumption;
- Total end-use consumption for petroleum;
- Total end-use consumption for natural gas;
- Total end-use consumption for coal; and
- Total end-use consumption for electricity.

One key transformation that took place dealt with the differing demand units used between the two models in calculating residential consumption. The energy model expresses demand in trillions of British thermal units, while the macro model projects demand in billions of constant dollars.

Another key transformation focused on consumer spending on gasoline. The energy model does not contain a separate forecast for spending on gasoline or other motor fuels. To overcome this, we projected the change in consumer spending on gasoline based on the energy model's change in total highway fuel consumption.

Capital Spending. The energy model calculates capital spending by electric utilities in the base case and in the ANPR case. Spending is higher (at least initially) and costlier in the ANPR case because higher-cost power plants are built or because old plants are refurbished. The change in spending was applied to the macro model variable for inflation-adjusted spending on utility investment after conversion to the appropriate base year.

The analysts then calculated the amount of spending that would have been required to produce the same level of electricity capacity had the mix of spending been equivalent to the baseline. The purpose here is to measure the extra resources required for utility construction simply due to the introduction of the resources related to the carbon fee that will produce lower emissions, but which will not produce extra GDP.

APPENDIX B

Key Economic Indicators as a Result of EPA Regulations of CO_2 for Fiscal Years

	2010	2012	2014	2016	2018	2020	2022	2024	2026	2028	Average, 2010–2028
Gross Domestic Product, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	12,327.04	13,020.85	13,543.31	14,145.07	14,842.12	15,568.37	16,282.08	17,026.17	17,867.52	18,713.05	15,333.6
Baseline	12,387.67	13,071.89	13,686.38	14,359.66	15,074.29	15,841.21	16,622.62	17,437.99	18,313.72	19,204.34	15,600.0
Difference	-60.6	-51.0	-143.1	-214.6	-232.2	-272.8	-340.5	-411.8	-446.2	-491.3	-266.4
Real GDP Growth Rate, Percent Change from Previous Year											
Forecast	2.90	2.60	2.18	2.22	2.48	2.40	2.28	2.22	2.47	2.31	2.4
Baseline	2.95	2.65	2.34	2.46	2.51	2.52	2.45	2.42	2.48	2.39	2.5
Difference	0.0	-0.1	-0.2	-0.2	0.0	-0.1	-0.2	-0.2	0.0	-0.1	-0.1
Total Employment, In Thousands of Jobs											
Forecast	141,932.68	145,601.18	147,072.92	148,591.39	150,540.45	152,800.81	155,151.66	157,823.49	160,734.86	163,831.18	152,408.1
Baseline	142,258.70	145,562.10	147,565.05	149,396.78	151,223.65	153,376.22	155,839.57	158,585.77	161,348.52	164,238.18	152,939.5
Difference	-326	39	-492	-805	-683	-575	-688	-762	-614	-407	-531
Private Employment, In Thousands of Jobs											
Forecast	119,188.93	122,606.73	123,787.31	125,044.92	126,751.96	128,758.43	131,076.34	133,600.57	136,347.74	139,249.94	128,641.3
Baseline	119,516.38	122,595.88	124,327.90	125,908.13	127,508.50	129,418.00	131,848.75	134,460.61	137,077.08	139,807.43	129,246.9
Difference	-327	11	-541	-863	-757	-660	-772	-860	-729	-557	-606
Unemployment Rate, Percent of Civilian Labor Force											
Forecast	4.93	4.55	5.00	5.14	5.00	4.91	4.91	4.90	4.83	4.73	4.9
Baseline	4.83	4.56	4.73	4.73	4.70	4.68	4.68	4.69	4.70	4.71	4.7
Difference	0.1	0.0	0.3	0.4	0.3	0.2	0.2	0.2	0.1	0.0	0.2
Disposable Personal Income, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	9,448.51	10,050.03	10,560.09	11,137.08	11,789.38	12,482.04	13,162.35	13,851.65	14,589.41	15,367.94	12,243.8
Baseline	9,483.88	10,098.90	10,666.04	11,261.03	11,898.38	12,583.67	13,279.52	13,990.82	14,729.04	15,486.70	12,347.8
Difference	-35.4	-48.9	-106.0	-124.0	-109.0	-101.6	-117.2	-139.2	-139.6	-118.8	-104.0
Disposable Income Per Capita, In Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	30,460.69	31,851.29	32,906.25	34,130.44	35,543.04	37,031.60	38,434.51	39,810.49	41,270.97	42,790.80	36,423.0
Baseline	30,574.72	32,006.18	33,236.41	34,510.30	35,871.64	37,333.10	38,776.67	40,210.49	41,665.95	43,121.48	36,730.7
Difference Per Person	-114	-155	-330	-380	-329	-301	-342	-400	-395	-331	-308
Difference for Family of Four	-456	-620	-1,321	-1,519	-1,314	-1,206	-1,369	-1,600	-1,580	-1,323	-1,317
Personal Consumption Expenditures, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	8,813.70	9,333.26	9,714.49	10,143.69	10,656.25	11,175.02	11,683.58	12,186.96	12,708.26	13,246.79	10,966.2
Baseline	8,855.51	9,391.97	9,860.68	10,333.68	10,841.44	11,364.97	11,900.16	12,436.46	12,975.95	13,524.53	11,148.5
Difference	-41.8	-58.7	-146.2	-190.0	-185.2	-190.0	-216.6	-249.5	-267.7	-277.7	-182.3
Personal Savings, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	247.00	297.81	398.54	518.08	629.28	775.91	924.85	1,089.44	1,284.69	1,503.07	766.9
Baseline	239.50	288.17	355.28	447.53	549.49	684.74	821.72	974.29	1,151.59	1,340.02	685.2
Difference	7.5	9.6	43.3	70.5	79.8	91.2	103.1	115.2	133.1	163.0	81.6

Sources: Center for Data Analysis, Heritage Foundation calculations from the Global Insight macroeconomic model.

Appendix Table 1a • CDA 08-10 ☎ heritage.org

Other Economic Indicators as a Result of EPA Regulations of CO_2 for Fiscal Years

	2010	2012	2014	2016	2018	2020	2022	2024	2026	2028	Average, 2010–2028
Personal Savings Rate, Percent of Disposable Personal Income											
Forecast	2.66	3.04	3.88	4.79	5.50	6.40	7.24	8.10	9.06	10.04	6.1
Baseline	2.57	2.91	3.40	4.06	4.71	5.55	6.31	7.10	7.96	8.79	5.3
Difference	0.1	0.1	0.5	0.7	0.8	0.9	0.9	1.0	1.1	1.3	0.7
Gross Private Domestic Investment, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	1,891.77	2,103.47	2,175.66	2,292.28	2,442.08	2,601.20	2,744.81	2,926.02	3,186.09	3,426.25	2,579.0
Baseline	1,914.68	2,112.13	2,215.26	2,353.34	2,473.63	2,625.02	2,785.06	2,971.56	3,209.48	3,441.12	2,610.1
Difference	−22.9	−8.7	−39.6	−61.1	−31.6	−23.8	−40.2	−45.5	−23.4	−14.9	−31.2
Non-Residential Investment, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	1,472.25	1,605.35	1,693.16	1,794.92	1,940.65	2,109.66	2,274.11	2,475.52	2,728.92	3,017.05	2,111.2
Baseline	1,483.99	1,601.22	1,710.29	1,837.88	1,970.58	2,131.21	2,310.62	2,515.17	2,753.92	3,027.62	2,134.2
Difference	−11.7	4.1	−17.1	−43.0	−29.9	−21.5	−36.5	−39.6	−25.0	−10.6	−23.1
Residential Investment, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	418.75	497.97	497.52	515.23	525.34	532.87	533.78	538.07	559.02	560.10	517.9
Baseline	425.75	500.35	505.75	519.13	520.08	525.12	525.76	529.15	547.86	547.40	514.6
Difference	−7.0	−2.4	−8.2	−3.9	5.3	7.8	8.0	8.9	11.2	12.7	3.2
Change in the Stock of Business Inventories, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	33.84	29.62	22.76	25.28	31.93	32.54	32.37	34.79	48.70	47.16	33.9
Baseline	38.04	39.24	36.38	42.64	43.62	47.08	50.51	56.81	64.93	68.43	48.8
Difference	−4.2	−9.6	−13.6	−17.4	−11.7	−14.5	−18.1	−22.0	−16.2	−21.3	−14.9
Full-Employment Capital Stock, In Billions of Inflation-Adjusted Dollars Indexed to the 2000 Price Level											
Forecast	14,606.22	15,427.15	16,221.96	17,026.94	17,900.64	18,881.73	19,948.73	21,120.07	22,426.08	23,914.18	18,747.4
Baseline	14,628.96	15,462.23	16,287.68	17,130.28	18,021.74	19,000.86	20,083.74	21,276.69	22,596.89	24,065.68	18,855.5
Difference	−22.7	−35.1	−65.7	−103.3	−121.1	−119.1	−135.0	−156.6	−170.8	−151.5	−108.1
Consumer Price Index, Percent Change from Previous Year											
Forecast	1.87	2.79	2.71	2.45	2.24	2.12	2.11	2.10	2.18	2.23	2.3
Baseline	1.92	1.81	1.86	1.97	1.95	1.88	1.83	1.87	1.90	1.92	1.9
Difference	0.0	1.0	0.8	0.5	0.3	0.2	0.3	0.2	0.3	0.3	0.4
Treasury Bill, 3 Month, Annualized Percent											
Forecast	4.8	5.3	5.3	5.3	5.1	5.1	5.0	5.0	5.0	5.1	5.1
Baseline	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Difference	0.2	0.7	0.7	0.7	0.5	0.5	0.4	0.4	0.4	0.5	0.5
Treasury Bond, 10 Year, Annualized Percent											
Forecast	5.4	5.8	5.9	5.9	5.7	5.7	5.7	5.7	5.7	5.8	5.7
Baseline	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Difference	0.2	0.5	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.5

Sources: Center for Data Analysis, Heritage Foundation calculations from the Global Insight macroeconomic model.

Appendix Table 1b • CDA 08-10 ☎ heritage.org

Mr. KREUTZER. Thank you.

The damage to the economy is significant. The aggregate income loss as measured by gross domestic product over the period 2009 to 2029 is $6.8 trillion inflation-adjusted 2008 dollars: The job losses are also stunning. The manufacturing sector is especially hard hit, with job losses of nearly 3 million by the year 2029. Employment and machinery manufacturing and in rubber and plastic products and others drop by over 50 percent by that time. Of course, some of the unemployed manufacturing workers find jobs in the service sector, but not all of them. The net impact drops total employment for most years by more than 500,000 and in some years by over 800,000. All of these losses, by the way, are net of green job creation. A stimulus package should include provision to explicitly exempt carbon dioxide as a regulated pollutant under the Clean Air Act.

The second question is, what energy policies should be included in an economic stimulus package? A stimulus package should not constrain energy supplies, but allow them to expand and to include provision to maintain and increase access to energy resources of all kinds, but also those on the Outer Continental Shelf. We should keep moving forward to develop those resources. And while the bigger impacts of this policy may not come for several years or more, it should be emphasized that this part of the stimulus package does not cost the government anything and may well avert an economic crisis in the future.

The third question is, as it develops a stimulus package, what lessons can Congress learn from European policies on carbon emissions and energy? Some claim that programs forcing a move to a less carbon-intensive economy will actually stimulate the economy, create green jobs and increase income. The logic in supporting the analysis of these studies ignores the negative impact caused by diverting resources to green projects from other areas of the economy.

Since they are already pursuing many of these programs, Europe provides a lesson. Though many factors determine economic growth, stock market performance and unemployment rates, European performance in these areas does not argue for green stimulus or for creating energy security through conservation. In 2008, the FTSE Euro 100 index, a broad measure of the Euro area stock market, lost 47.3 percent of its value while the Dow Jones Industrial Index for the United States dropped less, that is by 33.9 percent. Their economic growth was smaller, and their unemployment rate was higher than in the U.S.

If European energy efficiency came from superior technology, we would expect to see lower energy prices than in the U.S.; instead, we see the opposite. The latest numbers for electricity costs show that household electricity prices are 50 to 200 percent higher in the European Union than in the United States, even for those European countries that lead the world in wind energy technology and use. Europe's lower carbon footprint seems driven more by demand-killing higher prices than by efficiencies of a new energy economy. The European Union can claim to be leaders in producing wind turbines and can point to the many jobs in the factories that build

them, but that doesn't mean their policies lead to a net job increase.

Evidence better supports a contrary conclusion, that green initiatives cost more jobs than they create. A stimulus package that forces a move to forms of uncompetitive forms of energy will raise costs and thwart economic growth. Instead, a stimulus package should focus on policies that reduce costs and make production and employment more profitable. Done.

[The statement of Mr. Kreutzer follows:]

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CONGRESSIONAL TESTIMONY

Energy Policies and Economic Stimulus

Testimony before
Select Committee on Energy Independence and Global Warming
United States House of Representatives

January 15, 2009

David W. Kreutzer, Ph.D.
Senior Policy Analyst in Energy Economics and Climate Change
Center for Data Analysis
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Mr. Chairman, I want to thank you and the members of the Select Committee on Energy Independence and Climate Change for this opportunity to address you.

My name is David Kreutzer. I am Senior Policy Analyst in Energy Economics and Climate Change at The Heritage Foundation. The views I express in this testimony are my own, and should not be construed as representing any official position of The Heritage Foundation.

Concern with the state of our economy is understandable; as is the desire to take action to improve it. The committee has asked me to address several questions regarding economic stimulus as it relates to energy and climate policies.

The first question
How would mandatory restrictions on carbon emissions affect the U.S. economy?

Roughly 75 percent of our energy comes from carbon-based fuels. Mandatory restrictions on carbon dioxide emissions restricts access to energy and drives up its price. In turn this reduces economic growth and destroys jobs.

Last summer, a colleague, Dr. Karen Campbell, and I analyzed the impact on the economy that would result from the higher energy prices if the Environmental Protection Agency regulates carbon dioxide as a Clean Air Act pollutant. I request that the resulting paper, "CO_2-Emission Cuts: The Economic Costs of the EPA's ANPR Regulations," be included in the record.[1]

In the study we investigate the economic impact of a program that reduces carbon dioxide emissions by 70 percent below the 2005 level by the year 2050. Due to the limits of economic models, we look only at the first 20 years of the program at which point the carbon dioxide levels will have been reduced by 30 percent.

The damage to the economy is significant. The aggregate income loss (Gross Domestic Product) over the period 2009 to 2029 is $6.8 trillion inflation-adjusted 2008 dollar.

The job losses are equally stunning. The mandated reductions in carbon dioxide hit the energy-intensive manufacturing sector especially hard with job losses of nearly 3 million in 2029. For some sub-sectors it is even worse. For instance, employment in machinery manufacturing and in rubber and plastic products drops by over 50 percent.

Some of the unemployed manufacturing workers find jobs in the service sector but the net impact drops total employment by over 800,000 jobs in some years. All of these losses are net of any "green" job creation.

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[1] David W. Kreutzer, and Campbell, Karen A., "CO2-Emission Cuts: The Economic Costs of the EPA's ANPR Regulations," Center for Data Analysis Report #08-10, October 29, 2008, The Heritage Foundation, http://www.heritage.org/Research/EnergyandEnvironment/cda08-10.cfm

In short, regulation or legislation that forces cuts in carbon dioxide emissions will severely harm the economy. Just the threat of regulation created by the Supreme Court's Massachusetts vs. EPA decision can be an anti-stimulus.

Firms' current investment decisions depend on the expectation of future profitability. So long as the EPA can impose draconian restrictions on carbon dioxide, even if the restrictions come with a delay of several years, firms will be less inclined to make job-creating investment this year.

A stimulus package should include provision to explicitly exempt carbon dioxide as a regulated pollutant under the Clean Air Act.

The second question
What energy policies should be included in an economic stimulus package?

The current economic crisis is complex. It is also widely spread across the globe. None of the more than 50 national and regional stock indexes listed in *The Economist* magazine was higher last week than at the end of 2007. In 2008 most of these indexes performed worse than the Dow Jones Industrial Average for the United States, which dropped by 33.9 percent.

One common problem faced worldwide in 2008 was the spike in energy costs. This spike only abated when the world economy went into a tailspin—a tailspin that, to some extent, was caused by the high energy prices.

A stimulus package should not constrain energy supplies but allow them to expand. The short-term impact on the economy comes directly from the investment of energy firms as the explore and develop energy resources and indirectly from the investment made by energy-using firms as they become more confident they won't be priced out of future energy markets.

A stimulus package should include provisions to maintain and increase access to energy resources such as those in the Outer Continental Shelf, the natural-gas deposits in shale, and the Artic National Wildlife Refuge.

While the bigger impacts of this policy may not come for several years or more, it should be emphasized that this part of a stimulus package costs the government nothing and may avert an economic crisis in the future.

The third question
As it develops a stimulus package, what lessons can Congress learn from European policies on carbon emissions and energy?

It has been asserted that financing various programs to force a move to a less carbon-intensive economy will actually stimulate the economy, create "green" jobs and increase income. The logic and supporting analysis for this line of reasoning ignores the negative

economic impact caused by diverting resources to the "green" projects and from any resulting higher energy costs.

Whether the government expenditure is financed by raising taxes, borrowing or even printing money, there is a cost to the economy. The value of products and services purchased needs to be at least equal to the expenditure. That is, spending a dollar for 80 cents of energy cannot be justified by arguing that it creates jobs.

Europe provides a lesson. Taxes, subsidies and other programs in the countries of the European Union have helped keep their per-capita carbon dioxide emissions to roughly half the level of that in the United States. In addition, because of expensive government programs, several countries—Denmark, Spain, Ireland and Germany—are world leaders in the fraction of electricity generated by wind power.

Though many factors determine economic growth, stock-market performance, and unemployment rates; European performance in these areas does not argue for "green" stimulus or for creating energy security through conservation.

As energy prices gyrated in 2008, the performance of the European Union's economies was not better than in the U.S. From the last week of 2007 until the first week of 2009, the FTSE Euro 100 index (a broad measure of the Euro area stock market) lost 47.3 percent of its value compared to a Dow Jones Industrial Index drop of 33.9 percent over the same period.[2]

The Gross Domestic Product for the Euro Area grew by .7 percent in 2008 compared to a growth of .9 percent in the U.S. In addition, the unemployment rate in the Euro Area was at least a percentage point higher than in the U.S. as of October.[3]

If European energy efficiency results from superior technology, we would expect to see lower energy prices than in the U.S. Instead, we see the opposite.

The latest numbers for electricity costs show that household electricity prices are 50 percent to 200 percent higher in the European Union than in the United States. This is even true for those European countries that lead the world in wind energy technology. The following table shows electricity costs and the percentage of electricity generated by wind in selected countries.[4]

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[2] *The Economist*, January 10, 2009, p. 86.
[3] *The Economist*, January 10, 2009, p. 85.
[4] Energy Information Administration website: http://www.eia.doe.gov/emeu/international/elecprih.html

Country	Percentage of Electricity from Wind	Cost per kilowatt-hour in U.S. dollars
Denmark	19	0.322
Spain	9	0.165
Ireland	9	0.244
Germany	6	0.222
United States	1	0.106

Though many factors affect electricity prices, the evidence from Europe indicates that their lower carbon footprint is driven more by demand-killing higher prices than by efficiencies of a new-energy economy.

The European Union can claim to be leaders in producing wind turbines and can point to the many jobs in the factories that build them. But, that doesn't mean that subsidies, tax credits and renewable fuel standards led to a net job increase. The overall EU unemployment rates compared to that in the U.S. would better support a contrary conclusion—that green initiatives cost more jobs than they created.

A stimulus package cannot include programs that fail a straight-forward cost-benefit test. This is just as true for "green" programs as for any other. Programs that fail the cost-benefit test take current resources away from more productive use negating any overall economic benefit.

Conclusion

Legislation and regulations that restrict access to affordable energy will undermine the economy as it works to create jobs and growth. In a similar way, forcing a move to uncompetitive forms of energy also raises costs that thwart economic growth.

Instead, a stimulus package should focus on policies that reduce costs and make production and employment more profitable.

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The CHAIRMAN. Thank you, Mr. Kreutzer.

And our final witness is Trevor Houser, who is a visiting professor at the Peterson Institute for International Economics.

We welcome you, sir.

STATEMENT OF TREVOR HOUSER, VISITING FELLOW, PETERSON INSTITUTE FOR INTERNATIONAL ECONOMICS, DIRECTOR, ENERGY AND CLIMATE PRACTICE, RHODIUM GROUP LLC

Mr. HOUSER. Thanks very much, Mr. Chairman, and members of the committee. I thank you for inviting me to testify on this important and timely topic.

My name is Trevor Houser, and I am a visiting fellow at the Peterson Institute for International Economics and director of the Energy and Climate Practice at the Rhodium Group, an economic research firm based in New York.

Last year the Peterson Institute, in partnership with the World Resources Institute, launched a multi-year initiative to examine the economic trade and financial effects of energy and climate policy. Our initial effort, "Leveling the Carbon Playing Field," was published last May and was the first in a series of reports we will be releasing between now and the international climate negotiations in Copenhagen later this year.

As the 111th Congress and President-elect Obama begin to work this month on drafting an economic stimulus package, there was an interest reflected in the opening statements of members in this committee in directing government spending in a way that not only generates near-term economic growth and employment but also addresses long-term policy goals. Energy and environmental objectives, including reducing carbon dioxide emissions and dependence on foreign oil, are chief among these, and the notion of a green stimulus package has gained considerable traction among policy makers and attention in the press.

A Wall Street Journal/NBC poll that was released yesterday indicates that public support is strongest for prospective energy and environmental components of a stimulus plan. Given the speed at which an economic recovery package is being drafted, there is a need for a frame work to help legislators evaluate which policies and programs to include in order to meet both the immediate and long-term policy goals. In a forthcoming report from the Peterson Institute, my colleagues and I assess a range of policy design options currently being considered in terms of their energy and environmental as well economic impact.

In my testimony today, I would like to share some of the key findings of our study, and I am happy to follow up with members of the committee after the hearing to provide more detail on the work. I also have considerable more detail in the written testimony that was submitted. The study finds that well-tailored energy programs as part of a recovery package can create jobs and stimulate the economy while achieving significant cost savings for businesses, consumers and the government. At the same time, it is clear that $100 to $150 billion in energy-related investment today is far from sufficient to meet long-term energy security and climate change goals.

Green elements of a recovery package, however, can complement forthcoming energy and climate policy by focusing on four things: First would be market failures, opportunities to reduce energy demand and CO_2 emissions through energy efficiency that will not likely respond to price-based energy or climate policies alone. The second is energy security, as market based climate policy aimed at reducing CO_2 emissions, such as a cap-and-trade program or carbon tax, does not necessarily reduce dependence on foreign sources of energy. The third is technology hurdles, as uncertainty about the availability of critical low-carbon energy technology between 2012 and 2030 creates anxiety about the future cost of climate policy. And the fourth is infrastructure bottlenecks. In addition to reducing costs, the deployment of low-carbon technology depends on the availability of enabling infrastructure. Whether electricity transmission, CO_2 pipelines or mass transit, the government will necessarily have a role in building and regulating that infrastructure that facilitates a low-carbon economy.

So with these principles in mind, let me provide some specific results from our analysis. And I think we have a chart up here. I like to hold off on the bubble charts until I get to that point as people's attention immediately diverts from what I have to say. So let me walk you through what this shows here. So we modeled 10 different energy stimulus policy scenarios. And so on the Y axis here, it is a change in U.S. energy imports over the base case as projected by the Department of Energy in their annual energy outlook released in December. It is important to note that this includes both natural gas and oil imports. And in fact, in most of the scenarios, the decrease in energy imports is in the form of natural gas. On the X axis, we have a change in annual CO_2 emissions on average between 2012 and 2020. And that is measured in million tons of CO_2.

The size of the bubble indicates the number of jobs created 2009 to 2011. And what we include in here is both the direct jobs in the industry getting investment, the indirect jobs in supply chains, the induced jobs when the wages are spent, and the fourth category, which hasn't been included as much in studies to date, is the jobs created by the energy efficiency savings, which was referenced by a couple of members on the committee.

We subtract from that jobs lost in fossil-fuel industry by lower spending on oil, gas and electric power to create a sense of the net. Again, this is just for 2009 to 2011. We did similar analysis what the long-term job implications would be, which I am happy to share with the committee later.

So some headline findings, investments in building efficiency hold the most promise for near-term job creation and long-run reductions in energy imports and CO_2 emissions. Spending $10 million to weatherize homes and retrofit Federal buildings would create and sustain up to 100,000 jobs between 2009 and 2011, and save the economy between $1.4 to $3.1 billion a year between 2012 and 2020.

Incentives for renewable energy can yield comparable energy savings and large emission reductions but with more uncertainty. Extending the production tax credit would stimulate an additional

gigawatts of wind power capacity construction over business as usual between now and 2014.

The CHAIRMAN. I am going to have to ask you to summarize, and then we have a Question and Answer Period, and we can come back to you.

Mr. HOUSER. So let me wrap up. The one note I would want to leave you with is, when considering green stimulus items versus other items in the stimulus package, the one component that people haven't considered is the long-term implications of energy savings. Money we borrow today will have to be paid back down the road. And the long-term revenue both to government, to households and in job creation can help offset some of those costs.

[The statement of Mr. Houser follows:]

Structuring a Green Recovery: Evaluating Policy Options for an Economic Stimulus Package

Trevor Houser
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Director, Energy & Climate Practice, Rhodium Group LLC

Testimony before the Select Committee on Energy Independence and Global Warming
US House of Representatives

January 15, 2009

Summary

- A well-designed recovery package can create jobs and stimulate the economy while cutting CO2 emissions and reducing dependence on foreign sources of energy. Energy savings for businesses, consumers and the government can play an important role in offsetting the cost of the stimulus package on tax payers and the economy down the road.

- Investments in building efficiency hold the most promise for both near-term job creation and long-run reductions in energy imports and CO2 emissions. Spending $10 billion to weatherize homes or retrofit federal buildings would create and sustain up to 100,000 jobs between 2009 and 2011 and save the economy $1.4 to $3.1 billion a year between 2012 and 2020.

- Incentives for renewable energy can yield comparable energy savings and larger emission reductions, but with more uncertainty. Extending the Production Tax Credit (PTC) would stimulate an additional 16 GW of wind power capacity construction over "business-as-usual" between now and 2014 at a cost to the federal government of $11 billion, assuming that tax credits are made refundable and wind power project developers have adequate access to capital. This would cut CO2 emissions by 8 million tons per year and reduce energy imports by 9 million barrels of oil equivalent.

- Transportation sector investments and tax credits have considerable job creation potential (particularly mass transit infrastructure) but more modest energy and environmental benefits, at least in the medium term. Broad-based "smart grid" deployment could yield massive energy savings, though only a small portion can reasonable be achieved as part of a stimulus plan.

- Spending $100 billion on energy and environmental programs over the next 2-3 years is not sufficient to meet long-term US energy security and climate change goals. Policymakers should seek a recovery package that complements forthcoming energy and climate legislation rather than replaces it. This includes understanding how stimulus programs not directly energy focused (like road, highway and bridge construction) will impact energy outcomes.

Testimony

Mr. Chairman and members of the Committee, thank you for inviting me to testify on this important and timely topic. My name is Trevor Houser and I'm a Visiting Fellow at the Peterson Institute for International Economics and Director of the Energy and Climate Practice at the Rhodium Group (RHG), an economic research firm based in New York. Last year the Peterson Institute, in partnership with the World Resources Institute, launched a multi-year initiative to examine the economic, trade and financial effects of energy and climate policy. Our first effort under this initiative, "Leveling the Carbon Playing Field" was published last May and was the first of a series of reports we will be releasing between now and the international climate negotiations in Copenhagen later this year.

As the 111th Congress begins this month, drafting an economic stimulus plan is at the top if the legislative agenda. Both Congressional leaders and President-elect Barack Obama have expressed a desire to direct government spending in a way that not only generates near term economic growth and employment but also addresses long-term policy goals. Energy and environmental objectives including reducing carbon-dioxide emissions and dependence on foreign oil are chief among these and the notion of a "green" stimulus package has gained considerable traction among policymakers and attention in the press. Given the speed at which an economic recovery plan is being drafted, there is need for a framework that helps legislators evaluate which policies and programs to include in order to meet both immediate and longer-term policy goals. In a forthcoming report from the Peterson Institute for International Economics, my co-author Shashank Mohan and I assess a range of policy design options currently being considered in terms of their energy and environmental, as well as economic impact. In my testimony today I'd like to share some of the key findings from our study and am happy to follow up with members of the Committee after the hearing to provide more detail on our work.

Framework: What Makes for a Green Economic Recovery

An economic stimulus package of the scale currently being considered will necessarily include a broad range of elements, from tax cuts for households to assistance to states to direct government investment in infrastructure, education and healthcare. Our study assesses twelve energy-related programs that could be included in that list, accounting for between $100 and $150 billion in government spending combined. These twelve programs are evaluated in terms of:

- **Speed:** how quickly the program can be implemented at scale
- **Jobs:** the number of direct, indirect and induced jobs created
- **Energy Prices:** the impact on energy demand and prices for the economy as a whole
- **Climate Change:** the ability to cut greenhouse gas emissions and thus the cost of future climate policy
- **Energy Security:** reduction in US dependence on imported fossil fuels

The study finds that well-tailored energy programs as part of a recovery package can create jobs and stimulate the economy while achieving significant energy cost savings for businesses, consumers and the government. At the same time, it is clear that $100 to $150 billion in energy-related investment

today is not sufficient to meet long-term US energy security and climate change goals. Green elements of a recovery package, however, can complement forthcoming energy and climate policy by focusing on:

- **Market Failures:** there are a number of low-cost (or even profitable) opportunities to reduce energy demand and CO2 emissions through energy efficiency that will not likely respond to price-based energy or climate policies alone. Targeted government spending can address these market failures and complement future policy.
- **Energy Security:** market-based policy aimed at reducing GHG emissions, such as a cap-and-trade program or carbon tax, does not necessarily reduce dependence on foreign sources of energy. Tax policy and strategic government investment can be used to ensure that climate policy helps achieve energy security goals as well.
- **Technology Hurdles:** uncertainty about the availability of critical low-carbon energy technology between 2012 and 2030 creates anxiety about the future cost of climate policy. Policy adopted today can help accelerate technology development and cut the cost of reducing emissions down the road.
- **Infrastructure Bottlenecks:** in addition to reduced cost, the deployment of low-carbon technology depends on the availability of enabling infrastructure. Whether electricity transmission, CO2 pipelines or mass transit, the government will necessarily have a role in building and regulating the infrastructure that facilitates a low-carbon economy. Many of those investments can begin today.

While the "green" programs evaluated in our study would have a direct impact on US energy demand and carbon emissions, other potential elements of an economic recovery package can do so as well. A significant amount of the close to $1 trillion in stimulus being considered will likely go to improving and expanding roads, bridges and highways. Our study evaluates investments that, while not conceived as energy and environmental programs, would have a meaningful impact on the country's energy and environmental footprint.

Methodology: Modeling Energy, Emissions and Economic Impact

To assess the energy and environmental impact of the twelve "green recovery" programs included in our study, we used the Energy Information Administration's National Energy Modeling System (NEMS). With its extremely detailed model of the energy impacts of US consumer and business behavior both by region of the country and sector of the economy, NEMS is seen as the preeminent tool for forecasting US energy demand and is used to create the Department of Energy's official Annual Energy Outlook (AEO) each year.

We have modified NEMS to simulate each program included in the study.[1] We modeled our policy scenarios using the just released AEO 2009 version of NEMS to capture recent changes in policy,

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[1] Documentation on the National Energy Modeling System (NEMS) is available on the Energy Information Administration's web site at http://www.eia.doe.gov/oiaf/aeo/overview/index.html. A full description of how NEMS assumptions were changed to model each stimulus policy scenario is provided in our full report.

energy prices and technology costs.[2] We also modeled each scenario using EIA's modifications to the NEMS model last year to simulate the impact of the Lieberman-Warner Climate Security Act (S.2191).[3] This allows for an assessment of how programs included in a green recovery package would impact the cost and contours of climate policy down the road.

Estimates of the employment impact of each program included in the study were made using the input-output tables from the Department of Commerce's Bureau of Economic Analysis (BEA). This approach allows for an assessment of direct employment effects (jobs created in the industry receiving stimulus spending) indirect employment effects (jobs created in supplier industries) and induced employment effects (jobs created when new direct and indirect hires spend their wages).[4] The use of the NEMS model also allows us to evaluate the employment impact of energy cost savings to households, firms and the federal government (as well as the corresponding reduction in revenue to the energy industry) resulting from each scenario.

It's important to keep in mind that the NEMS model is a tool for evaluating possible scenarios, not forecasting definitive outcomes. Energy markets are impacted by myriad elements that are volatile in nature. Each year, changes in energy prices, policy, consumer behavior and technology costs result in significant revisions to previous Annual Energy Outlooks. The same is true with our employment analysis, which is intended to measure potential job creation under normal circumstances with all other variables held constant. Our hope is that this report will help policymakers evaluate the relative merits of prospective economic stimulus programs, rather than serve as a forecasting tool.

Scenarios: Potential Green Recovery Programs

The policy scenarios analyzed in the report were drawn from conversations with policymakers, NGOs, industry groups and academics in November and December of 2008 about what types of programs are being advocated for and considered as part of an economic stimulus package. We opted for a representative set of policy proposals rather than an exhaustive list of possible options. The report does not recommend any for inclusion in a recovery package but evaluates them against the metrics outlined above. Below is a brief description of each. The cost of each program, as well as the energy, environmental and economic results of our analysis are described in Figure 1 and Table 1.

1. **Household Weatherization:** improving the efficiency of 7.5 million homes in New England and the Midwest.

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[2] Available online from the Energy Information Administration at http://www.eia.doe.gov/oiaf/aeo/index.html. AEO 2009 includes policy changes in the Emergency Economic Stabilization Act of 2008.

[3] Available online from the Energy Information Administration at http://www.eia.doe.gov/oiaf/servicerpt/s2191/index.html

[4] The Bureau of Economic Analysis's RIMS II multipliers are available online at http://www.bea.gov/bea/regional/rims/. Where pre-defined BEA industry categories were too aggregated, we made adjustments based on industry surveys. For different forms of power generation, we used estimates from the National Renewable Energy Laboratory's JEDI database (http://www.nrel.gov/analysis/jedi/about_jedi.html).

2. **Federal Building Efficiency:** reducing energy demand in federal buildings by 20% through retrofits.
3. **Green Schools:** providing funding to ensure all new school construction and major renovation is high efficiency.
4. **Production Tax Credit:** extending the PTC for renewable energy at the current rate through 2014.
5. **Investment Tax Credit:** increasing the ITC for renewable energy (residential, commercial and utility-scale) to 50% (currently 10%-30%).
6. **CCS Demonstration Projects:** funding ten 500 MW carbon capture and storage (CCS) demonstration projects around the country.
7. **Cash for Clunkers:** providing a $2500 tax credit towards the purchase of a new vehicle when a car 13 years or older is retired between 2009 and 2011.[5]
8. **Hybrid Tax Credit:** providing a $2500 tax credit for the purchase of a hybrid vehicle between 2009 and 2011.
9. **Mass Transit Investment:** providing $10 billion for "shovel ready" mass transit projects. To complement this assessment we also have the impact of $10 billion and $100 billion in investment in roads and highways.
10. **Battery R&D:** strategic investment in the research, development and deployment of advanced battery systems aimed at meeting FreedomCAR goals for reducing cost and weight.
11. **Smart Grid:** facilitating an upgrading of electrical grid technology through tax credits, matching funds and R&D investment.
12. **Transmission:** Construct 12,000 miles of high-voltage transmission to allow for greater renewable energy penetration.

The two electrical grid scenarios represent a complex suite of public and private sector actions, rather than a targeted policy intervention. As such, we were not able to model them reliably using NEMS. Instead, we provide a more qualitative analysis based on a review of existing research.

Headline Results

The twelve programs listed above vary considerably in implementation time, impact on the economy and employment, cost certainty and compatibility with future energy and environmental policy. I will focus on a few key findings we think are useful in informing the current policy discussion. The

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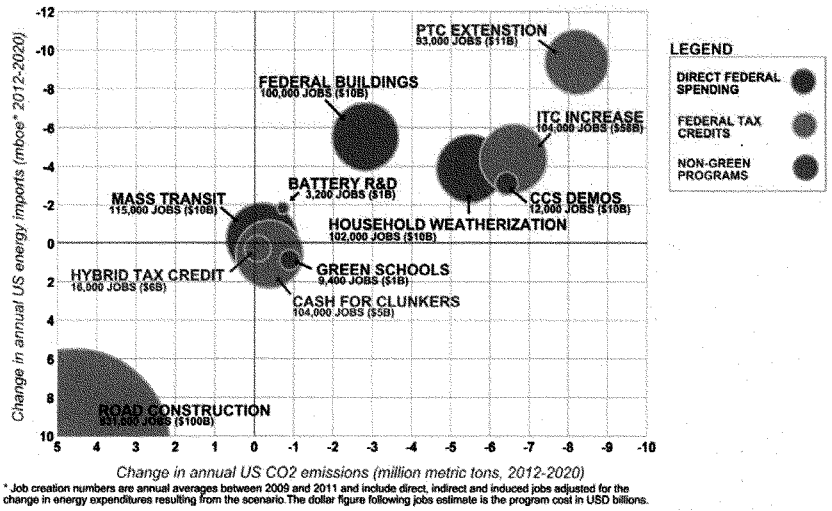
[5] We based our "Cash for Clunkers" scenario on a report by the Center for American Progress which assumes that a $2500 tax credit for retiring vehicles 13 years and older would result in 2 million passenger vehicles taken off the roads (see "Cash for Clunkers", November 2008, Center for American Progress, Washington DC, available online at http://www.americanprogressaction.org/issues/2008/cash_for_clunkers.html). We assume that half of the drivers trading in old cars would have purchased a new vehicle regardless (see J. Dill, 2004, "Estimating emissions reductions from accelerated vehicle retirement programs," Transportation Research Part D: Transport and Environment 9(2): 87-106 for a discussion of consumer response to "cash for clunkers" programs) and that there was no limitation placed on the type of new vehicle purchased.

impact of all ten modeled scenarios in terms of employment, energy imports and CO2 emissions is depicted in Figure 1. The horizontal axis indicates change in average annual CO2 emissions between 2012 and 2020 with the right-hand side of the chart corresponding to a net emissions decrease. The vertical axis indicates change in imports of all primary energy products (coal, oil and gas), measured in million barrels of oil equivalent per year. In our scenarios, most of this reduction comes in the form of natural gas, rather than oil, through a decline in gas consumption either in buildings or power plants. The size of the bubble reflects the number of direct, indirect and induced jobs created and sustained between 2009 and 2011.

Figure 1: Assessing Green Recovery Policy Options

Impact on CO2 emissions (X-axis), energy imports (Y-axis) and job creation (circle size)*



* Job creation numbers are annual averages between 2009 and 2011 and include direct, indirect and induced jobs adjusted for the change in energy expenditures resulting from the scenario.The dollar figure following jobs estimate is the program cost in USD billions.

** Energy imports include oil, gas and coal measured in million barrels of oil equivalent (mboe)

Building Efficiency

Direct government investment in energy efficiency can have immediate economic and employment impacts, yield significant energy cost savings and compliment future climate policy by addressing market failures. Our Household Weatherization scenario, at a cost of $10 billion in federal expenditures, cuts CO2 emissions by 5.5 million tons and reduces energy imports by 3.9 million barrels of oil equivalent (mboe) per year. The program would, on net, create 24,000 jobs in the construction industry (direct jobs) and 16,000 jobs in supporting industries (indirect jobs). The 7.5 million households weatherized receive roughly $700 million per year and the economy as a whole saves an additional $650 million a year in lower energy prices. These cost savings, if spent elsewhere in the economy, would create an additional 44,000 jobs. Added to the 25,000 jobs created when those employed directly and indirectly by the program spend their paychecks (induced jobs) and the scenario could result in up to 102,000 jobs created and sustained between 2009 and 2011. While the

construction jobs would fall off after that, the energy savings would continue, extending 35,000 jobs through 2020.[6]

Retrofitting federal buildings yields similar results. At a cost of $10 billion, energy imports are reduced by 5.5 mboe and CO2 emissions cut by 2.8 million tons per year. The federal government saves around $1.6 billion per year on energy purchases and the economy as a whole cuts costs by and extra $1.5 billion a year. If avoided government spending is passed through to the consumer in the form of lower taxes, 26,000 jobs are sustained between 2012 and 2020. Covering the incremental cost of making all new and renovated schools green is a less ambitious undertaking, costing $1 billion in our scenario, but could be extended to include retrofits similar to the Federal Building Efficiency program.[7] At a similar level of spending, job creation, energy savings and emission reductions would be in the same range.

Renewable Incentives

Our two renewables scenarios, extending the Production Tax Credit (PTC) and increasing the Investment Tax Credit (ITC), have the potential to result in even larger energy savings and emission reductions, but with more uncertainty. Assuming that tax credits are an effective tool for incentivizing wind power development in the current economic climate, extending the PTC would stimulate an additional 16 GW of wind power capacity construction over "business-as-usual" between now and 2014. Providing a 2.1 cent tax credit for each kilowatt hour produced by this capacity for the first ten years, as well as the 5.9 GW that is projected to be added without an extension, would cost just under $11 billion. Increasing the ITC from 30% to 50% would nearly triple the rate of installation of solar panels on homes and businesses, resulting in 24 GW of new capacity between now and when the ITC is schedule to expire in 2017. This capacity expansion would come at a considerably higher price than the PTC. Using EIA's capital cost estimates, increasing the ITC would cost the government $58 billion more than the $20 billion projected under the reference scenario.

Both the ITC and PTC scenarios would create roughly 100,000 direct, indirect and induced jobs between 2009 and 2011.[8] With the tax credits extending beyond this window, both would continue to create a considerable number of jobs until they expire. For the ITC scenario, this could be as high as 255,000 jobs between 2012 and 2020 (including jobs created through energy savings).

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[6] Estimates of the cost and energy savings of weatherizing individual homes are drawn from Oak Ridge National Laboratory assessments of the Department of Energy's Weatherization Assistance Program. These results are then modeled through NEMS to assess economy-wide energy impacts.

[7] Estimates of the cost and energy savings of retrofitting federal buildings are drawn from the Department of Energy's Federal Energy Management Program. These results are then modeled through NEMS to assess economy-wide energy impacts.

[8] Jobs estimates for renewables assume 100% local content. While the US ran fairly balanced trade in solar panels in 2007 (http://www.eia.doe.gov/cneaf/solar.renewables/page/solarreport/table3_12.html and (http://www.eia.doe.gov/cneaf/solar.renewables/page/solarreport/table3_14.html) this may not be the case in the years ahead.

Transport

Compared to building efficiency and renewable energy, our transport scenarios have considerably less impact on energy demand and CO2 emissions. Neither Cash for Clunkers nor the Hybrid Tax Credit created a noticeable change in the country's energy or environmental trajectory. In the "Cash for Clunkers" scenario, this is because in the NEMS model, old vehicles aren't driven as much as new vehicles, so total vehicle-miles-traveled increases as a result of the program. When looking to reduce environmental pollutants like SO2 and NOX, this effect is small in comparison to the reduction in emissions achieved by upgrading the vehicle stock. But in terms of fuel economy, and thus CO2 emissions, the vehicle fleet of 13 years ago didn't look too much different than the vehicle fleet of today. The effectiveness of a Cash for Clunkers program could be improved by limiting new purchases to high efficiency vehicles, but would still fall far short of our previous scenarios in terms of energy savings and CO2 emission reductions.

The Hybrid Tax Credit doubles projected hybrid sales to 2.5 million between 2009 and 2011. But in the NEMS model, many of these hybrid purchases come at the expense of ethanol-powered flex-fuel vehicles, diminishing much of the energy and emissions benefit. Both Cash for Clunkers and the Hybrid Tax Credit scenarios assume traditional consumer response to tax incentives which might not be applicable in the current economic environment. The Battery R&D scenario, on the other hand, is direct government investment in research and development. Reducing battery cost and weight holds the promise of making plug-in hybrids competitive with conventional vehicles and significantly altering the energy profile of the transportation sector over the long-term.[9] We assume that $1 billion in research investment would enable DOE, in conjunction with private sector partners, to meet the FreedomCAR battery cost targets by 2015. In the model, this causes plug-in hybrid sales to jump to 390,000 a year by 2020, 170,000 more than in the reference case. This modest start towards broad-based plug-in hybrid penetration reduces oil imports by 2 million barrels a year.[10]

Investing $10 billion in mass transit yields relatively modest energy and environmental improvements but significant job creation. In our scenario, the transit investment is distributed proportionally to bus, light rail and heavy rail, and yields average levels of energy efficiency. Under this assumption, the energy demand increase from greater mass transit usage offsets about half the gains from lower vehicle miles traveled in passenger cars. The energy and environmental "bang for the buck" of mass transit spending increases if systems are designed to maximize energy efficiency.

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[9] See "Environmental Assessment of Plug-In Hybrid Electric Vehicles," July 2007, Electric Power Research Institute and Natural Resources Defense Council

[10] The AEO 2009 is the first version of NEMS model to include a detailed model of battery and plug-in hybrid (PHEV) costs. The approach adopted by EIA has yet to receive rigorous review as the AEO 2009 is still in early release. Therefore we adjusted our scenario based on findings in recent PHEV reports from the Electric Power Research Institute, Pacific Northwest National Laboratories and the American Council for an Energy-Efficient Economy.

Grid

"Smart grid" refers to a whole suite of technologies and applications that increase awareness of energy costs and improve the efficiency of transmission and distribution. While we were unable to model such a suite in NEMS, recent studies suggest that a "smart grid" broadly deployed can have major energy and environmental benefits. We took the estimates of what could be done independent of other policies in one such study[11] and updated them using the AEO 2009. We find that an aggressive program of "smart grid" deployment nation-wide could reduce energy costs by $12 billion to $35 billion and cut CO2 emissions by between 23 and 66 million tons a year between 2012 and 2020. "Smart grid" deployment is still in trial stages around the country and there are no reliable estimates available for what a comprehensive program would cost. A well-planned "smart grid" roll-out would take time, but select elements could be tackled during the 2009-2011 window. Construction crews could, for example, install new metering systems while performing household weatherization.

The cost of upgrading the transmission system to accommodate wide-spread deployment of renewables is better understood. DOE's National Renewables Energy Laboratory, for example, estimates that the 12,000 miles of new transmission lines needed to increase wind power penetration to 20% would cost $20 billion.[12] They calculate that this would decrease CO2 emissions by 84 million tons per year and reduce natural gas demand by 11%. New transmission lines could also potentially enable concentrated solar power in the Southwest to displace coal-fired power for base-load generation. Government action will be required to get these transmission lines planned, approved and sited, and the country's transmission needs will change over time as the nature of the power sector evolves. Given uncertainty about the future generation mix, there is little in the way of "shovel-ready" transmission projects waiting for stimulus funding. Policymakers should incorporate a longer time-horizon for grid investment and look to options like a national infrastructure bank.

Roads

Stacked up against our twelve "green" stimulus options is the potential for massive investment in the construction and repair of roads, bridges and highways. Our study finds that $100 billion in road investment would increase energy imports by 10.5 mboe and CO2 emissions by 4.6 million tons per year between 2012 and 2020.[13] This would cancel out the impact of the non-grid "green" scenarios by 42% and 14% respectively. The road investment scenario would create over 300,000 jobs directly in construction and 177,000 jobs in supporting industries. Energy expenditures increase by $4.3 billion, which results in a loss of 10,000 jobs between 2009 and 2011 and 5,000 jobs between 2012 and 2020 (though this may well be offset by increased productivity resulting from the infrastructure improvement).

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[11] See O. Siddiqui, June 2008, "The Green Grid: Energy Savings and Carbon Emissions Reductions Enabled by a Smart Grid," Electric Power Research Institute

[12] See "20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply," July 2008, National Renewable Energy Laboratory. Estimates are based on the AEO 2007

[13] Estimates of the impact of road investment on vehicle-miles traveled are drawn from the Federal Highway Administration's (FHWA) Highway Economic Requirements System (HERS).

Table 1: Comparing green recovery options (change over AEO 2009 reference case, preliminary results)

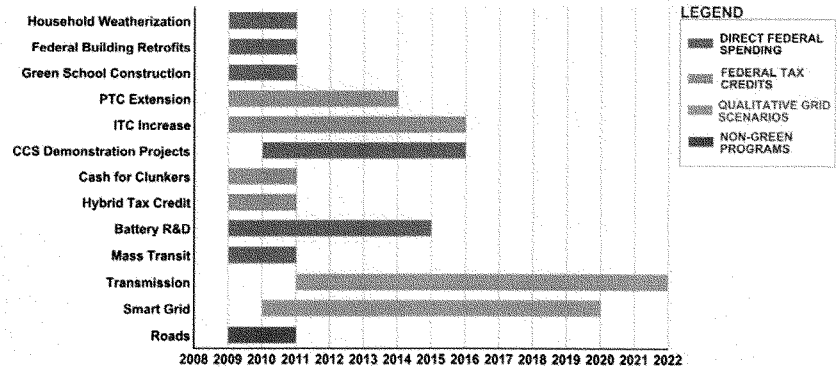
	Cost	Energy savings**	Employment***			
Green Programs	total cost in billion USD	Billion USD/year 2012-2020	Direct 2009-2011	Indirect 2009-2011	Wage induced 2009-2011	Efficiency induced 2009-2011
Household Weatherization	$10	$1.37	24,000	15,000	20,000	44,000
Federal Building Retrofits	$10	$3.10	25,000	16,000	25,000	35,000
Green School Construction	$1	$0.07	2,700	1,700	3,000	2,100
PTC Extension	$11*	$2.93	20,000	17,000	32,000	24,000
ITC Increase	$10*	$5.04	26,000	24,000	44,000	9,000
CCS Demonstration Projects	$10	$1.66	3,800	1,300	6,800	-
Cash for Clunkers	$5*	-	19,000	25,000	53,000	-
Hybrid Tax Credit	$6*	-	2,900	5,600	8,300	-
Battery R&D	$1	-	1,600	-1,200	2,700	-
Mass Transit	$10	-	41,000	24,000	49,000	-
Transmission	$20	NA	NA	NA	NA	NA
Smart Grid	NA	$12-$35	NA	NA	NA	NA
Other Programs						
Road Investment	*$100*	*-$4.26*	*303,000*	*177,000*	*362,000*	*-10,000*

* These programs are open-ended tax credits so the exact cost is unknown. Estimates here are based either on model results from AEO 2009 or assumptions from existing literature.

** Indicates savings in energy expenditures for the economy as a whole and have only been listed for scenarios where the finding was statistically significant.

*** Employment numbers are measured as the average number of jobs created and sustained between 2009 and 2011. This includes jobs lost in the energy sector as the result of improved efficiency but not the jobs lost as a result of higher tax rates to recoup the fiscal cost of green stimulus programs. Efficiency-induced jobs have only been listed for those programs where the change was considered statistically significant. Job estimates for changes in electricity generation capacity assume 100% domestic content for materials and technology.

Figure 2: Green Recovery Program Timelines
Start, stop and duration of policy scenarios included in the study



Conclusions and Policy Design Considerations

In seeking to implement any of the above programs as part of an economic recovery package, considerations should be made for how the current economic climate has impacted the utility of traditional policy tools. Tax credits are only useful if firms have a tax burden to reduce. The PTC and ITC scenarios will likely be less effective in changing firm behavior over the next two years than under normal circumstances. This can potentially be addressed by making the credits refundable. Even if firms are profitable, and thus have an appetite for tax credits, they may have trouble gaining access to finance. A federal lending facility for renewable projects could be an important compliment to tax incentives. On the consumer side, current retrenchment may not be undone simply by offering a $2500 credit towards the purchase of a new car. Estimates of the scale of impact of the Cash for Clunkers and Hybrid Tax Credit scenarios assume a normal environment and may need to be adjusted downward. Likewise, wages and energy cost savings to the household may be saved at a greater rate than normal, which would reduce the induced job estimates in this study. I've broken out the employment effects by type in Table 1 so you can apply your own assumptions about consumers' current propensity to save.

I would also urge the Committee to keep future climate legislation in mind when evaluating policy options for the current stimulus package. While the impact of the programs listed above on CO2 emissions are certainly meaningful in absolute terms, they fall far short of medium and long term emission reduction targets. The ten scenarios we modeled would cut emissions by 32 million tons per year on average between 2012 and 2020, a 0.5% reduction in the US total. In contrast, EIA estimates that the Lieberman-Warner Climate Security Act would reduce emissions by 484 million tons during the same period. "Green" components of a stimulus package should be seen as a segue into, not a replacement for, a cap-and-trade system or carbon tax.

Given that the programs assessed in our study are no substitute for climate policy, Congress should consider how proposed stimulus programs will interact with future climate regimes. Some of our scenarios, like the PTC extension, costs more and has less value if a price for carbon is introduced. Under the EIA's model of the Lieberman-Warner Climate Security Act, a PTC extension only increases wind capacity in 2020 by 12 GW (from 87 GW to 99 GW), but costs the government $41 billion, or four times the cost of the reference case scenario for an equivalent increase in generation capacity.[14] Other scenarios are enhanced by the imposition of carbon controls. CCS demonstration projects have a modest emissions benefit in and of themselves but are primarily a means of facilitating broader diffusion under a carbon-constrained future. Likewise, the extent to which greater plug-in hybrid penetration can reduce CO2 emissions depends on the ability of climate policy to move the power sector in a less carbon-intensive direction.

The same considerations hold for energy security. All together, our ten modeled scenarios decrease annual energy imports by 27 mboe, roughly 0.5% of the US total. And most of that reduction is in natural gas. A serious attempt to curtail dependency on foreign oil will require more comprehensive and aggressive policy. While a stimulus package can make an important start on both this and

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[14] The EIA model of Lieberman-Warner based on AEO 2008 data was updated to reflect current wind power capacity additions through the beginning of 2009.

emission reduction goals, Congress should be careful to include only those programs that will have a meaningful near-term economic impact and not conflict with long-term energy and environmental policy down the road.

Finally, when considering medium term employment implications of a prospective stimulus package, it's important to keep in mind that money borrowed to pay for stimulus programs will need to be repaid down the road, either through increased taxes or a cut in government services. The debt obligations incurred over the next 24 months will cost the economy jobs in the years that follow (though hopefully from a considerable higher base than would have occurred without the stimulus effort). The energy cost savings created through "green" components of a stimulus package have the potential to offset a considerable amount of this by redirecting consumer spending to more labor-intensive and locally produced goods and services over the long run.

Thank you for the opportunity to share our research with you and I look forward to your questions.

The CHAIRMAN. Thank you, Mr. Houser, very much. We will come back to you.

Now we are going to go to a question-and-answer period. I would like to have a conversation with our two mayors in terms of how they envision the stimulus package, as you have heard the outlines, impacting your cities and other cities in the country, and what the job creation potential is and what the transformative capacity is of these programs to really even change the way in which the cities think of themselves.

Could we begin with you, Mayor Nutter?

Mr. NUTTER. Mr. Chairman, thank you very much for the question.

I think there are two primary areas that I would draw attention to. The first is, as Mayor Palmer laid out and I have made the same case, and I raise this issue in my testimony, stimulus dollars coming directly to cities again with every respect to States, and you have to balance those interests, are dollars that are going to be immediately spent. We talk about—I heard a new term today, but I usually talk about shovel-ready, hammer-ready, money-ready, we heard about screw-diver-ready, and I am fine with that as well. That is a project that is 90 to 120 days, ready to go, can be completed in 2 years.

The stimulation, quite frankly, to our economy from the Federal resources does two big things. One, helps us to not take counterbalancing actions of our own because of the economic crisis in our cities. And by that I mean, a couple of months ago, I had to announce that we were laying people off from city government, which is unfortunately putting more people out of work while the Federal Government is trying to put people back to work; cutbacks in programs and services and the like. So you stop a number of bad things from happening with the stimulus dollars.

The second is, we are able to make the kind of investments that I talked about earlier in my testimony, and I know that Congressman Cleaver had to go, but I would lay out, for the record, his concern with regard to how quickly some people can be trained. I will tell you, in Philadelphia, there is a new job training program that has been developed by our Energy Coordinating Agency that will certify new weatherization specialists. Some of this training can be completed in as little as 2 weeks to get people ready to go and take on some of the challenges that are out there. Some programs may take longer. But there are many opportunities. Again, when you talk about what Van Jones is talking about in terms of green-collar jobs, these often are not jobs that take forever to get ready for.

So we can put people to work. We have the population. We have the projects. Literally, Mr. Chairman, and members of the committee, all we are lacking is the resources to make these projects happen and make them a reality.

The CHAIRMAN. Mayor Palmer, do you want to add to what Mayor Nutter just said?

Mr. PALMER. Absolutely, and just the best way to get people in the inner cities and the metro economies is to give people jobs. I, like Mayor Nutter, have the unfortunate task to make tough decisions, but we are laying off people in the City of Trenton. We talked about closing libraries, rec centers. It is something no mayor

would want to do, and we struggle with that. But we need to get our people back to work. And you can do it, as Van was saying, as being producers.

I will give you just a quick example of how you can take care of a number of things with stimulus money going direct to cities, which is a transparent process. In the City of Trenton, we have like many older northeast cities, problems with lead and how it affects our children and their ability to learn. We have estimated that we have about 4,000 homes in the City of Trenton that have lead problems. You can with stimulus dollars do two things. One, you can train people on how to abate all the houses that have lead problems, which help in terms of environmentally; all those houses at the same time be trained how to retrofit a lot of these homes as well, whether it is energy-efficient windows, whether it is thermostats or creating green or white roofs. Not only can you do that, but you are training people that are willing, ready and able to learn how to do those things. We are working with Public Service Electric and Gas, my city and Newark, for a training program with Isles and YouthBuild to do those kinds of things. When you look at retrofitting, public housing projects and getting the costs that you can measure, how much would it cost to reduce your energy efficiency in public housing, which has some of the largest buildings, New York City, for instance, or in Philadelphia or Trenton, Washington, D.C., get the cost of how much it will save in terms of energy, you can actually use that cost and, if the banks would give up the money, use that savings and get loans that you could retrofit public housing with the caveat as you are doing that to train the people that in public housing or around public housing or in the area code, to train those individuals for jobs.

The CHAIRMAN. So you are saying that, in a lot of these areas, these are ready-to-go jobs with limited, with not a lot of training necessary, that produce a huge benefit for your cities and get people off the rolls and into a job.

Mr. PALMER. And real quick, absolutely, we had the MainStreet, U.S. Conference of mayors did this MainStreet stimulus plan; 774 cities participated, projects that are shovel-ready in 2 years, because we have many more than that that are sustainable and will be able to be done right and get moving right away. So it is not pie in the sky. It is things that can help our economy and help our citizens.

The CHAIRMAN. Mr. Jones can you comment about what Mayor Nutter and Mayor Palmer just said? Just deal with the cities aspect of this if you could.

Mr. JONES. I would be happy to, and hopefully, we will get a chance to talk about the rural agenda as well, but just to talk about cities for one second. There is a great program called Solar Richmond very close to where we are. They take people that come from disadvantaged backgrounds and teach them how to become solar panel installers in 6 weeks. What people have to remember is when we are talking about green jobs, we are not talking about space-age George Jetson, Buck Rogers science-fiction jobs that no one has ever heard of. We are talking about very familiar trades. We are talking about very familiar kinds of work but upgraded and

upskilled to function in a more carbon constrained environment. The Green Jobs Act which——

The CHAIRMAN. Just give me an example. Let's take the Green Jobs Act. Let's look at Trenton and Philadelphia here for a second. Give us a couple examples of programs that, if we pass this package, will have an immediate impact on cities like Trenton and Philadelphia.

Mr. JONES. Sure, well, for instance, you take homes that are leaking energy, just to sort of go on your example whether public housing projects or frankly just regular homes. Most people are not going to—you can tell them all day if you wanted to that if you invested X amount of money, you will ultimately save $3,000, $20,000 on their energy bill. Most people do not have the ability to spend that $2,000 to $3,000 dollars right now. If you have a more collective approach, where we can actually deploy a workforce—look at the kind of jobs very low-skilled people can do right away. Energy auditing, knock on the door; you have a clip board. Knock on the door; you have a small laptop. You talk to that homeowner. You show them where they can make immediate improvements in terms of energy efficiency, but you also point out where a little bit more work—what is the next problem? Blowing and clean nontoxic insulation. That is a low-skilled job that can have an immediate impact that day on the heating and cooling cost of that building. What is next? Replacing windows that don't fit, doors that don't fit with high-performance windows and doors. Somebody has to make all those parts and bring them in. There is your manufacturing agenda that is getting ready to go. Replacing all those boilers and furnaces. Some are 20, 30 years old, incredibly inefficient, replacing them with new modern furnaces and boilers. You are going up the ladder now in terms of skill and training, and yet you can now retrofit homes with geothermal. You don't even need a boiler. These are the kind of things that have immediate, short-term effect in terms of stimulus to the economy but long-term effects in terms of savings and carbon reduction.

The CHAIRMAN. Let me come back to you again, Mayor Nutter and Mayor Palmer. What is your response to Mr. Jones in terms of how this would impact Philadelphia or Trenton?

Mr. NUTTER. Mr. Chairman, Mr. Jones is absolutely correct. We are doing about 5,000 homes a year in Philadelphia. If we were able to scale that up literally to about 100,000 houses, you will put thousands of people to work. You will dramatically lower the energy costs of those homeowners which, quite frankly, rather than the dollars going for energy resources, literally money back in their own pockets. We propose a program where for about $2,500 and in over 2 years, that homeowner would stay pretty much at the payment right that they have been making. We pay back those dollars into the fund and do more of this same kind of work, and after that point, the homeowner enjoys the benefits of significant 20- to 30-percent energy reduction costs. That is money literally going through the roof, out the door, rather than staying in their own pockets. This can work. It is the capitalization upfront of dollars that clearly here, that is the need, but I have got 400,000 flat roofs in Philadelphia. They are tar black roofs today. They can be pulled

or green later on and significantly reduce even the temperature in someone's home just by changing it, the tar roof.

Mr. JONES. That would be paint-brush ready.

The CHAIRMAN. Mayor Palmer.

Mr. PALMER. Absolutely. And mayors are leading the way, quite frankly, when the Federal Government didn't. Our good friend from Seattle, Washington, Mayor Greg Nickels signed up now and started with 120 mayors to sign our Climate Protection Agreement. We have over 900. We are doing it now, except we can't do it to the scale that we would like to do to the training and the retrofitting without an infusion of capital.

The other thing it will do, if you have seniors and others that are on fixed incomes or just got laid off that are hurting, they are choosing between now—it used to be fuel and; food, now it is their energy costs. You can reduce their energy costs. You can help sustain their homes. Another thing you can do is, Van was saying—Mayor Nutter so well knows—we have got—I am not trying to be political. People need hope. When they have a job and they are people that are now being trained and helping people reduce energy, they have hope. They have a job they can walk through the neighborhoods and be proud about. They are not knocking people over the heads. They are not doing other kinds of things and the other thing that will go——

The CHAIRMAN. Turn on your mike.

Mr. PALMER. It is on. The other thing they can do is become taxpayers as well, and so all of these things help. We can all be a part of this new recovery by making sure it is transparent, that we are all held accountable, and that is it is sustainable.

The CHAIRMAN. Thank you.

Chair recognizes the gentleman from Oregon, Mr. Blumenauer.

Mr. BLUMENAUER. Thank you.

I appreciate it, Mayor Nutter, where you were talking in a more comprehensive, way you talked about issues that were related for example to water quality as part of the economic stimulus, both in terms, perhaps, of the standards and the methodology. And I would put to you, actually to both our mayors, a request for you to help us as we work with the new administration to think about how we change the standards of the—and the relationship of the Federal partnership. A lot of it is prescriptive, having still scars that haven't healed entirely from trying to work with the previous administration when I was in your shoes, trying to negotiate agreements with EPA about spending a couple billion dollars much more effectively if we were greening it. And we found out that people just wouldn't accept the extent to which you, with the resources, with your fellow mayors, could help us develop alternative approaches for regulation where you would commit to, not just meet, but exceed the water quality standards, but we would cut a deal with you so that you could be more flexible, daylighting creeks, using maybe some investments upstream that would actually produce better water quality improvement than you spending massive sums for a river that is already polluted before it gets to you. Would you be willing to help us with your certified smart people that work with you to think about how we change those standards and give you some flexibility?

Mr. NUTTER. Yes. Absolutely, Congressman, this is some of the most important work that goes on in Philadelphia. We, again, not trying to brag too much about our great city, but the Philadelphia Water Department has been a leader in storm water management for a long, long period of time. And it is why I talked about it earlier. Sometimes, even though on the environmental side, when people talk about, well, we are just going to plant a lot of trees, and isn't that nice? I love trees as much the next person. It is not just about trees. It is the fact that the trees absorb water. We create pits around the trees to take more water; 90 percent of the major storms in Philadelphia result in about an inch or less of rain fall. Rather than that water going in our storm water management system, it should be going into pervious surfaces all over the City of Philadelphia. That is being smart about green and not investing in the old gray infrastructure as opposed to green infrastructure to deal with storm water management issues.

Mr. BLUMENAUER. You can help us, and I won't take time now. I have some other questions for other panelists, and I want to circle back to you where you can help us, so we can look at this comprehensively with the new administration.

You mentioned street trees, which deal with the heat island effect, the reduction of storm water runoff and actually some natural filtration, if we can think comprehensively so you can get multiple benefits and maybe move ahead of the line as we move this forward.

Mayor Palmer, you referenced, I think, a partnership with your local utility. And I am curious, and Mr. Jones may have some observations along this line, we have thousands of utilities, public and private, around the country, electric, gas sewer and water, that collectively probably the top 4,000 have a monthly relationship with probably, what, 95 percent of American business and households. They have a credit rating that is pretty good these days. They have established relationships and programs, and they work with subcontractors. Can you envision our being able to work, maybe in the next round of energy legislation that is coming, where we could develop partnerships where we could actually use on bill financing that wouldn't require massive Federal outlays, wouldn't require lots of actual approval and tax increases, but develop a partnership with those public and private utilities to finance deep green projects that would have a payback period that would be well within the scope of when they would pay it back, 3, 5, 10 years, maybe even the Federal Government and other government agencies negotiate a special rate to finance the deep green, not just energy efficiency, but it may actually be new construction or major reconstruction, have you given any thought to that? Does that of any potential, Mayors, Mr. Jones?

Mr. PALMER. It absolutely does, and that is one of the reasons why we were able to work with our Public Service Electric and Gas to come up with the pilot program to do those kinds of things. They did have to go to the Board of Public Utilities to get approval of what they wanted to do, but certainly, I think now is the time, and they are willing to make those kinds of investments.

The other thing, I just want to let you know that the U.S. Conference of Mayors and our president, Manny Diaz, wanted me to

let you know that the Conference of Mayors is ready to work with you even on the water. We have what is called the Mayors' Water Council, Mayor Diaz from Albuquerque and Mayor Coody from a town in Arkansas or Mississippi—he is going to kill me when he hears I don't—but I got his name right. But we talk about all kinds of issues, water, waste water, removing the volume cap for private activity bonds and a number of issues and that we are a great resource to help in that area and to work with you and this committee as we craft the kind of policy that will help us.

Mr. BLUMENAUER. Before I turn to Mr. Jones for elaboration, let me just posit one other item, because I am not sure we should be afraid of actually engaging our State, public regulatory commissions. Right now many people in the inner cities are disadvantaged because you are subsidizing sprawl and inefficient patterns of energy, the line loss. Maybe we should be looking at having a regulatory system that rewards efficiency that is sanctioned by the State, sort of get into wind energy and other alternatives here, but it is using existing mechanisms and the market.

Mr. NUTTER. Congressman, with your permission, just share two pieces of information from back home in Philadelphia. First PECO energy, the main energy company in Philadelphia, was a leader, is a leader, in green roof activity on one of their buildings in Philadelphia. One of the first green roofs for any corporation was done by PECO. Second, the city is working with PECO to reduce our total base load by 1 percent by 2011. And there is also a new State legislation in that regard. So when you raise the issue of States, States can absolutely have an impact here. That would result in 20 percent less electricity being used, equal to about 200,000 homes, right in the City of Philadelphia. So there are clear partnerships at the city, State and Federal level on all of these issues, and we would be, I would be pleased, I am sure Mayor Palmer and many others would be pleased to work directly with you and the Members of this committee and the Congress on these kinds of issues.

Mr. BLUMENAUER. I would love to follow up with you both in terms of the water and the utility partnership so we are able to magnify the Federal legislation in part, and Mr. Markey has got all sorts of leadership positions, and we may be able to convince him to have some Federal assistance and incentives for decoupling. And maybe on the Ways and Means Committee, we can find a little way to nudge that in terms of how they are treated financially.

Mr. Jones.

Mr. JONES. First of all, where have you been all my life, man? You had me at hello with that.

This is exactly where I think the next round is going to be. Our utility companies have to be partners with us at the local level to do the one thing we can do right now, which is to capture these energy cost savings and use them as a way to incent private capital. McKenzie did a study that shows that in 2 to 4 years, all the work we just ascribed around energy retrofits and weatherization can pay for itself in energy cost savings, which means essentially you are talking about, if you do everything the mayors just said, look what you just did? If you can recapture those cost savings by having on bill repayment like you said. If utilities companies would be partners with us, you get to bring up home values, bring down

unemployment, cut greenhouse gas emissions, clean up the air, reduce asthma, and it pays for itself. It is revenue neutral. We have a genius in this room named Jason Walsh, whom I want to brag on, and point out—who is the man blushing but Jason Walsh has actually taken your instinct and your insight and put together a proposal that would actually, for about $30 billion, let us weatherize and retrofit millions of buildings, put about 600,000 people to work. And because we are using revolving loan funds and loan guarantees, it would pay for itself. What we need is partnership with local utilities.

We can unlock the value. We have a choice, as the mayors said; the money can go out the roof, or it can go into the pockets of workers and then become savings for homeowners and for building owners. That is the opportunity that we have here.

Mr. PALMER. I have to leave, but this committee had me when they asked me to be here and my other colleagues, but thank you very much. The U.S. Conference of Mayors, we look forward to working with you.

Mr. BLUMENAUER. I look forward to following up with you on these specifics.

As you are walking out the door, one little thing, Mr. Chairman, before—I appreciate your indulgence, but it doesn't like a lot of people waiting to elbow ahead of me. But I want a cautionary note just in terms of the training because some of the people we want to engage in this, again based on prior life as a local official and dealing back when we used to have training programs, CETA, JPTA, back—these acronyms, nobody in this room is old enough to remember this stuff.

Mr. KREUTZER. Some of us are, sir.

Mr. BLUMENAUER. But dealing with the population that we want to engage, I am sorry, 2 weeks isn't enough, and I am with you 200 percent in terms of training and engagement and using the community, working with the community colleges, working with utilities, working with the people in the affected neighborhoods, but we can't set this up to fail. And we need to invest in particularly some of these young people are people who have been out of the workforce for some time; there is more than just learning how to slap down the solar panel. That is the least of it in terms of job readiness. So, please, make your case. I think it is right that it can be done much easier than people think, but we shouldn't minimize the need to invest in the human infrastructure if we are going to be successful in the energy infrastructure and the new challenges.

Mr. NUTTER. If the chairman would allow, on the Congressman's point, one of the issues that I have been raising about the overall stimulus package has been the issue with regard, the word of the decade may be "infrastructure." And I will just have to say this at least as Mayor of Philadelphia and some of the things that have happened in our city and many other cities across America, whether it is on the energy efficiency side, and, Congressman, I absolutely agree with you. I was trying to be responsive to Congressman Cleaver about one particular program. For some things, 2 weeks may be enough. For some programs, 2 weeks is no where near enough, and there is everything in between.

But when we talk about infrastructure, whether it is bridges, roads, tunnels, underground communications, storm water, management systems, schools, and the like, specifically in the construction industry but a number of others, I would only ask for consideration that, in cities like Philadelphia, there are many people who have been left out and locked out of opportunities to participate, especially in the construction industry and a number of others. And I don't know ultimately how you will do this, but for many of these job creation programs, they are certainly, I would ask that there might be consideration of requirements for diversity in the workforce, job training components, the opening up of apprenticeship programs and others. If everyone is supposed to participate in this economic revitalization, if we are really talking about putting Americans back to work, then we just can't put the same Americans who have always had the opportunity back to work and leave others sitting on the sidewalk. And I would ask for that consideration as well.

Mr. BLUMENAUER. Mr. Chairman, I appreciate your courtesy. I hope at some point—we spent a little time, in Portland, Oregon, we were the first city in the country with a comprehensive energy policy in 1979. We have got a few of these, we have had great experience working with this in the past. The Chairman indicates that some day we may even visit Portland to talk about some of the transportation, land use, and energy connections, but I really appreciate the way that you have captured it and the way the panel has presented an opportunity.

And this is this has been very helpful for me Mr. Chairman.

The CHAIRMAN. I thank the gentleman.

And to you, Mayor Nutter, I couldn't agree with you more. I was in a meeting last week with some African American Congressmen, and one of them, who was a little older, said his mother and father, said they were not happy in the South during the New Deal because the Governors of those States who were Democrats insisted that in most New Deal programs, there was actually a prohibition on African American participation in them. And it was only when Harry Truman's Fair Deal came along in 1949 that there was a fuller inclusion.

And I agree with you. We have to make sure that we do this in a way that reflects a fair deal for the 21st century in this green jobs area. And we thank you so much for being here, and we are honored to have had you here.

Mr. NUTTER. Thank you, sir.

The CHAIRMAN. Mr. Van, now we can have you swing back over to the other side of the panel, and I would like, Ms. Bode, if you could, to just elaborate a little more on this green job revolution as it is manifesting itself in the wind sector and tell us about, maybe you could do this Mr. Jones as well, the president of the American Steel Workers told me that it takes 28 tons of steel for every wind turbine that is built in America. That is a lot of steel workers—thank you, mayor. It was an honor to have you here.

Can you talk a little about that and the jobs implications for our country, not just in the way people might think of it as some kind of a white collar, you know, Boston-San Francisco kind of oriented

wind industry? Who gets employed, and can you take us through that from beginning to end?

Ms. BODE. Absolutely, absolutely. In fact, it is interesting that you ask today because tomorrow the President-elect will be visiting one of those facilities in Akron, Ohio, like many other facilities that has expanded from doing auto parts and other kinds of parts and equipment to adding jobs in the area of building supply chain equipment for wind turbines. He is going to be going to Cardinal Fasteners, which provides those huge long bolts that helps put those turbines and facilities in place and into the ground. So it is a very exciting opportunity, I think, for America.

Our association had a workshop in December where they thought they might have 200 or 300 companies come to learn about opportunities to convert, to grow, to add new jobs in the wind area. Over 850 companies showed up in Cleveland, Ohio, to try to see how they might grow and add these jobs in their area. When you talk about 80,000 or 90,000 jobs, it is just a down payment. It is like where you are just at the beginning of this new, clean jobs revolution. I mean, we are talking about half a million jobs just as a kind of a starting point when you start putting these in place. And as I said, the megawatts are growing exponentially, and it is not just the generation, the jobs around generation. It is about manufacturing facilities. Much of these parts were really not made in the U.S. initially, and now all of these new facilities are coming to the U.S. When you talk about the growth in energy jobs, this is where the growth in energy jobs, clean energy jobs in over 21 States, 65 new manufacturing facilities have opened up.

The CHAIRMAN. So a lot of people are talking about a nuclear renaissance. Right now, the nuclear industry produces 100,000 megawatts of electricity every day. Now you are saying that the wind industry added 7,000 new megawatts of electricity this year.

Ms. BODE. Second only to natural gas, which is the top.

The CHAIRMAN. And 4 or 5 years from now, if we get the policies right, how many new megawatts per year do you think we could produce in the United States, new megawatts?

Ms. BODE. We are talking about 20 percent of the Nation's electricity.

The CHAIRMAN. Do you think that could be 12 new megawatts a year?

Ms. BODE. 13 gigs.

The CHAIRMAN. What do you think is possible?

Ms. BODE. Well, last year, we don't have the final figures from last year, but we know it approached or exceeded 7,500 megawatts. It will be growing like that. If we get the stimulus package right, we hope to at least match that or get close to that if the uncertainty is not——

The CHAIRMAN. Five years from now——

Ms. BODE. Five years from now. We are going to be able—in 3 years, we are going to meet the President's target of doubling the amount of generation that we have. Over the last 3 years, we doubled it. We believe truly——

The CHAIRMAN. What I am trying to do is give people who are listening an idea, though, of the scale of what we are talking about.

Ms. BODE. We are talking about 16 gigawatts.

The CHAIRMAN. Again, I am trying to keep it in one metric, and that metric is the nuclear industry produces 100,000 megawatts a year. That is 20 percent of all electricity in America. They haven't built a new power plant successfully from ordering to completion since 1974. So there won't be any new nuclear power plants to come online in the United States, even if they began today, for about 10 years. In 10 years, how many megawatts, for example, do you think that we could meet? So, today, there are 20——

Ms. BODE. 24,000.

The CHAIRMAN. 24,000. You are saying that you will meet, if this stimulus package is put together, you will meet the President's goal of doubling that in 3 years. Is that correct?

Ms. BODE. That is right.

The CHAIRMAN. Well that takes you to 48,000 megawatts. Again, the nuclear industry after 50 years produces 100,000 megawatts a year. So if you extrapolate that out and you go out 10 years altogether, you might be looking at 100,000 to 125,000 megawatts of wind in the United States before the first new nuclear power plant produces 1,000 new megawatts of wind. Is that correct?

Ms. BODE. Good point, yes.

The CHAIRMAN. Does that math work for you, or is that too ambitious for your industry?

Ms. BODE. I don't think that is too ambitious at all.

The CHAIRMAN. Well, that is exciting because that is a guarantee of what is going to happen because there hasn't been any new nuclear power plants for so long, and we know this is something that is creating new jobs. And what is the upside? How many jobs per year do you think you can actually create in the wind industry if you were producing 15,000 or 20,000 megawatts a year?

Ms. BODE. I think what we are talking about right now is, you know, in the next, with this and with the renewable electricity standard, which we hope to have into place in the next 3 years, and perhaps close to 200-plus thousand jobs.

The CHAIRMAN. By the way, this is not to say there isn't going to be any new nuclear power plant generation in America. It is just to contrast it, so that there can be an understanding of what is happening already in the wind sector, and this doesn't include solar or geothermal or tidal or a whole range of other renewable energy sources that will be creating new jobs over the next year as well.

Mr. Jones, how would you respond to that?

Mr. JONES. Well, first of all, that is an exciting number when you are talking about 200,000 jobs creating something that is going to deal with the greenhouse gas crisis. One of the things I think is very important is that we look at Detroit; we look at our so-called Rust Belt. Why don't we put Detroit back to work, not making SUVs that are going to help destroy the world but in making these wind turbines? The thing about wind turbines is they are so heavy that it actually doesn't make sense to make them on the other side of the world and bring them over here. When you are talking about 28 tons of steel, you are talking about putting steel workers to work in this country, and you can put our automakers back to work. A wind turbine has 8,000 finely machined parts in it, 8,000. That is a car. You want to bail out Detroit, that is great, but let's bail out the people on the planet, too. I would like to see a $15 bil-

lion purchase order from the U.S. Government going to General Motors. They are called General Motors, not General Cars, not General SUVs. The motors we need right now are wind turbines to get us the jobs of the future.

The CHAIRMAN. They actually make automobiles in Akron, Ohio. Or they did. It is in jeopardy. But the president is coming with some good news for them——

Ms. BODE. Absolutely.

The CHAIRMAN. Tomorrow that those same workers can be employed making some other technology, as Van Jones just said, that also requires a skill set that can help to assemble the new energy devices for the next century.

Let me turn again and recognize the gentleman from Portland.

Mr. BLUMENAUER. I wanted, Ms. Bode, to just make a request. I am wearing another hat here. You mentioned some of the vagaries with finance because, at this point, we need some Federal assistance with production tax credit, something that is part of how we have helped incent the industry and there have been all sorts of Federal involvement and all sorts of energy sources in times past, and we have made a judgment that I think is appropriate that we need to help get this off the ground to get to critical mass. And we still need to have some financial incentive; a, financial incentive, and, b, it needs to be predictable and efficient.

I wonder if you could help us with the benefit of your team of members and staff to evaluate the efficiency of the production tax credit. How much of what we give away of Federal tax benefit actually is used by the developer to create the project? How much leakage is there because of the vagaries? Some of it is unpredictable. Now there are not quite as many people who can use the tax credit, and there is a discount; there is always some sort of discount and deal-making. Are you in a position to help us evaluate just how much of each dollar ends up in the production of wind energy?

Ms. BODE. Well, it is interesting because, you know, the production tax credit is so interesting because it is based on the production of electricity. It is not like the investment tax credit, where you can build something and then get the credit without the next step. So, actually, that is why it was put in place, which I think is, again, a very important tax policy consideration. But the lion's share of the money from the production tax credit in normal years is monetized for the use, to go into building and using for those facilities. But in the startup years, most of these companies do not—I mean, they are investing all their money into building this stuff, so they don't have the extra revenue to utilize the tax breaks on it. So, in terms of the exact percentage, I can get that for you. But that is part of the problem now. That is why we are talking about asking for the refundability and the transfer ability of the issue, because that way, that way, you are actually able to utilize all of it for them without having to deal with going through the financing.

Mr. BLUMENAUER. We have a package that, at least the last meeting I was at, seemed to have elements here that address those problems.

So we hopefully will give you a clear window to operate going forward here for the, hopefully, the next couple of years so that we

can kind of sort this out. While we do that, I would appreciate your helping us evaluate its effectiveness; how they are able to take advantage of it; what the efficiency is in terms of the Federal outlay versus how much is actually utilized; how much leakage there is. And in part, any calibration or estimate about loss because of uncertainty, the start, stop, these would help us because we are going to have an energy bill, I anticipate, coming forward in the next few months as the administration kind of settles in, and we will be, because of the artful way that Karl Rove and Tom DeLay and Bill Thomas structured all the tax cuts to kind of expire, we are going to be revisiting the Tax Code in a, hopefully, pretty comprehensive way so we may be able to work with you to make sure that benefit, however much it should be, actually gets to you in the most efficient way.

Ms. BODE. I very much appreciate that, and I wanted to say thank you to you as well because your work in terms of renewables, both wind and solar, on the Ways and Means Committee has been absolutely incredible. And I wanted to say thank you for the work on that.

Also I wanted to mention as an old tax hand, I started off working on the Senate Finance Committee staff back in 1979, so I have kind of been through the whole wars on the renewable, what was renewable tax credit and not a production tax credit. And I was a State regulator for 10 years, and so we actually had to start wind projects in my home State of Oklahoma by putting an encouragement in rate cases. So what you do when you do not have a long-term or a permanent extension of these tax credits, whether you decide at some point to eliminate them or not, is you create this rush to build a project and then, without the certainty, then you have this drop off and, so you don't have the long-term interest. You don't build up the market of investors available to go in and to raise the capital to have this be a growing industry. And that is what has happened. We can chart it, every single time a tax credit. And that is why this is an important—short term, addressing the short-term problem in terms of the production tax credit. What we really need long term and mid term is to really get in there and address a renewable electricity standard that addresses the issues you were talking about, utilities, addresses the issues, giving people certainty, a signal from the Federal Government that this is the right answer.

Mr. BLUMENAUER. And I am confident that that should and will be a part of the next wave in terms of having a real renewable portfolio standard in the legislation.

Mr. Houser, do you have——

Mr. HOUSER. I can maybe provide some color on that. We analyzed this in our study, and Ms. Bode has more on-the-ground experience with the wind industry. But from a modeling standpoint, the Department of Energy currently predicts that, between now and 2014, an additional 5.9 gigawatts of wind will be built. In our scenario, using that model, and we extend the production tax credit to 2014, the additional wind capacity build is 16 gigawatts. So you are paying for the 5.9 gigawatts that would have happened anyway but there are 16 gigawatts in addition created, so—which isn't bad

in terms of leakage, as you say. It is about 70 percent of the marginal increase that you get as the result of your tax credit.

The more important question I think is what this body and the Senate are planning in terms of climate policy, because if our goal is to reduce CO_2 emissions, then, as an economist, that is where we want to put the price is on CO_2 emissions and not support specific technologies. If you put in place something like Lieberman-Warner that took effect in 2013 in addition to the production tax credit, the amount of new wind created in our model goes up to 44 gigawatts, but the share of that that the PTC is responsible is significantly less, and so you are double paying for the wind that you get both through the production tax credit and through climate policy. So I think, in thinking about the timeframe for incentives created under a stimulus package, it is important to keep climate policy in mind because, again, all the things that we are talking about here are only going to make the very smallest of a beginning in reducing CO_2 emissions.

The CHAIRMAN. Thank you. Thank you all. I feel a little awkward because I think I must adjourn the hearing, and I have to apologize. I have got 9 minutes to sprint across the Capitol, so I apologize. But I do deeply appreciate your being here.

I have a letter that I want to enter into the record that Mr. Inslee wanted to be a part of. And we will look forward to following up with you individually because you have really sparked our interest and attention and look forward to continuing this work with the committee and maybe in some of our other committees on Budget and Ways and Means. I am sure we will be crossing paths.

Ms. BODE. Well, you have given us a good to-do list, so I will follow up.

Mr. JONES. Thank you so much. Also our colleague from Heritage raised some very, very important questions, especially comparing what is happening in Europe to what could happen here. And I think his point about doing what we can to lowering the cost of clean energy is something that we should follow up on very aggressively.

Mr. BLUMENAUER. Thank you. Thank you all.

Ms. BODE. Thank you very much.

[Whereupon, at 4:10 p.m., the committee was adjourned.]

Responses to Follow-up Questions for the Select Committee on Energy Independence and Global Warming

David W. Kreutzer, Ph.D.
Senior Policy Analyst
The Heritage Foundation

1. **What is the single most productive action that Congress can do to stimulate the economy?**

   Though the single policy likely to have the strongest immediate impact would be tax relief for the most productive sectors of the economy, the policy that pays off at the greatest rate would be unblocking access to America's energy. Opening up the Outer Continental Shelf and other federal properties to exploration and production will cost the government zero, generate royalty revenues, and reduce our dependence on more costly imported energy.

2. **Do you support including additional spending for the nuclear industry as part of a carbon-free portfolio included in second stimulus plan?**

   All energy sources should compete without subsidies. Production that only occurs with subsidies is production that reduces economic growth—it creates output whose value is less than the value of the inputs. On the other hand, regulations that allow legal challenges whose only purpose is to impede nuclear development should be eliminated. The same would hold for regulations that are used only to impede the development of any energy source.

3. **Many studies show that imposing limits on carbon emissions will slow U.S. economic and job growth. How can imposing a cap and tax system to reduce GHG emissions which would tend to cause households and businesses to substitute more expensive renewable energy for lower cost fossil fuels have a positive impact on the economy?**

   Cap and tax won't have a positive impact on the economy. Imposing taxes on the most cost-efficient forms of energy will necessarily reduce economic productivity. Analysis done at The Heritage Foundation's Center for Data Analysis found the cuts in carbon dioxide prescribed by the Lieberman-Warner bill of 2008 would have reduced Gross Domestic Product by nearly $5 trillion dollars in just the first 20 years. At that point the

carbon dioxide reductions are only half way to the ultimate 70 percent reduction target.

4. **How would a cap and trade scheme impact the U.S. economy? What would such a program do to employment levels and national income? Can you briefly explain the Heritage Foundation's study of the Lieberman-Warner bill?**

Because the United States generates 85 percent of its energy with carbon-based fuels and because sufficient quantities of affordable alternatives will not be available in the near future, large cuts in carbon dioxide lead to large cuts in energy use. Since energy is a critical input for a modern economy, cap and trade will throttle economic activity, reduce incomes and eliminate jobs.

The Heritage Foundation analysis of the Lieberman-Warner bill projected the bill would cost the economy nearly $5 trillion in lost GDP (even after adjusting for inflation) and reduce manufacturing employment by nearly 3,000,000 jobs. Though some of those released from manufacturing employment will find jobs in other sectors, the net employment reduction exceeds 800,000 jobs in some years. All of these impacts are in just the first 20 years of the program.

5. **How would you describe a green job? Would you consider your job a "green job?" Does your work on energy economics change the net employment rate?**

It seems even those promoting "green" jobs have a difficult time defining them. Reducing some environmental impact relative to some status quo might be part of a definition. Whatever the definition might be, the job losses found with our econometric analysis includes any offsetting "green" job creation. That is, even after any "green" jobs are created, manufacturing will lose an addition 3 million jobs by 2029.

The equations in our macroeconomic model have been estimated using decades of real-world data. As energy prices rose and fell over those years, consumer and producer responses get built into the equations. We know that higher energy prices cause consumers to use less energy and seek out more efficient cars, appliances, housing, etc. In addition manufacturers seek out more energy efficient capital and production processes when confronting higher energy costs. So, those firms providing products and services that help consumers and other firms cope with higher energy prices can see employment increases. Though the model may not identify particular firms that gain employment, the net employment impact on the economy and on different sectors is

calculated. The great variation in energy prices over the past several decades allows us to estimate how the different parts of the economy will respond to future changes in energy costs.

In an attempt to support his argument for "green" job creation, another economist publicly claimed that I have a green job since much of what I do deals with climate policies. That may well be true, but it doesn't support his argument that green jobs stimulate the economy. Here is why: I had a job before my current one. I drive the same car. I live in the same house. I pay the same amount for groceries, utilities and virtually everything else. The money paid to me as a climate-change analyst cannot be simultaneously paid to somebody else. Nor can I do the job I had before simultaneously with my current one. In short, there has been no increase in employment, and no induced or indirect employment increases as a result of my "green" job. Ignoring this cost of "green" job "creation" is a consistent and serious fault with studies claiming a "green" stimulus from either higher energy prices or directed "green" spending.

6. **Do your job projections account for "green job" growth?**

Yes. The job losses we calculate are after any "green job" creation. A fuller answer is provided in Question 5 and copied here:

The equations in our macroeconomic model have been estimated using decades of real-world data. As energy prices rose and fell over those years, consumer and producer responses get built into the equations. We know that higher energy prices cause consumers to use less energy and seek out more efficient cars, appliances, housing, etc. In addition manufacturers seek out more energy efficient capital and production processes when confronting higher energy costs. So, those firms providing products and services that help consumers and other firms cope with higher energy prices can see employment increases. Though the model may not identify particular firms that gain employment, the net employment impact on the economy and on different sectors is calculated. The great variation in energy prices over the past several decades allows us to estimate how the different parts of the economy will respond to future changes in energy costs.

7. **How is the European Union's Cap and Trade Scheme working to reduce greenhouse gases? Are they on track to meet their target set by the Kyoto Protocol?**

Here is a quote from a November 2008 press release of the United Nations Framework

Convention on Climate Change Secretariat:
"Data submitted to the United Nations Framework Convention on Climate Change (UNFCCC) shows that emissions of 40 industrialized countries that have greenhouse gas reporting obligations under the Convention remained in 2006 below the 1990 level by about 5%, but rose by 2.3 percent in the time-frame 2000 to 2006.

"For the smaller group of those industrialized countries that have ratified the Kyoto Protocol, emissions in 2006 were about 17% below the Kyoto baseline, but still growing after the year 2000. The initial decrease in Kyoto countries' emissions mainly came about through the economic decline of economies in transition (countries in eastern and central Europe) in the 1990s."
[http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/081117_ghg_press_release.pdf]

It seems that though Kyoto signatories are below the Kyoto baseline, the cuts are primarily due to economic decline that Soviet-influenced countries suffered in the early 1990s. The overall emissions have been increasing since the year 2000.

8. **If households and businesses want to substitute renewable energy for conventional fuels, can't they make that choice without additional government subsidies? How would increased energy costs affect household consumer spending?**

Of course people already have choices for renewable energy. Indeed, in some situations renewable energy (even without a subsidy) is more cost effective. For example, photovoltaic solar panels have provided electric power in satellites for over thirty years. Subsidies are needed only when the alternatives are more costly.

As energy costs rise, consumers make predictable adjustments. Over time, they will switch to smaller cars and smaller houses. They will pay extra for appliances and other products that use less energy. They will travel less and turn thermostats down in winter and up in summer. But even after these adjustments, consumers will pay higher prices for electricity, gas, heating oil and gasoline and they will spend more, in total, on energy. Of course, this means households will have less to spend on other things.

In addition to paying higher energy costs directly, consumers will pay higher prices for virtually all products and services as the embedded energy costs for these other goods

are reflected in their prices.

9. **What would the impact of a cap and trade system like the Lieberman Warner bill impact per capita GHG emissions in the U.S?**

Current emissions per capita in the U.S. are about 20 tons per year. The Lieberman-Warner target for 2050 was a 70 percent reduction in total emissions. Since the population of the U.S. is projected to increase by 42 percent by 2050, per capita emissions would have to drop to about 4.2 tons per year. A 70 percent drop in total emissions by 2050 translates to more than a 78 percent drop in per capita emissions. If population increases beyond 2050, per capita emissions would have to decline in proportion even though total emissions would be constant.

10. **If the U.S. were to reduce GHG emissions to 60 to 80 percent below current levels by 2050 but major developing countries do not slow their strong emission growth, what would the impact on GHG concentrations in the atmosphere be?**

The Intergovernmental Panel on Climate Change estimates that world temperatures rise between 2 and 4.5 degrees C for every doubling of CO2 concentration. In its analysis of the Lieberman-Warner bill, the Environmental Protection Agency estimated that world carbon dioxide concentration would drop from 719 ppm to 694 ppm in 2095. This is .05 of a doubling. Therefore, Lieberman-Warner by itself would reduce average world temperature in 2095 by 0.1 to 0.23 degrees C.

11. **What is your analysis of the net economic effect if a cap-and-trade is created to raise revenue for directed renewable spending? Would the net result negatively impact the American economy?**

Our analysis of the Lieberman-Warner cap-and-trade legislation projected lost national income (GDP) would be nearly $5 trillion in just the first 20 years, even after adjusting for inflation. Our assumption in this analysis is that the economy is allowed to adapt as efficiently as possible given the constraints of the Lieberman-Warner and other existing legislation. Optimal adjustment means an additional dollar of renewable spending is only done if there are no other ways of achieving carbon reductions with less cost. Forced spending on renewable fuels or technology can violate this rule of optimality. For instance, if spending $10,000 on a more efficient car reduces CO2 emissions the same amount as using $12,000 of renewable fuels in a less efficient car, consumers would opt

for the more efficient car and the non-renewable fuel. Mandated spending on renewable fuels would force the second and more costly choice.

So, directing cap-and-trade revenues to renewable spending would actually increase the cost of cap-and-trade compared to rebating the revenue via either tax cuts or deficit reductions.

Structuring a Green Recovery: Evaluating Policy Options for an Economic Stimulus Package

Trevor Houser
Visiting Fellow, Peterson Institute for International Economics
Director, Energy & Climate Practice, Rhodium Group LLC

Response to additional questions from members of the Select Committee on Energy Independence and Global Warming
US House of Representatives

April 7, 2009

Dear Members of the House Select Committee on Energy Independence and Global Warming,

Thank you for the opportunity to testify before you on January 15th on energy and environmental options for an economic stimulus package. Below are my answers to your follow-up questions. The views expressed here are my own and do not reflect the opinions of either the Peterson Institute for International Economics or the World Resources Institute.

1. ***What is the single most productive action that Congress can do to stimulate the economy?***

As an energy economist, rather than a macroeconomist, I limit my response here to what the most productive form of "green" fiscal stimulus rather than the most effective form of stimulus overall. Of the energy-related policy options we evaluated, direct government investments in residential weatherization or federal building retrofits provided the most stimulus value. The economic outcome of government investments in building efficiency are more certain than tax credits for renewable energy or vehicle trade-in programs given the current economic climate. In addition, the energy savings that result from such efficiency improvements help offset the long-term fiscal impact of current spending.

2. ***Do you support including additional spending for the nuclear industry as part of a carbon-free portfolio included in second stimulus plan?***

As with the other energy-related stimulus activities we evaluated, the key question is how quickly funds for nuclear power expansion would be put to work in the economy. For nuclear power in particular, planning and regulatory hurdles may be more significant barriers than the availability of government funding.

3. ***Many studies show that imposing limits on carbon emissions will slow U.S. economic and job growth. How can imposing a cap and tax system to reduce GHG emissions which would tend to cause households and businesses to substitute more expensive renewable energy for lower cost fossil fuels have a positive impact on the economy?***

From an employment standpoint, the net impact of price-based climate policy depends on the resulting increase in electricity prices and on the relative labor-intensity of low-carbon energy sources

vs. high-carbon energy sources. Our analysis shows that a switch from fossil fuel to renewables and efficiency is a net job-creator if there is no resulting change in energy prices. We have not modeled the impact of prospective domestic climate legislation on energy prices. It's clear from the existing studies it is clear that this will depend largely on the types of cost containment mechanisms included.

4. ***What rate for electricity did you use to reach your conclusion on the amount of annual savings for building efficiency? How would changing rates alter your models? Did your models incorporate the possibility of a cap and tax scheme and the resulting increased cost of energy?***

All energy prices in our analysis come from the US Energy Information Administration's National Energy Modeling System (NEMS). We took EIA's Annual Energy Outlook 2009 and imposed our policy scenarios. The resulting changes in energy costs, both to individual firms and the economy as a whole, are then generated dynamically by NEMS. We did not include price-based climate policy in our core scenario. We did, however, examine the impact of some fiscal stimulus proposals under the EIA's 2008 assessment of the Lieberman-Warner bill.

5. ***If these investments would result with a net savings, why does Congress need to spend tax dollars on such projects?***

Improving the efficiency of federal buildings won't occur unless government funds are committed. For private residences, households are often deterred by large up-front costs of investing in energy efficiency, even if the return is quite good. Our study does not, however, argue that government spending on renewables and efficiency is the most economically effective way to meet environmental goals (though it may be in some cases). Rather, that among the fiscal stimulus options, investments that improve energy efficiency offer useful co-benefits both in terms of emission reductions and long-term cost savings to households government itself.

6. ***How much R&D funding does the Department of Energy currently conduct? Why should additional money be incorporated in a stimulus bill, rather than through the regular appropriations process? Does your study consider energy research funded from other departments, such as the Department of Defense which is conducting extensive hybrid and battery research?***

Our study does not argue that specific options should or should not be included in a stimulus bill, but provide a framework for assessing the relative merits of individual options in terms of economic stimulus and emission reductions. From a stimulus standpoint, the key consideration facing any potential increase in R&D funding is how quickly it will be put to work. We only evaluated one such scenario, investment in battery R&D, which would likely occur through the Department of Energy. We did not evaluate any prospective Department of Defense programs.

7. ***A smart grid will be a necessary development to replace our existing aging and stressed transmission grid. What aspect of developing a smart grid necessitates emergency spending from the stimulus?***

In my view, the important question is not whether grid investments are urgent enough that they must be included in a stimulus package, but rather would grid investment make for useful stimulus.

Certain "smart grid" spending fits this bill, particularly installation of Advanced Metering Infrastructure as part of residential or government building retrofits funded by the stimulus package.

8. ***In previous committee hearings, some witnesses have explicitly stated that road infrastructure development is not "green" policy. Why do you include transportation projects in with other "green" policies? Wouldn't infrastructure projects help to reduce congestion and thus, reduce emissions?***

We do not include road investment as a "green" policy, but as an example of the energy and environmental impact of non-"green" portions of a stimulus package. We find that investment in roads does increase CO2 emissions and oil imports, but that dollar-for-dollar this effect is fairly modest compared to the savings achieved through the "green" programs assessed.

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January 14, 2009

The Honorable Edward Markey
The House Select Committee on Energy Independence and Global Warming
B243 Longworth House Office Building
Washington, DC 20515

Dear Chairman Markey:

On behalf of the U.S. Green Building Council (USGBC)--a non-profit organization with more than 18,000 member organizations, 78 chapters and affiliates, and a vision of a sustainable built environment within a generation--I would like to thank you for your leadership in convening this hearing to focus on green programs in the upcoming economic recovery package.

USGBC supports smart, innovative policies to assist Congress in crafting a bold plan for economic recovery and renewed growth, and therefore urges the inclusion of the following programs that integrate environmental and economic results:

- ***Provide Robust Support for Green Schools.*** Twenty percent of America goes to school every day, yet across the country, thousands of school buildings suffer the effects of age, lack resources for renovation, and offer unhealthy and unsafe learning and working environments. In addition to a host of other benefits, greening our schools could save enough money in operating costs and utility bills, on average, to hire two new teachers for every school.[1] USGBC recommends that the federal government provide robust funding for school construction and renovation projects that comply with energy efficiency and green building standards, such as LEED for Schools.

- ***Create a Revolving Loan Fund to Spur Investment in Green Building.*** USGBC recommends the creation of a multibillion-dollar revolving loan fund, accessible to state and local governments, to support retrofitting and green building projects that create energy savings and a positive return on investment. Utilizing a revolving loan fund mechanism whereby loans are repaid through energy and other savings from funded improvements could dramatically reduce future federal budget liability for green initiatives.

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[1] *See* Gregory Kats, Capital E, *Greening America's Schools: Costs and Benefits* (2006), *available at* http://www.usgbc.org/ShowFile.aspx?DocumentID=2908.

- ***Provide Robust Support for Green Job Training.*** USGBC recommends full funding of the green job training programs outlined in the Green Jobs Act of the 2007 federal energy law to ensure the preparation of America's workers toward a new, more competitive green economy. Additional incentives are necessary to encourage private employers to seek training for their existing workforces. As an important first step, USGBC recommends the creation of a new tax incentive for businesses and organizations that pay for their employees to participate in training programs administered consistent with the framework of the Green Jobs Act.

- ***Fund Green Building Projects in Government Facilities and Measure the Results.*** Throughout the country, backlogs of public facility projects highlight the need for significant investment to ensure the safety and sustainability of our nation's public buildings. These projects represent an important opportunity to spur local markets, demonstrate leadership by example, and create good, green jobs while reducing energy and operating costs. The U.S. General Services Administration (GSA) recently issued a post-occupancy study of 12 green buildings in its portfolio, finding that these buildings use 26% less energy, have 13% lower maintenance costs, and have 33% fewer carbon emissions, as compared to the national averages.[2] USGBC recommends that the federal government provide significant funding to support green building, retrofitting, and energy efficiency projects in federal facilities, in recognition of the tens of billions of dollars in estimated repair and improvement needs reported by federal agencies. Significant investment in green building and renovation projects in state and local public facilities is similarly essential. Full funding of the Energy Efficiency and Conservation Block Grant program created by the 2007 federal energy law is a critical step to this end.

- ***Invest Boldly in Green Affordable Housing.*** The deteriorating state of many public housing facilities compounds the difficulties posed by a troubled economy. Indeed, the Center for Budget and Policy Priorities recently reported that state and local housing agencies owning and operating public housing face an estimated repair and maintenance backlog of $22 billion. Energy inefficient and poorly maintained buildings pass on additional costs to low-income residents, who must dedicate a significant share of their already limited incomes to utility bills, and who may experience negative health effects, including asthma, as a result of poor ventilation, or the presence of mold or toxic materials. Green

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[2] *See* General Services Administration, *Assessing Green Building Performance: A Post-Occupancy Evaluation of 12 GSA Buildings* (June 2008; revised Sept. 2008), *available at* http://www.usgbc.org/ShowFile.aspx?DocumentID=4308.

building presents an opportunity to improve the environmental performance and reduce the operating costs of public housing. According to the Environmental Protection Agency (EPA) and the Department of Energy (DOE), Energy Star Qualified Homes use approximately 30% less energy than standard homes and can save homeowners approximately $200 to $400 per year.[3] USGBC recommends that ample funding be provided for green building and retrofitting projects in public housing facilities to tap the potential of these opportunities. The federal Weatherization Assistance Program offers additional, proven opportunities to create green jobs, reduce energy consumption, and increase the affordability and comfort of America's homes. USGBC recommends that the federal government provide robust funding for this critical initiative.

USGBC commends you for your leadership in promoting green economic recovery, and we look forward to working with the Select Committee to promote the uptake of policies and initiatives that advance green building, energy conservation, and healthy, livable communities.

Sincerelv.

Jason Hartke
Director of Advocacy and Public Policy

[3] *See* U.S. Government Accountability Office, *Green Affordable Housing HUD Has Made Progress in Promoting Green Building, but Expanding Efforts Could Help Reduce Energy Costs and Benefit Tenants* (October 2008), *available at* http://www.gao.gov/new.items/d0946.pdf.

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