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STATE, REGIONAL AND LOCAL PERSPECTIVES ON GLOBAL WARMING

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

MARCH 1, 2007

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ONE HUNDRED TENTH CONGRESS
FIRST SESSION

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STATE, REGIONAL AND LOCAL PERSPECTIVES ON GLOBAL WARMING

THURSDAY, MARCH 1, 2007

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 10 a.m. in room 406, Dirksen Senate Office Building, Hon. Barbara A. Boxer (chairman of the committee) presiding.

Present: Senators Boxer, Inhofe, Voinovich, Lautenberg, Clinton, Cardin, Sanders, Klobuchar, Whitehouse, Craig, Thomas and Bond.

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Good morning. The committee will come to order.

Today's hearing is about State, regional and local approaches to global warming. We have wonderful witnesses today who can really, I think, help us as we grapple with these issues. I do want to welcome all of our witnesses, including the good Governor, former Senator Jon Corzine, a former member of this committee.

I also particularly want to welcome the two members of the California State legislature. I never know in which order to introduce you, because to me you are partners and you are equals. I am very proud that Don Perata is here, President pro tem of the California State Senate and Speaker of the Assembly, Mr. Fabian Nuñez.

I also want to welcome Mayor Nickels, from Seattle, and the Mayor of Des Moines, IA, Frank Cownie. In addition, I want to welcome State Representative Dennis Adkins of Oklahoma. Welcome, sir. State Senator Ted Harvey of Colorado, welcome, sir. And Mayor Richard Homrighausen of Dover, OH. Are you here? He is on the way.

Let me say that we will have a more formal introduction of Governor Corzine by Senator Lautenberg and hopefully by Senator Menendez if he arrives on time.

Every day we learn more about how global warming is threatening the well-being of the plant. Just a few weeks ago, the Inter-Governmental Panel on Climate Change released its report, which makes it clear that global warming is happening now and there is a 90 percent certainty humans are causing most of the warming. Just yesterday, I was at a press conference with Senator Bingaman and former Senator Tim Worth to discuss this latest report Confronting Climate Change: Avoiding the Unmanageable and Managing the Unavoidable. It is another United Nations report by the

United Nations Foundation, the Scientific Research Society. So yet more and more studies are coming in on this.

The warming could have enormous consequences for mankind. Left unchecked, global warming will lead to increased extreme weather events, to sea level rises, to more floods and hurricanes and to change in our weather patterns that could reduce our water supplies. These are but a few of the effects that global warming will have on our States and cities in the years to come unless we act.

Today's hearing is about those States, regions and cities that already recognize these facts and have taken strong, bipartisan action to help stop global warming. In my opinion, they are leading the way for the rest of the Nation. They understand what is at stake for our future and for our grandkids and their kids. They are sending us a signal that we must heed.

I want to show you a map. It shows you that 29 States already have some form of climate action plan. Senator Inhofe, I wanted to call this to your attention to show you that 29 States already have some form of a climate action plan. These 29 States have a combined population of nearly 180 million people. Fourteen of the twenty-nine States shown in yellow have set greenhouse gas reduction targets. Eight northeastern States, including New Jersey, have agreed to reduce emissions from powerplants through the regional greenhouse gas initiatives. More States, such as Maryland, are expected to join in this effort.

On Monday, California, Arizona, Oregon, Washington and New Mexico announced a regional initiative to address global warming. It is only a matter of time before more States follow. I am especially proud of my State, California, which enacted A.B. 32, the Nation's first economy-wide global warming bill, authored by State Assembly Speaker Nuñez, who is here today. Under the leadership of State Senate President pro tem Perata, California has also set strong emission standards for new electricity generation.

Now, I met yesterday with Governor Schwarzenegger. We had a terrific meeting. He again continued to speak out for us to pay attention to this issue. I am going to ask unanimous consent to place the letter that he wrote to me for today's hearing into the record. So without objection, it will be done.

[The referenced material follows:]

February 28, 2007

The Honorable Barbara Boxer
Chair
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

Dear Senator Boxer,

Thank you for allowing me to provide this written statement to the Senate Committee on Environment and Public Works for its very important hearing on State and Local Perspectives on Global Warming. I regret that my schedule does not permit me to testify in person.

I applaud your leadership on global climate change, and look forward to working with you, with members of the Committee, and with other members of the United States Senate and House of Representatives to find solutions to this important problem.

Global climate change is one of the most critical environmental *and* political challenges of our time. The debate is over, the science is in, and the time to act is now. Only by putting aside our political differences and bringing all parties and stakeholders together will we truly be able to confront this crisis.

California has a history of finding innovative and effective solutions to important problems. In the area of energy efficiency, while the rest of the United States has experienced a 50 percent increase in per capita energy consumption over the past thirty years, California has kept its per capita consumption flat. Our state has achieved this while experiencing record economic growth. We have done so through government policies that set aggressive targets for efficiency, and then allow the creativity of the market to meet those targets. California is bringing this same leadership and approach to the fight against global climate change.

As you know, last year in California we developed the world's most comprehensive approach to reducing greenhouse gas emissions. By enacting the landmark Global Warming Solutions Act, California put itself on a path to reduce greenhouse gas emissions to 1990 levels by 2020. This law will achieve a 25 percent reduction from today's emissions levels through regulation, best management practices, incentives and market-based compliance mechanisms.

It is essential that we continue to develop market-based approaches to reducing carbon emissions. I urge Congress to develop a national market-based cap and trade program that helps solve this growing threat to our planet and builds a forward-looking economic sector for our nation. This approach harnesses the power of the marketplace by giving financial value to carbon allowances and creating a financial incentive for emissions reductions.

In California, we are continuing to develop comprehensive strategies to address the problem. One recent example is the Low Carbon Fuel Standard, which I enacted by Executive Order earlier this year. The Low Carbon Fuel Standard will reduce California's dependence on oil *and* reduce our greenhouse gas emissions from transportation. I urge Congress to adopt a national Low Carbon Fuel Standard. Reliance on one resource to fuel our economy is unsustainable and is a risk to our nation's energy security. Today, the United States and California are dependent on oil for 97 percent and 96 percent of our respective transportation fuel needs. Moreover, transportation is the top source of greenhouse gases in California and the second largest source in the nation. A national Low Carbon Fuel Standard would help break our unhealthy dependence on foreign oil and dramatically improve our environment.

During British Prime Minister Tony Blair's visit to California for our climate change summit last year, he spoke to me about the importance of individual U.S. states showing leadership to counteract the perception that Americans are not willing to join the climate change fight. Less than a year later, states are taking action on climate change. As one example, I signed an agreement earlier this week with four other western governors that commits our states to developing a regional reduction target for greenhouse gas emissions, and a market for achieving that reduction target.

State efforts like California's Global Warming Solutions Act, its Low Carbon Fuel Standard, and the five-state agreement to address carbon emissions not only make a difference in fighting global climate change, but also demonstrate the strong popular support for action that exists throughout the country. These efforts send a powerful message to the federal government and to the world, and they help our nation both recognize what must be done to confront the climate crisis *and* find the political will to do so. Because state initiatives have, and continue, to play such a critical role in advancing the fight against global climate change, I trust that whatever work Congress does on this issue will recognize and support – and not impede – those important state efforts.

I know that you and members of your Committee have long been on the front lines of the fight against global climate change. Thank you for your continued efforts to highlight the importance of this issue, and to seek real and lasting solutions. I hope that you will never hesitate to call on me as you move forward with this important work.

Sincerely,

Arnold Schwarzenegger

Senator BOXER. I will just read simply one paragraph: "Global climate change is one of the most critical environmental and political challenges of our time. The debate is over, the science is in, and the time to act is now. Only by putting aside our political differences and bringing all parties and stakeholders together will we truly be able to confront this crisis." I thank the Governor for this letter.

Governor Corzine's recent executive order requires New Jersey to reduce its emissions to 1990 levels by 2020 and by 80 percent from current levels by 2050. I commend his leadership.

Our cities have also taken action. Led by Seattle Mayor Nickels, a bipartisan group of 407 mayors, representing over 59 million people, have signed onto the Climate Protection Agreement. Finally, Mayor Cownie will tell us about the actions he is taking in Des Moines to help his city and his actions take action to fight global warming. They are fueling their fleets with ethanol and biodiesel, they are building more bike paths in Des Moines, they are encouraging their citizens to use compact fluorescent light bulbs.

Now, these may seem like very small things. But in the end, they add up. People everywhere are waking up to the reality of global warming. Earlier this week, the investment community announced plans to take over a major Texas utility and to scrap its plans to build 11 new coal-fired powerplants. That decision took heed of the editorial that Senator Bingaman and I wrote, which made clear that permits for such plants to emit greenhouse gases would not be granted for free. The days when investors could ignore the possibility of greenhouse gas limits are coming to a close.

There is increasing bipartisan consensus that we need to move now to limit emissions. The States and cities that we will hear from today are leading the charge. I am an optimist, and like the States and cities who are taking action today, I believe we can solve this problem, and in doing so, we will be better for it in every single way. I look forward to hearing all of the witnesses' testimony on this issue today.

It is my pleasure to call on the Ranking Member, Senator Inhofe.

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

Senator INHOFE. Thank you very much, Madam Chairman. You mentioned a couple of things, some comments in your opening statement. As far as the TXU is concerned, that is a huge success that you guys have had in what I call divide and conquer, to be able to get the natural gas people and the nuclear people to realize how much money they can make by shutting down coal-fired plants. It is something perhaps the board of directors had a lot of pressure in getting them to do.

As far as the IPCC fourth assessment is concerned, the interesting thing about this is, first of all, as we have said before, this is not any kind of a science report, this is a summary for policymakers. It has nothing to do with science. At the same time, the United Nations came out by reducing man's contribution by 25 percent. That is huge. And reducing the anticipated sea level by one-half and also coming out with a statement that livestock emissions are greater than man emissions and even the transportation sector.

But we have an honest difference of opinion, and it will surprise a lot of people to know that we agree on a lot of things, such as the WRDA bill coming up that everyone in this room is very much concerned about today. We will be discussing the State perspectives on climate change. I would say to my friend, Governor Corzine, I used to say, and I am sure that Senator Voinovich would probably agree with me, with his background, I tell my fellow Senators sometimes, I know what a hard job is, I have been a mayor of a major city. The same thing is true with being Governor of a State. So I recognize you have a hard job right now.

We are discussing, as you know, the States are, I consider to be 50 laboratories in this Country, each one taking a unique policy pathway forward. In doing so, the experiments give Federal policymakers examples of what policies work, what policies don't work. And of course, the Federal Government also has examples of failed ideas it should avoid repeating at all costs. Cap and trade ranks high among these.

Multiple approaches have been taken that purport to address climate change. Some States have clean coal R&D programs. Others have tax credits for renewable energy and/or hybrid cars. Still others have renewable portfolio standards. Most of these States have taken a pragmatic approach that recognizes the uniqueness of their circumstances. A group of northeastern States and California have enacted cap and trade programs to reduce emissions. Additionally, four Governors have pledged to come up with plans to reduce emissions. Today we hear how ambitious and important they are and what they plan to accomplish.

But these programs haven't accomplished anything so far. They are simply open promises that won't be kept and denials about costs that will surely be paid.

California is a good example of an empty promise. It passed a law bringing emissions back to the 1990 levels by 2020. This baseline was not chosen arbitrarily, but to support the Kyoto Protocol, which also uses 1990 baseline. Since Kyoto is the only cap and trade program that is underway, I think it is worth asking, how well has that worked? Of the 15 western European countries that have signed onto Kyoto, and have ratified it, only 2 will meet their targets, that is Sweden and Britain. Great Britain only because it eliminated its coal industry in the early 1990s.

Like most signatories, Canada and Japan won't meet their targets. The simple fact is that the United States has spent more Federal dollars on basic science as well as research and development and done more to reduce our emissions rate than Europe has since 2000. It is interesting, we have actually reduced our emission rates more in the United States than western Europe has. One thing, as long as we are talking about Canada, it is very interesting, even though they were one of the first ones to sign on, to ratify the Kyoto Treaty, the 60 scientists that advised the Canadians are now petitioning Prime Minister Harper to withdraw, saying that "If we had known 10 years ago what we know today, we would not have been a part of Kyoto."

The simple fact is, jobs are fleeing the European Union because of its experiment into cap and trade. China, which will become the world's biggest emitter of greenhouses in 2009 and India and other

developing nations will never sign on. As the Deputy Director General of China's Office of Global Environmental Affairs said in October, "you cannot tell people who are struggling to earn enough to eat that they need to reduce their emissions." That is why California and the RGGI programs, I believe, will fail. Although each of these regions has yet to pay the cost, there will be costs and jobs will flee these States. Cost will go up and purchase power will decline.

In RGGI States, for instance, the Charles River and Associates, the CRA estimate, estimated a similar proposal which would cost the region some 18,000 jobs in 2010. Electricity prices, according to them, this is CRA, will rise by 9 percent, hitting the elderly and the poor the hardest. The poor are having to shoulder the increased burden of more than double that of the rich, due to the cost of energy. Similarly, purchasing power would decline by $270 per family.

It is interesting that this is based on this reduced program, while the Wharton Econometric Survey uses figures 10 times greater, the average family of four, costing them in what we would refer to as a tax increase, some $2,750 a year. So let's be honest about these programs and their companion proposals are here in Congress. They are the biggest tax increases in history. In fact, they are worse than taxes, because they will cost more and be less effective.

The only reason the alarmists have not proposed an outright tax yet is that they know it will be more difficult to reward the climate profiteers supporting them in their efforts, such as we witnessed down in TXU only in the last few weeks.

So I would simply say in closing that I find it ironic that deliverables are so openly crafting programs to directly benefit powerful corporations and interest groups at the expense of the poor, the elderly, the fixed income and the working class. Thank you, Madam Chairman.

[The prepared statement of Senator Inhofe follows:]

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

Thank you for holding this hearing, Madame Chairman.

Today we are discussing State perspectives on climate change. As you know, the States are 50 laboratories of this country—each taking a unique policy pathway forward. In doing so, the experiments give Federal policymakers examples of what policies work. Of course, the Federal Government also has examples of failed ideas it should avoid repeating at all costs—cap and trade ranks high among these.

Multiple approaches have been taken that purport to address climate change. Some States have clean coal R&D programs, others have tax credits for renewable energy or hybrid cars, and still others have renewable portfolio standards. Most of these States have taken a pragmatic approach that recognizes the uniqueness of their circumstances.

A group of Northeastern States and California have enacted cap and trade programs to reduce emissions. Additionally, four Governors have joined Governor Schwarzenegger in pledging to come up with plans to reduce emissions. Today we will hear how ambitious and important they are, and what they plan to accomplish. But these programs haven't accomplished anything. They are simply empty promises that won't be kept and denials about costs that will surely be paid.

California is a good example of an empty promise—it passed a law bringing emissions back to 1990 levels by 2020. This baseline was not chosen arbitrarily, but to support the Kyoto Protocol, which also uses a 1990 baseline. Since Kyoto is the only cap and trade program that is under way, it's worth asking—how well is that program working?

Of the 15 original EU countries, only two will meet their targets—Sweden and Britain, and Britain only because it eliminated its coal industry in the early 90s. And like most signatories, Canada and Japan won't meet their targets either. The simple fact is that the United States has spent more Federal dollars on basic science, as well as research and development, and done more to reduce our emissions rate than Europe since 2000. How did we do that?—By rejecting Kyoto's cap and trade approach.

The simple fact is jobs are fleeing the EU because of its experiment into cap and trade. And China—which will become the world's biggest emitter of greenhouse gases in 2009—and India and other developing nations will never sign on. As Lu Xuedu, Deputy Director General of China's Office of Global Environmental Affairs, said in October: "You cannot tell people who are struggling to earn enough to eat that they need to reduce their emissions."

That is why the California and RGGI programs will fail. Although each of these regions has yet to pay the costs, there will be costs. Jobs will flee these States, costs will go up and purchasing power will decline.

In the RGGI States, for instance, Charles River Associates estimated a similar proposal would cost the region 18,000 jobs in 2010. Electricity prices would rise 9 percent, hitting the elderly and poor the hardest, with the poor having to shoulder an increased burden more than double that of the rich due to the costs of energy. Similarly, purchasing power would decline $270 per family in 2010 and worsen annually.

California will fare as badly. While the program they plan to implement the law is so uncertain economic modeling is difficult, the targets and timing suggest that the Wharton Econometric Forecasting Associates Kyoto Protocol study is useful. That study found California would see its economy decline by about 1 percent and 278,000 jobs.

Let's be honest about what these programs and their companion proposals here in Congress really are—they are the biggest tax increase in U.S. history. In fact, they are worse than taxes because they will cost more and be less effective. And the only reason the alarmists have not proposed an outright tax yet is they know it will be more difficult to reward the climate profiteers supporting them in their efforts.

In closing, I will simply say that I find it ironic that the liberals are so openly crafting programs to directly benefit powerful corporations and interest groups at the expense of the poor, elderly and working class.

Thank you.

Senator BOXER. I am a bit speechless after that.

[Laughter.]

Senator BOXER. I would like to put in the record the list of bipartisan elected officials who have attacked this issue and include Democrat and Republican Governors. So I would like to ask unanimous consent to place this in the record, showing the bipartisan list of officials who have taken action.

[The referenced material follows:]

State and Regional Initiatives

Bipartisan list of governors who have taken action to address global warming.

- **New England Governors' Initiative:** In 2001, the New England Governors Conference and Eastern Canadian Premiers set a goal of reducing greenhouse gas emissions levels to:
  - 1990 levels by 2010
  - at least 10% below 1990 levels by 2020
  - 75-85% over the long-term
  - **States**: CT, MA, RI, VT, ME, and NH
  - **Gov**: Rowland (R-CT), Swift (R-MA), Almond (R-RI), and Gov. King (I-ME).
- **NY**: In 2002, Gov. Pataki's (R) state energy plan adopted a goal of reducing emissions to:
  - 5% below 1990 levels by 2010
  - 10% below 1990 levels by 2020
- **RI**: In 2002, Gov. Almond's (R) state agencies accepted a goal of reducing emissions levels to:
  - 1990 levels by 2010
  - at least 10% below 1990 levels by 2020
- **VT**: In 2003, Gov. Douglas's (R) executive order adopted the goal of reducing emissions to:
  - 25% below 1990 levels by 2012
  - 50% below 1990 levels by 2028
  - 75% below 1990 levels by 2050
- **MA**: In 2004, Gov. Romney (R) set state goals to reduce greenhouse gas emissions to:
  - 1990 levels by 2010
  - 10% below 1990 levels by 2020
  - 75-85% below 2004 levels in the long term
- **CT**: In 2004, Governor Rell's (R) signed a bill that set goals to reduce emissions to:
  - 1990 levels by 2010
  - 10% below 1990 levels by 2020
  - 75% below 2001 levels in the long term
- **OR**: In 2005, Gov. Kulongoski (D) adopted goals to reduce emissions to:
  - 1990 levels by 2010
  - 10% below 1990 levels by 2020
  - at least 75% below 1990 levels by 2050
- **Mid-West Greenhouse Gas Registry**: In 2005, environmental agencies for six states began efforts to create a voluntary greenhouse gas registry.
  - **States**: IN, MN, OH, WS, MI, IL, and IA.
  - **Gov**: Daniels (R-IN), Pawlenty (R-MN), Taft (R-OH), Doyle (D- WS), Blagojevich (D-IL), and Granholm (D-MI).
- **AZ**: In 2006, Gov. Napolitano (D) signed an executive order setting a goal of reducing emissions to:
  - 2000 levels by 2020
  - 50% below 2000 levels by 2040
- **NM**: In 2006, Gov. Richardson (D) signed an executive order setting a goal of reducing emissions to:
  - 2000 levels by 2012
  - 10% below 2000 levels by 2020
  - 75% below 2000 levels by 2050
- **MA**: In 2006, Gov. Romney (R) created regulations limiting emissions from power plants.
- **IL**: In 2007, Gov. Blagojevich (D) announced a goal of reducing emissions to:
  - 1990 levels by 2020
  - 60% below 1990 levels by 2050
- **WA**: In 2007, Gov. Gregoire (D) signed an executive order setting a goal of reducing emission to:
  - 1990 levels by 2020
  - 25% below 1990 levels by 2035
  - 50% below 1990 levels by 2050

Senator BOXER. I also would like to ask unanimous consent that I be able to place into the record a statement from the European Union which says they are on track to meet their Kyoto commitment. It is a letter to me on that point.

[The referenced material follows:]

EUROPEAN UNION

DELEGATION OF THE EUROPEAN COMMISSION

Head of Delegation

FEB 22 2007
D/272

The Honorable Barbara Boxer
Chairman, Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Madame Chairman,

In recent publications in the media and in statements by U.S. Administration officials as well as at the Hearing on the U.S. Climate Action Partnership report, which you organized in the Senate Committee on Environment and Public Works on February 13, 2007, incorrect or incomplete information has been presented about the European Union (EU) climate policy. In particular, this concerns the EU's achievements to date by comparison to achievements in the U.S., and whether the EU will meet its obligation under the Kyoto Protocol, which is to reduce its emissions by 8% by 2012.

This letter is intended to put the facts before you[1].

To start, I would like to address one major misunderstanding in the discussions in the U.S.: we hear statements such as those from Senator Inhofe that only a few EU countries are on target to meet their Kyoto obligations and that other EU members will fail to do so, thus implying that the EU will not meet its Kyoto obligations. That is not correct. The EU is on track to meet its Kyoto commitment.

Of course, the performances of individual EU member states vary, but under the Kyoto Protocol, it is the 15 countries that were EU Member States when the Kyoto Protocol was signed in 1997 (EU-15) that have a joint commitment to reduce emissions by 8% by 2012[2]. Individual EU-15 Member States do also have individual targets but these are EU internal targets in the framework of our joint commitment. This joint commitment allows some EU countries to increase their emissions, while others reduce theirs significantly. The contributions of each Member State to achieving the 8% reduction are set down in EU law and are legally binding. It is thus inappropriate to assess the EU's overall performance on the basis of the performance of a few individual Member States. If the U.S. ratified the Kyoto Protocol with its foreseen 7% reduction target, I doubt if the U.S. would agree that its overall performance should be assessed by focusing on a few individual states rather than the overall U.S. performance.

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[1] See also the 2006 Progress Report COM(2006)658 at http://ec.europa.eu/environment/climat/pdf/kyotoreport_en.pdf

[2] Since 2004, 12 new countries have become members of the EU, most recently Bulgaria and Romania in January 2007. Ten of these twelve have Kyoto targets ranging between -6 and -8% reductions on 1990 levels. Cyprus and Malta do no have targets.

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In the year 2000, the 15 EU Member States had stabilized greenhouse gas emissions at 1990 level and by 2004 they had reduced their emissions by 0.8% compared to 1990.

In the U.S., emissions grew by 15.8% between 1990 and 2004. The U.S. still lags far behind the EU which has seen its economy grow with a far lesser effect in terms of emissions.

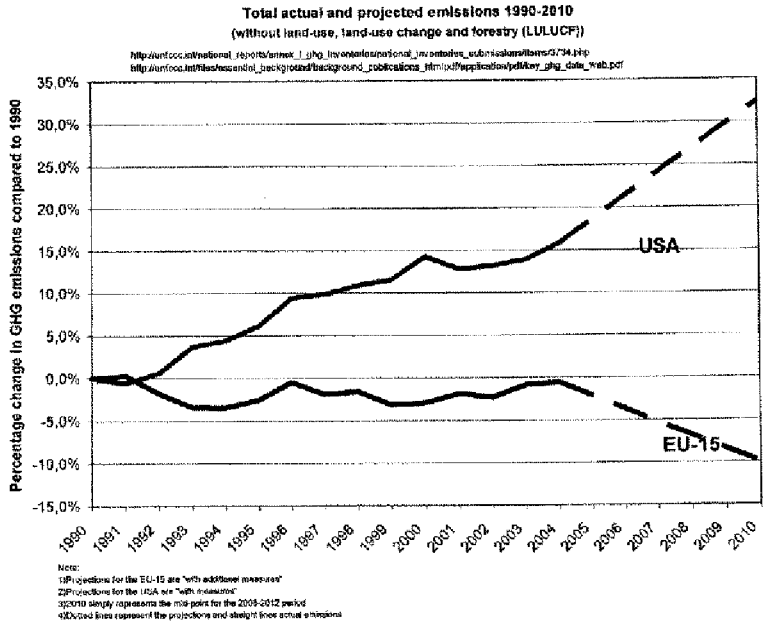
Between 1990 and 2002, greenhouse gas (GHG) emissions per unit of GDP decreased proportionately more in the EU than they did in the U.S., although they were at similar levels back in 1990. It seems that despite its improvement in recent years, the U.S. is not fully exploiting its potential for emission reductions.

When examining other important indicators such as energy use per capita or GHG emissions per capita which take into account the significant population increase in the U.S. in recent years the energy use and GHG emission figures for the U.S. have remained almost double of what they are for the EU. Increasing energy efficiency would decrease GHG emissions whilst reducing fuel imports.

The 2000-2004 time period

During the period 2000-2004, recently chosen as a reference period by the U.S. Administration, emissions in the U.S. grew more slowly than in the EU. However, in absolute terms the U.S. increase in GHG over that period was still more than in any other country in the world or than the EU as a whole (US: 29 million tonnes of CO_2, EU-27: just under 21 million tonnes of CO_2).

The selection of the limited 2000-2004 period for comparison of progress in reducing GHG emissions is far from representative. It is the longer term that is relevant in terms of successfully addressing climate change. The chart below, based on official UNFCCC data, shows how US and EU emissions have evolved and are projected to evolve between 1990 and 2010.



Furthermore, despite the developments in relative GHG emissions trends in the U.S. over the last couple of years, the future is not promising. By 2010, emissions in the U.S. are projected to be 32.4% above 1990 levels.

In contrast, the action taken at the EU level and currently under implementation at the national Member State level, is projected to result in an absolute reduction in emissions of 10.8 % from the base year 1990 by 2010 across the 25 Member States and by 8% for the EU-15 when existing (0.6%) and additional measures (4%) as well as the use of Kyoto mechanisms (2.6%) and carbon sinks (0.8%) are taken into account.

Amongst other measures such as a wide range of energy efficiency, renewable energy targets, vehicle emission and fuel standards to reduce greenhouse gas emissions, the EU has introduced a EU-wide cap and trade system which provides industry with the necessary (financial) incentives to take action and innovate in the most cost effective way.

The EU Emission Trading System (ETS) started January 1, 2005 for a three year pilot phase. Currently, it involves more than 10,000 companies, covering around 2 billion tonnes of CO_2 emissions (half of EU's total CO_2 emissions) with transactions valued at $ 19 billion in 2006. Emissions trading has two main advantages: it introduces climate change considerations in industry's financial bottom line and through the linking directive it opens up markets to Clean Development Mechanism projects in developing countries. Currently, credits from emission-

reducing projects in 169 countries representing more than 90% of the global population can be used by companies to meet part of their reduction objectives.

In addition to industry, the EU member states are also making use of the Kyoto mechanisms. The projected use of Kyoto mechanisms by 10 Member States is expected to amount to 110.6 million tonnes of CO_2eq. per year of the commitment period. This amount corresponds to over 30% of the total required emission reduction for the EU-15 of about 342 million tonnes CO_2 equivalents per year during the first commitment period. The total budget already allocated by member states amounts to about 3 billion EURO.

The EU ETS pilot phase has shown that there is room for improvement in the initial allocation, which is being addressed. An over-allocation of emissions permits in some Member States and in small and medium sized sectors for this initial period, resulting from the use of projected emissions and from a lack of data on actual emissions when the system was launched, has led to a relative drop in permit prices for the 2005-7 period. On the other hand, these price movements alongside high trading volumes are an indication that the market mechanism itself is functioning as it should. Thanks to reporting required under the EU ETS, we have the data to improve allocations for the second trading period which runs from 2008 and 2012. This is already reflected in the forward price for second phase permits. EU ETS is a very important tool for the future. We are currently working on streamlining its design for trading from 2013 onwards and expanding it to more sectors and other GHGs.

For your information, I attach some annexes with an overview of EU policies and measures, and a recent table on the EU performance under Kyoto.

The way forward

The EU is pleased to see that the climate debate is gaining momentum in Congress, in many states and with other stakeholders, and that the U.S. as a whole has started to make progress in reducing the growth of its emissions. The EU is certainly keen to exchange experiences with all interested parties in the U.S. regarding new and existing policies and measures, research programs and other initiatives and assess what is the best way forward in tackling the pressing and long term challenge of climate change. The EU has gained a lot of experience of using market-based measures such as emissions trading, and is keen to share this experience and avoid any need for the US to "reinvent the wheel" when it comes to the building blocks of emissions trading such as monitoring requirements and electronic registries.

On the basis of the scientific assessment of man-made climate change impacts, the EU's objective is to limit the average increase in global temperature to a maximum of 2 degrees Celsius (3.6 Fahrenheit) above pre-industrial levels. If the world stays within this threshold, we will still see some serious impacts, but we would have a reasonable chance of avoiding catastrophic consequences. A 3.6 degree Fahrenheit target would translate into making sure that global GHG emissions peak by 2020 and then fall drastically – by around 50% over 1990 levels to ensure that atmospheric concentrations stabilize at around 450 ppm. The EU's own calculations show that these concentrations could be achieved if developed countries as a group were to reduce their emissions by 30% by 2020 and by 60% - 80% by 2050, and if developing countries with some support limit their growth in emissions before 2020 and to reduce them in absolute terms thereafter.

The EU is looking for a shared vision amongst major GHG emitters of what needs to be done to tackle climate change. We propose these objectives and reduction paths as a framework to guide action. To underline its commitment to action, the EU has agreed an independent reduction target of at least 20% by 2020, if there is no outcome of the negotiations on a global binding post-2012 agreement.

The EU is open to discussing the details of this framework and of the actions needed with other countries and with the US in particular. One thing is nonetheless certain: time is running short and decisions need to be made as soon as possible.

Yours sincerely,

John Bruton

Ambassador

Annex I:

European Climate Change Programme (ECCP)

Status of implementation of important ECCP I identified policies and measures

Measure	Reduction potential EU-15, 2010 (Mt. CO_2)	Entry into force	Starting to deliver
EU emission trading scheme	~ NAP2	2003	2005
Link Joint Implementation (JI)/ Clean Development Mechanism (CDM) projects to emission trading	~ NAP2	2004	2005/2008
F-Gases Regulation and Directive on Mobile Air Conditioning	23	2006	2008
Dir. on the promotion of electricity from renewable energy sources	100-125	2001	2003
Directive on the promotion of Cogeneration of Heat and Power (CHP)	65	2004	2006
Directive on energy performance of buildings	35-45	2003	2006
Directive on the promotion of transport bio-fuels	35-40	2003	2005
Directive on the promotion of energy efficiency and energy services	40-55	2003	2006
ACEA voluntary agreement	75-80	1998	1999
Energy labeling directives	20	1992	1993
Total	**393-453**		

Note: The emission reduction potential for the various ECCP measures are (ex-ante) estimates. The 'ex ante' ECCP evaluation of the potential of a certain measure does not necessarily coincide with the actual realisation in the field, as not all of the detailed provisions of the proposals or adopted measures have been taken into account in the pre-evaluation. Another reason is that the estimated potential is sometimes based on reaching certain (indicative) targets, which will need to be proven in practice (eg., CHP and biofuels proposals).

Annex II: the EU's Kyoto performance

Greenhouse gas emissions trends and Kyoto Protocol targets for 2008-2012
(source: European Environment Agency, 2006)

MEMBER STATE	Base year [1] (million tonnes)	2004 (million tonnes)	Change base year–2004 (%)	Change 2003–2004 (million tonnes)	Change 2003–2004 (%)	Targets 2008–12 under Kyoto Protocol and "EU burden sharing" (%)	Distance to target indicator (index points) in brackets, excluding Kyoto mechanisms and sinks (%)
Austria	78.9	91.3	+15.7 %	-1.2	-1.3 %	-13.0 %	+17.9 (+24.8)
Belgium	146.9	147.9	+0.7 %	0.3	+0.2 %	-7.5 %	+1.8 (+5.9)
Cyprus [2]	6.0	8.9	+48.2 %	-0.3	-3.0 %	no target	no target
Czech Republic	196.3	147.1	-25.1 %	-0.5	-0.3 %	-8.0 %	-19.9 (-19.5)
Denmark	69.3	68.1	-1.8 %	-6.0	-8.1 %	-21.0 %	+7.9 (+12.9)
Estonia	42.6	21.3	-50.0 %	0.1	+0.7 %	-8.0 %	-44.4
Finland	71.1	81.4	+14.5 %	-4.2	-4.9 %	0.0 %	+13.1 (+14.5)
France	567.1	562.6	-0.8 %	1.5	+0.3 %	0.0 %	-1.2 (-0.8)
Germany	1230.0	1015.3	-17.5 %	-9.1	-0.9 %	-21.0 %	-2.8
Greece	111.1	137.6	+23.9 %	0.3	+0.3 %	+25.0 %	+6.4
Hungary	122.2	83.1	-32.0 %	-0.2	-0.2 %	-6.0 %	-27.8
Ireland	55.8	68.5	+22.7 %	0.1	+0.1 %	+13.0 %	+6.5 (+13.6)
Italy	519.6	582.5	+12.1 %	5.1	+0.9 %	-6.5 %	+9.9 (+16.7)
Latvia	25.9	10.7	-58.5 %	0.0	+0.4 %	-8.0 %	-52.9
Lithuania	50.9	20.3	-60.1 %	3.1	+17.9 %	-8.0 %	-54.5
Luxembourg	12.7	12.7	+0.3 %	1.3	+11.3 %	-28.0 %	+3.3 (+19.9)
Malta [2]	2.2	3.2	+45.9 %	0.1	+4.2 %	no target	no target
The Netherlands	214.3	217.8	+1.6 %	2.5	+1.1 %	-6.0 %	-0.7 (+5.8)
Poland	565.3	386.4	-31.6 %	3.7	+1.0 %	-6.0 %	-27.4
Portugal	60.0	84.5	+41.0 %	0.9	+1.0 %	+27.0 %	+14.6 (+22.1)
Slovakia	73.2	51.0	-30.3 %	-0.1	-0.1 %	-8.0 %	-24.7
Slovenia	20.2	20.1	-0.8 %	0.4	+2.0 %	-8.0 %	-1.0 (+4.8)
Spain	289.4	427.9	+47.9 %	19.7	+4.8 %	+15.0 %	+31.2 (+37.4)
Sweden	72.5	69.9	-3.6 %	-1.1	-1.5 %	+4.0 %	-8.4 (-6.4)
The United Kingdom	767.9	659.3	-14.1 %	1.3	+0.2 %	-12.5 %	-5.8 (-5.4)
EU-15	4266.4	4227.4	-0.9 %	11.5	+0.3 %	-8.0 %	+2.3 (+4.7)
EU-10	1104.9	752.2	-31.9%	6.5	+0.9%	no common target	no common target
EU-25	5371.3	4979.6	-7.3 %	18.1	+0.4 %	no common target	no common target

([1]) For EU-15 the base year for CO_2, CH_4 and N_2O is 1990; for the fluorinated gases 13 Member States have indicated to select 1995 as the base year, whereas Austria and France have chosen 1990. As the EC inventory is the sum of Member States' inventories, the EC base year estimates for fluorinated gas emissions are the sum of 1995 emissions for 13 Member States and 1990 emissions for Austria and France.

([2]) Cyprus and Malta did not provide GHG emission estimates for 2004, therefore the data provided in this table is based on gap filling.

The base-year emissions reported in this table are the latest data available from national greenhouse gas inventories (6 June 2006). Final data will be available in the report on the EU's assigned amount (pursuant to Article 3, Paragraphs 7 and 8 of the Kyoto Protocol) under the UNFCCC, due end of 2006.

Note: Malta and Cyprus do not have Kyoto targets.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

Climate Change 2007: The Physical Science Basis

Summary for Policymakers

Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change

This Summary for Policymakers was formally approved at the 10th Session of Working Group I of the IPCC, Paris, February 2007.

Note:
Text, tables and figures given here are final but subject to copy-editing.

Corrections made as of February 5th, 2007

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Senator INHOFE. Madam Chairman, for the record, I would like to submit a list of scientists who at one time, 10 years ago, were very strong supporters of reducing man-made gases, and now realize that science has changed and they are on the other side of the issue.

Senator BOXER. We would be happy to put that in the record.

[The referenced material follows:]

Posted by Marc Morano – Marc_Morano@EPW.Senate.Gov - 9:14 PM ET - May 15, 2007

Climate Momentum Shifting: Prominent Scientists Reverse Belief in Man-made Global Warming - Now Skeptics

Growing Number of Scientists Convert to Skeptics After Reviewing New Research

Following the U.S. Senate's vote today on a global warming measure (see today's AP article: **Senate Defeats Climate Change Measure,**) it is an opportune time to examine the recent and quite remarkable momentum shift taking place in climate science. Many former believers in catastrophic man-made global warming have recently reversed themselves and are now climate skeptics. The names included below are just a sampling of the prominent scientists who have spoken out recently to oppose former Vice President Al Gore, the United Nations and the media driven "consensus" on man-made global warming.

The list below is just the tip of the iceberg. A more detailed and comprehensive sampling of scientists who have only recently spoken out against climate hysteria will be forthcoming in a soon to be released U.S. Senate report. Please stay tuned to this website, as this new government report is set to redefine the current climate debate.

In the meantime, please review the list of scientists below and ask yourself why the media is missing one of the biggest stories in climate of 2007. Feel free to distribute the partial list of scientists who recently converted to skeptics to your local schools and universities. The voices of rank and file scientists opposing climate doomsayers can serve as a counter to the alarmism that children are being exposed to on a daily basis. (See Washington Post April 16, 2007 article about kids fearing of a "climactic Armageddon") The media's climate fear factor seemingly grows louder even as the latest science grows less and less alarming by the day. (See Der Spiegel May 7, 2007 article: Not the End of the World as We Know It) It is also worth noting that the proponents of climate fears are increasingly attempting to suppress dissent by skeptic. (See UPI May 10, 2007 article: U.N. official says it's 'completely immoral' to doubt global warming fears)

Once Believers, Now Skeptics – (Link to web version http://epw.senate.gov/public/index.cfm?FuseAction=Minority.Blogs&ContentRecord_id=927b9303-802a-23ad-494b-dccb00b51a12&Region_id=&Issue_id=)

Geophysicist Dr. Claude Allegre, a top geophysicist and French Socialist who has authored more than 100 scientific articles and written 11 books and received numerous scientific awards including the Goldschmidt Medal from the Geochemical Society of the United States, converted from climate alarmist to skeptic in 2006. Allegre, who was one of the first scientists to sound global warming fears 20 years ago, now says the cause of climate change is "unknown" and accused the "prophets of doom of global warming" of

being motivated by money, noting that "the ecology of helpless protesting has become a very lucrative business for some people!" "Glaciers' chronicles or historical archives point to the fact that climate is a capricious phenomena. This fact is confirmed by mathematical meteorological theories. So, let us be cautious," Allegre explained in a September 21, 2006 article in the French newspaper L'EXPRESS. The National Post in Canada also profiled Allegre on March 2, 2007, noting "Allegre has the highest environmental credentials. The author of early environmental books, he fought successful battles to protect the ozone layer from CFCs and public health from lead pollution." Allegre now calls fears of a climate disaster "simplistic and obscuring the true dangers" mocks "the greenhouse-gas fanatics whose proclamations consist in denouncing man's role on the climate without doing anything about it except organizing conferences and preparing protocols that become dead letters." Allegre, a member of both the French and U.S. Academy of Sciences, had previously expressed concern about manmade global warming. "By burning fossil fuels, man enhanced the concentration of carbon dioxide in the atmosphere which has raised the global mean temperature by half a degree in the last century," Allegre wrote 20 years ago. In addition, Allegre was one of 1500 scientists who signed a November 18, 1992 letter titled "World Scientists' Warning to Humanity" in which the scientists warned that global warming's "potential risks are very great."

Geologist Bruno Wiskel of the University of Alberta recently reversed his view of man-made climate change and instead became a global warming skeptic. Wiskel was once such a big believer in man-made global warming that he set out to build a "Kyoto house" in honor of the UN sanctioned Kyoto Protocol which was signed in 1997. Wiskel wanted to prove that the Kyoto Protocol's goals were achievable by people making small changes in their lives. But after further examining the science behind Kyoto, Wiskel reversed his scientific views completely and became such a strong skeptic that he recently wrote a book titled "The Emperor's New Climate: Debunking the Myth of Global Warming." A November 15, 2006 Edmonton Sun article explains Wiskel's conversion while building his "Kyoto house": "Instead, he said he realized global warming theory was full of holes and 'red flags,' and became convinced that humans are not responsible for rising temperatures." Wiskel now says "the truth has to start somewhere." Noting that the Earth has been warming for 18,000 years, Wiskel told the Canadian newspaper, "If this happened once and we were the cause of it, that would be cause for concern. But glaciers have been coming and going for billions of years." Wiskel also said that global warming has gone "from a science to a religion" and noted that research money is being funneled into promoting climate alarmism instead of funding areas he considers more worthy. "If you funnel money into things that can't be changed, the money is not going into the places that it is needed," he said.

Astrophysicist Dr. Nir Shaviv, one of Israel's top young award winning scientists, recanted his belief that manmade emissions were driving climate change. ""Like many others, I was personally sure that CO2 is the bad culprit in the story of global warming. But after carefully digging into the evidence, I realized that things are far more complicated than the story sold to us by many climate scientists or the stories regurgitated by the media. In fact, there is much more than meets the eye," Shaviv said in February 2, 2007 Canadian National Post article. According to Shaviv, the C02 temperature link is

only "incriminating circumstantial evidence." "Solar activity can explain a large part of the 20th-century global warming" and "it is unlikely that [the solar climate link] does not exist," Shaviv noted pointing to the impact cosmic- rays have on the atmosphere. According to the National Post, Shaviv believes that even a doubling of CO2 in the atmosphere by 2100 "will not dramatically increase the global temperature." "Even if we halved the CO2 output, and the CO2 increase by 2100 would be, say, a 50% increase relative to today instead of a doubled amount, the expected reduction in the rise of global temperature would be less than 0.5C. This is not significant," Shaviv explained. Shaviv also wrote on August 18, 2006 that a colleague of his believed that "CO2 should have a large effect on climate" so "he set out to reconstruct the phanerozoic temperature. He wanted to find the CO2 signature in the data, but since there was none, he slowly had to change his views." Shaviv believes there will be more scientists converting to man-made global warming skepticism as they discover the dearth of evidence. "I think this is common to many of the scientists who think like us (that is, that CO2 is a secondary climate driver). Each one of us was working in his or her own niche. While working there, each one of us realized that things just don't add up to support the AGW (Anthropogenic Global Warming) picture. So many had to change their views," he wrote.

Mathematician & engineer Dr. David Evans, who did carbon accounting for the Australian Government, recently detailed his conversion to a skeptic. "I devoted six years to carbon accounting, building models for the Australian government to estimate carbon emissions from land use change and forestry. When I started that job in 1999 the evidence that carbon emissions caused global warming seemed pretty conclusive, but since then new evidence has weakened the case that carbon emissions are the main cause. I am now skeptical," Evans wrote in an April 30, 2007 blog. "But after 2000 the evidence for carbon emissions gradually got weaker -- better temperature data for the last century, more detailed ice core data, then laboratory evidence that cosmic rays precipitate low clouds," Evans wrote. "As Lord Keynes famously said, 'When the facts change, I change my mind. What do you do, sir?'" he added. Evans noted how he benefited from man-made climate fears as a scientist. "And the political realm in turn fed money back into the scientific community. By the late 1990's, lots of jobs depended on the idea that carbon emissions caused global warming. Many of them were bureaucratic, but there were a lot of science jobs created too. I was on that gravy train, making a high wage in a science job that would not have existed if we didn't believe carbon emissions caused global warming. And so were lots of people around me; and there were international conferences full of such people. And we had political support, the ear of government, big budgets, and we felt fairly important and useful (well, I did anyway). It was great. We were working to save the planet! But starting in about 2000, the last three of the four pieces of evidence outlined above fell away or reversed," Evans wrote. "The pre-2000 ice core data was the central evidence for believing that atmospheric carbon caused temperature increases. The new ice core data shows that past warmings were *not* initially caused by rises in atmospheric carbon, and says nothing about the strength of any amplification. This piece of evidence casts reasonable doubt that atmospheric carbon had any role in past warmings, while still allowing the possibility that it had a supporting role," he added. "Unfortunately politics and science have become even more entangled. The science of global warming has become a partisan political issue, so positions become more

entrenched. Politicians and the public prefer simple and less-nuanced messages. At the moment the political climate strongly supports carbon emissions as the cause of global warming, to the point of sometimes rubbishing or silencing critics," he concluded. (Evans bio link)

Climate researcher Dr. Tad Murty, former Senior Research Scientist for Fisheries and Oceans in Canada, also reversed himself from believer in man-made climate change to a skeptic. "I stated with a firm belief about global warming, until I started working on it myself," Murty explained on August 17, 2006. "I switched to the other side in the early 1990's when Fisheries and Oceans Canada asked me to prepare a position paper and I started to look into the problem seriously," Murty explained. Murty was one of the 60 scientists who wrote an April 6, 2006 letter urging withdrawal of Kyoto to Canadian prime minister Stephen Harper which stated in part, "If, back in the mid-1990s, we knew what we know today about climate, Kyoto would almost certainly not exist, because we would have concluded it was not necessary."

Botanist Dr. David Bellamy, a famed UK environmental campaigner, former lecturer at Durham University and host of a popular UK TV series on wildlife, recently converted into a skeptic after reviewing the science and now calls global warming fears "poppycock." According to a May 15, 2005 article in the UK Sunday Times, Bellamy said "global warming is largely a natural phenomenon. The world is wasting stupendous amounts of money on trying to fix something that can't be fixed." "The climate-change people have no proof for their claims. They have computer models which do not prove anything," Bellamy added. Bellamy's conversion on global warming did not come without a sacrifice as several environmental groups have ended their association with him because of his views on climate change. The severing of relations came despite Bellamy's long activism for green campaigns. The UK Times reported Bellamy "won respect from hardline environmentalists with his campaigns to save Britain's peat bogs and other endangered habitats. In Tasmania he was arrested when he tried to prevent loggers cutting down a rainforest."

Climate scientist Dr. Chris de Freitas of The University of Auckland, N.Z., also converted from a believer in man-made global warming to a skeptic. "At first I accepted that increases in human caused additions of carbon dioxide and methane in the atmosphere would trigger changes in water vapor etc. and lead to dangerous 'global warming,' But with time and with the results of research, I formed the view that, although it makes for a good story, it is unlikely that the man-made changes are drivers of significant climate variation." de Freitas wrote on August 17, 2006. "I accept there may be small changes. But I see the risk of anything serious to be minute," he added. "One could reasonably argue that lack of evidence is not a good reason for complacency. But I believe the billions of dollars committed to GW research and lobbying for GW and for Kyoto treaties etc could be better spent on uncontroversial and very real environmental problems (such as air pollution, poor sanitation, provision of clean water and improved health services) that we know affect tens of millions of people," de Freitas concluded. de Freitas was one of the 60 scientists who wrote an April 6, 2006 letter urging withdrawal of Kyoto to Canadian prime minister Stephen Harper which stated in part, "Significant

[scientific] advances have been made since the [Kyoto] protocol was created, many of which are taking us away from a concern about increasing greenhouse gases."

Meteorologist Dr. Reid Bryson, the founding chairman of the Department of Meteorology at University of Wisconsin (now the Department of Oceanic and Atmospheric Sciences, was pivotal in promoting the coming ice age scare of the 1970's (See Time Magazine's 1974 article "Another Ice Age" citing Bryson: & see Newsweek's 1975 article "The Cooling World" citing Bryson) has now converted into a leading global warming skeptic. In February 8, 2007 Bryson dismissed what he terms "sky is falling" man-made global warming fears. Bryson, was on the United Nations Global 500 Roll of Honor and was identified by the British Institute of Geographers as the most frequently cited climatologist in the world. "Before there were enough people to make any difference at all, two million years ago, nobody was changing the climate, yet the climate was changing, okay?" Bryson told the May 2007 issue of Energy Cooperative News. "All this argument is the temperature going up or not, it's absurd. Of course it's going up. It has gone up since the early 1800s, before the Industrial Revolution, because we're coming out of the Little Ice Age, not because we're putting more carbon dioxide into the air," Bryson said. "You can go outside and spit and have the same effect as doubling carbon dioxide," he added. "We cannot say what part of that warming was due to mankind's addition of 'greenhouse gases' until we consider the other possible factors, such as aerosols. The aerosol content of the atmosphere was measured during the past century, but to my knowledge this data was never used. We can say that the question of anthropogenic modification of the climate is an important question -- too important to ignore. However, it has now become a media free-for-all and a political issue more than a scientific problem," Bryson explained in 2005.

Global warming author and economist Hans H.J. Labohm started out as a man-made global warming believer but he later switched his view after conducting climate research. Labohm wrote on August 19, 2006, "I started as a anthropogenic global warming believer, then I read the [UN's IPCC] Summary for Policymakers and the research of prominent skeptics." "After that, I changed my mind," Labohn explained. Labohn co-authored the **2004 book "Man-Made Global Warming: Unraveling a Dogma," with chemical engineer Dick Thoenes who was the former chairman of the Royal Netherlands Chemical Society**. Labohm was one of the 60 scientists who wrote an April 6, 2006 letter urging withdrawal of Kyoto to Canadian prime minister Stephen Harper which stated in part, "'Climate change is real' is a meaningless phrase used repeatedly by activists to convince the public that a climate catastrophe is looming and humanity is the cause. Neither of these fears is justified. Global climate changes all the time due to natural causes and the human impact still remains impossible to distinguish from this natural 'noise.'"

Paleoclimatologist Tim Patterson, of Carlton University in Ottawa converted from believer in C02 driving the climate change to a skeptic. "I taught my students that CO2 was the prime driver of climate change," Patterson wrote on April 30, 2007. Patterson said his "conversion" happened following his research on "the nature of paleo-commercial fish populations in the NE Pacific." "[My conversion from believer to

climate skeptic] came about approximately 5-6 years ago when results began to come in from a major NSERC (Natural Sciences and Engineering Research Council of Canada) Strategic Project Grant where I was PI (principle investigator)," Patterson explained. "Over the course of about a year, I switched allegiances," he wrote. "As the proxy results began to come in, we were astounded to find that paleoclimatic and paleoproductivity records were full of cycles that corresponded to various sun-spot cycles. About that time, [geochemist] Jan Veizer and others began to publish reasonable hypotheses as to how solar signals could be amplified and control climate," Patterson noted. Patterson says his conversion "probably cost me a lot of grant money. However, as a scientist I go where the science takes me and not were activists want me to go." Patterson now asserts that more and more scientists are converting to climate skeptics. "When I go to a scientific meeting, there's lots of opinion out there, there's lots of discussion (about climate change). I was at the Geological Society of America meeting in Philadelphia in the fall and I would say that people with my opinion were probably in the majority," Patterson told the Winnipeg Sun on February 13, 2007. Patterson, who believes the sun is responsible for the recent warm up of the Earth, ridiculed the environmentalists and the media for not reporting the truth. "But if you listen to [Canadian environmental activist David] Suzuki and the media, it's like a tiger chasing its tail. They try to outdo each other and all the while proclaiming that the debate is over but it isn't -- come out to a scientific meeting sometime," Patterson said. In a separate interview on April 26, 2007 with a Canadian newspaper, Patterson explained that the scientific proof favors skeptics. "I think the proof in the pudding, based on what (media and governments) are saying, (is) we're about three quarters of the way (to disaster) with the doubling of CO2 in the atmosphere," he said. "The world should be heating up like crazy by now, and it's not. The temperatures match very closely with the solar cycles."

Physicist Dr. Zbigniew Jaworowski, chairman of the Central Laboratory for the United Nations Scientific Committee on the Effects of Radiological Protection in Warsaw, took a scientific journey from a believer of man-made climate change in the form of global cooling in the 1970's all the way to converting to a skeptic of current predictions of catastrophic man-made global warming. "At the beginning of the 1970s I believed in man-made climate cooling, and therefore I started a study on the effects of industrial pollution on the global atmosphere, using glaciers as a history book on this pollution," Dr. Jaworowski, wrote on August 17, 2006. "With the advent of man-made warming political correctness in the beginning of 1980s, I already had a lot of experience with polar and high altitude ice, and I have serious problems in accepting the reliability of ice core CO2 studies," Jaworowski added. Jaworowski, who has published many papers on climate with a focus on CO2 measurements in ice cores, also dismissed the UN IPCC summary and questioned what the actual level of C02 was in the atmosphere in a March 16, 2007 report in EIR science entitled "CO2: The Greatest Scientific Scandal of Our Time." "We thus find ourselves in the situation that the entire theory of man-made global warming—with its repercussions in science, and its important consequences for politics and the global economy—is based on ice core studies that provided a false picture of the atmospheric CO2 levels," Jaworowski wrote. "For the past three decades, these well-known direct CO2 measurements, recently compiled and analyzed by Ernst-Georg Beck (Beck 2006a, Beck 2006b, Beck 2007), were completely ignored by climatologists—and

not because they were wrong. Indeed, these measurements were made by several Nobel Prize winners, using the techniques that are standard textbook procedures in chemistry, biochemistry, botany, hygiene, medicine, nutrition, and ecology. The only reason for rejection was that these measurements did not fit the hypothesis of anthropogenic climatic warming. I regard this as perhaps the greatest scientific scandal of our time," Jaworowski wrote. "The hypothesis, in vogue in the 1970s, stating that emissions of industrial dust will soon induce the new Ice Age, seem now to be a conceited anthropocentric exaggeration, bringing into discredit the science of that time. The same fate awaits the present," he added. Jaworowski believes that cosmic rays and solar activity are major drivers of the Earth's climate. Jaworowski was one of the 60 scientists who wrote an April 6, 2006 letter urging withdrawal of Kyoto to Canadian prime minister Stephen Harper which stated in part: "It may be many years yet before we properly understand the Earth's climate system. Nevertheless, significant advances have been made since the protocol was created, many of which are taking us away from a concern about increasing greenhouse gases."

Paleoclimatologist Dr. Ian D. Clark, professor of the Department of Earth Sciences at University of Ottawa, reversed his views on man-made climate change after further examining the evidence. "I used to agree with these dramatic warnings of climate disaster. I taught my students that most of the increase in temperature of the past century was due to human contribution of C02. The association seemed so clear and simple. Increases of greenhouse gases were driving us towards a climate catastrophe," Clark said in a **2005 documentary "Climate Catastrophe Cancelled: What You're Not Being Told About the Science of Climate Change."** "However, a few years ago, I decided to look more closely at the science and it astonished me. In fact there is no evidence of humans being the cause. There is, however, overwhelming evidence of natural causes such as changes in the output of the sun. This has completely reversed my views on the Kyoto protocol," Clark explained. "Actually, many other leading climate researchers also have serious concerns about the science underlying the [Kyoto] Protocol," he added.

Environmental geochemist Dr. Jan Veizer, professor emeritus of University of Ottawa, converted from believer to skeptic after conducting scientific studies of climate history. "I simply accepted the (global warming) theory as given," Veizer wrote on April 30, 2007 about predictions that increasing C02 in the atmosphere was leading to a climate catastrophe. "The final conversion came when I realized that the solar/cosmic ray connection gave far more consistent picture with climate, over many time scales, than did the CO2 scenario," Veizer wrote. "It was the results of my work on past records, on geological time scales, that led me to realize the discrepancies with empirical observations. Trying to understand the background issues of modeling led to realization of the assumptions and uncertainties involved," Veizer explained. "The past record strongly favors the solar/cosmic alternative as the principal climate driver," he added. Veizer acknowledgez the Earth has been warming and he believes in the scientific value of climate modeling. "The major point where I diverge from the IPCC scenario is my belief that it underestimates the role of natural variability by proclaiming CO2 to be the only reasonable source of additional energy in the planetary balance. Such additional energy is needed to drive the climate. The point is that most of the temperature, in both

nature and models, arises from the greenhouse of water vapor (model language 'positive water vapor feedback',) Veizer wrote. "Thus to get more temperature, more water vapor is needed. This is achieved by speeding up the water cycle by inputting more energy into the system," he continued. "Note that it is not CO2 that is in the models but its presumed energy equivalent (model language 'prescribed CO2'). Yet, the models (and climate) would generate a more or less similar outcome regardless where this additional energy is coming from. This is why the solar/cosmic connection is so strongly opposed, because it can influence the global energy budget which, in turn, diminishes the need for an energy input from the CO2 greenhouse," he wrote.

More to follow…

Related Links:

Senator Inhofe declares climate momentum shifting away from Gore (The Politico op ed)

Scientific Smackdown: Skeptics Voted The Clear Winners Against Global Warming Believers in Heated NYC Debate

Global Warming on Mars & Cosmic Ray Research Are Shattering Media Driven "Consensus'

Global Warming: The Momentum has Shifted to Climate Skeptics

Prominent French Scientist Reverses Belief in Global Warming - Now a Skeptic

Top Israeli Astrophysicist Recants His Belief in Manmade Global Warming - Now Says Sun Biggest Factor in Warming

Warming On Jupiter, Mars, Pluto, Neptune's Moon & Earth Linked to Increased Solar Activity, Scientists Say

Panel of Broadcast Meteorologists Reject Man-Made Global Warming Fears- Claim 95% of Weathermen Skeptical

MIT Climate Scientist Calls Fears of Global Warming 'Silly' - Equates Concerns to 'Little Kids' Attempting to "Scare Each Other"

Weather Channel TV Host Goes 'Political'- Stars in Global Warming Film Accusing U.S. Government of 'Criminal Neglect'

Weather Channel Climate Expert Calls for Decertifying Global Warming Skeptics

ABC-TV Meteorologist: I Don't Know A Single Weatherman Who Believes 'Man-Made Global Warming Hype'

The Weather Channel Climate Expert Refuses to Retract Call for Decertification for Global Warming Skeptics

Senator Inhofe Announces Public Release Of "Skeptic's Guide To Debunking Global Warming"

# # #

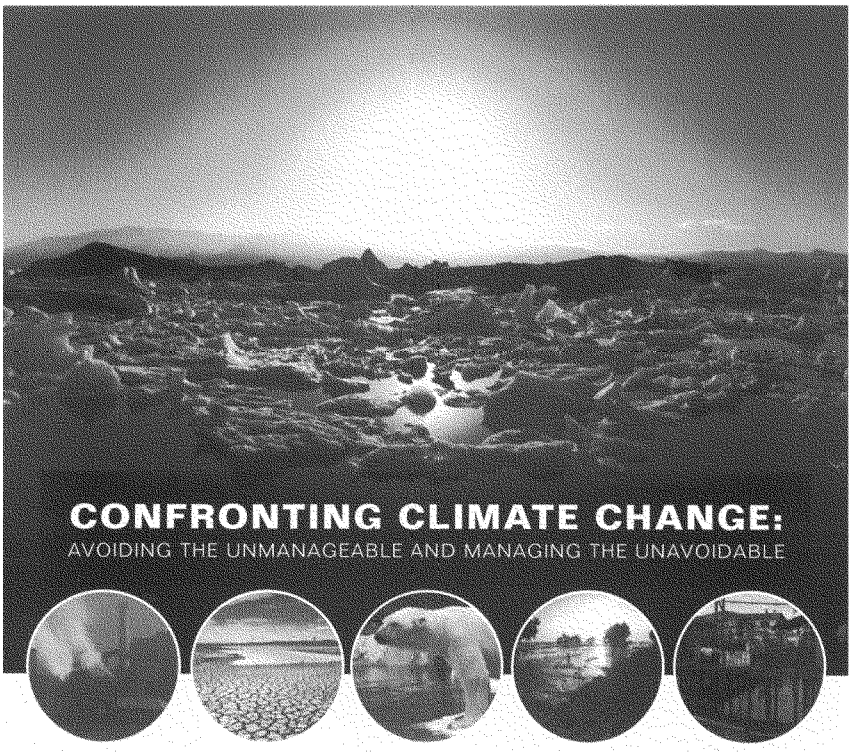
Senator BOXER. In addition, we are also going to put into the record without objection, I hope, a list of the scientists who issued the IPCC report and also this latest report of scientific experts just yesterday who issued this report for the United Nations, Confronting Climate Change. So we will have the list of scientists who change their mind and the list of scientists who are actually putting these reports out as well as the letter from the European Union.

[The referenced material follows:]

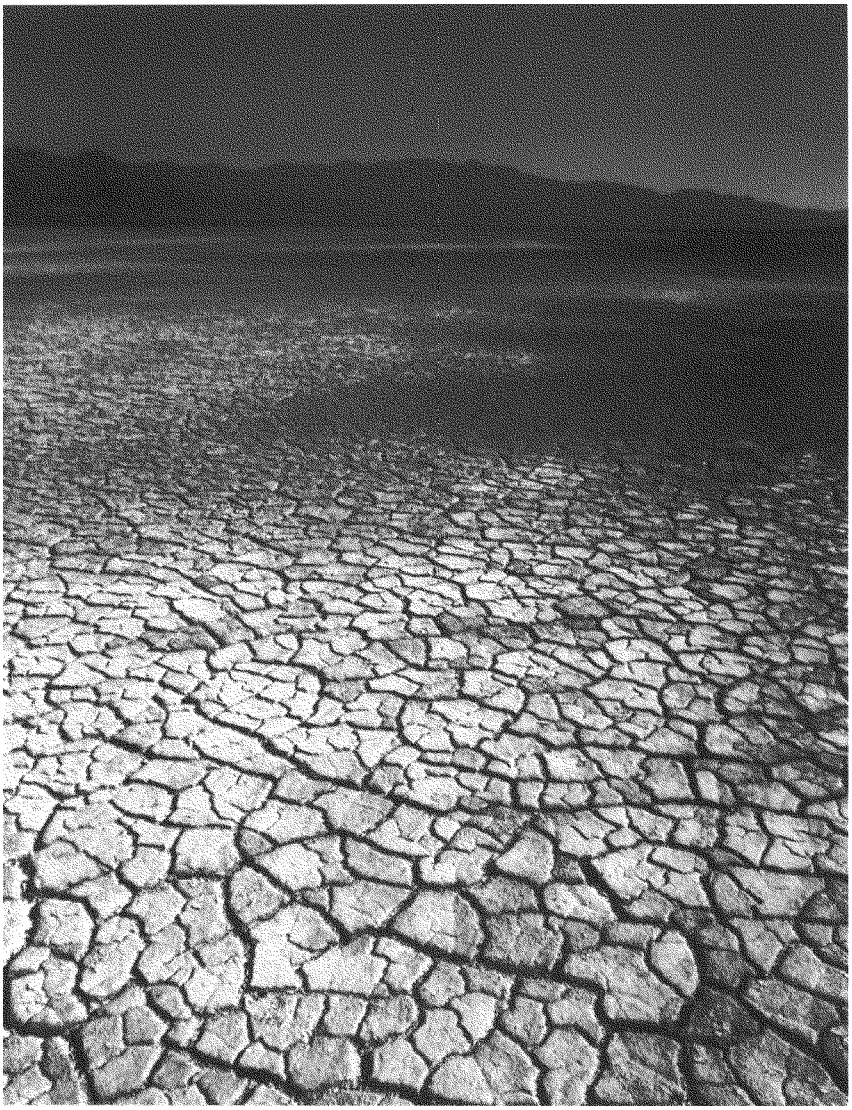
UNITED NATIONS FOUNDATION

SIGMA XI
THE SCIENTIFIC RESEARCH SOCIETY

February 2007
Executive Summary



Executive Summary. Scientific Expert Group Report on Climate Change and Sustainable Development.
Prepared for the 15th Session of the Commission on Sustainable Development.



February 2007
Executive Summary

CONFRONTING CLIMATE CHANGE:
AVOIDING THE UNMANAGEABLE AND MANAGING THE UNAVOIDABLE

Executive Summary. Scientific Expert Group Report on Climate Change and Sustainable Development. Prepared for the 15th Session of the Commission on Sustainable Development.

Global climate change, driven largely by the combustion of fossil fuels and by deforestation, is a growing threat to human well-being in developing and industrialized nations alike. Significant harm from climate change is already occurring, and further damages are a certainty. The challenge now is to keep climate change from becoming a catastrophe. There is still a good chance of succeeding in this, and of doing so by means that create economic opportunities that are greater than the costs and that advance rather than impede other societal goals. But seizing this chance requires an immediate and major acceleration of efforts on two fronts: mitigation measures (such as reductions in emissions of greenhouse gases and black soot) to prevent the degree of climate change from becoming unmanageable; and adaptation measures (such as building dikes and adjusting agricultural practices) to reduce the harm from climate change that proves unavoidable.

Avoiding the Unmanageable

Human activities have changed the climate of the Earth, with significant impacts on ecosystems and human society, and the pace of change is increasing. The global-average surface temperature is now about 0.8°C[1] above its level in 1750, with most of the increase having occurred in the 20th century and the most rapid rise occurring since 1970. Temperature changes over the continents have been greater than the global average and the changes over the continents at high latitudes have been greater still.

The pattern of the observed changes matches closely what climate science predicts from the buildup in the atmospheric concentrations of carbon dioxide (CO_2), methane (CH_4), and other greenhouse gases (GHGs), taking into account other known influences on the temperature. The largest of all of the human and natural influences on climate over the past 250 years has been the increase in the atmospheric CO_2 concentration resulting from deforestation and fossil-fuel burning. The CO_2 emissions in recent decades (Figure ES.1), which have been responsible for the largest part of this buildup, have come 75% to 85% from fossil fuels (largely in the industrialized countries) and 15% to 25% from deforestation and other land-cover change (largely from developing countries in the tropics).

1 A given temperature change in degrees Celsius (°C) can be converted into a change in degrees Fahrenheit (°F) by multiplying by 1.8. Thus, a change of 0.8°C corresponds to a change of 0.8 x 1.8 = 1.44°F.

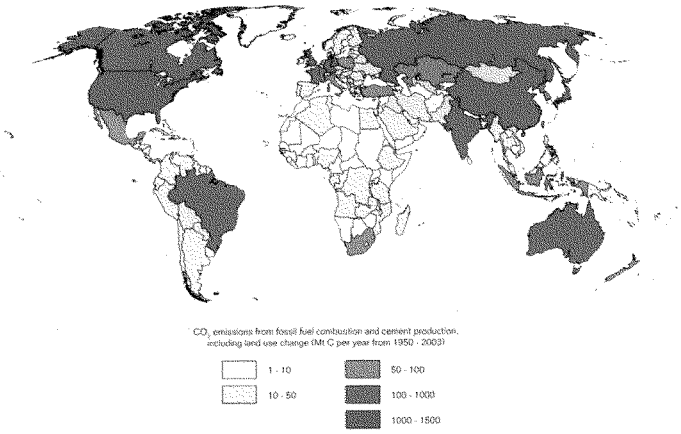


Figure ES.1. The annual emissions of CO_2 by country, averaged over the period 1950 to 2003, in millions of tonnes of carbon per year (MtC/year).

The seemingly modest changes in average temperature experienced over the 20th century have been accompanied by significant increases in the incidence of floods, droughts, heat waves, and wildfires, particularly since 1970. It now appears that the intensity of tropical storms has been increasing as well. There have also been large reductions in the extent of summer sea ice in the Arctic, large increases in summer melting on the Greenland Ice Sheet, signs of instability in the West Antarctic Ice Sheet, and movement in the geographic and altitudinal ranges of large numbers of plant and animal species.

Even if human emissions could be instantaneously stopped, the world would not escape further climatic change. The slow equilibration of the oceans with changes in atmospheric composition means that a further 0.4°C to 0.5°C rise in global-average surface temperature will take place as a result of the current atmospheric concentrations of greenhouse gases and particles.

If CO_2 emissions and concentrations grow according to mid-range projections, moreover, the global average surface temperature is expected to rise by 0.2°C to 0.4°C per decade throughout the 21st century and would continue to rise thereafter. The cumulative warming by 2100 would be approximately 3°C to 5°C over preindustrial conditions. Accumulating scientific evidence suggests that changes in the average temperature of this magnitude are likely to be associated with large and perhaps abrupt changes in climatic patterns that, far more than average temperature alone, will adversely impact agriculture, forestry, fisheries, the availability of fresh water, the geography of disease, the livability of human settlements, and more (see Figure ES.2). Even over the next decade, the growing impacts of climate change will make it difficult to meet the UN's Millennium Development Goals (MDGs).

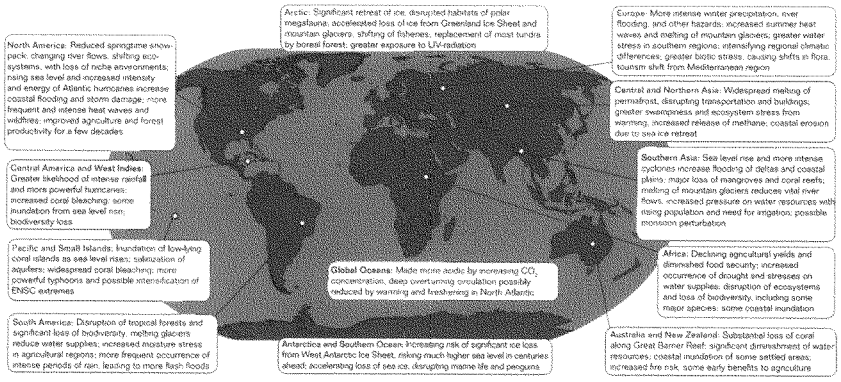


Figure ES.2. Significant impacts of climate change that will likely occur across the globe in the 21st century.

No one can yet say for certain what increase in global-average surface temperature above the 1750 value is "too much," in the sense that the consequences become truly unmanageable. In our judgment and that of a growing number of other analysts and groups, however, increases beyond 2°C to 2.5°C above the 1750 level will entail sharply rising risks of crossing a climate "tipping point" that could lead to intolerable impacts on human well-being, in spite of all feasible attempts at adaptation.

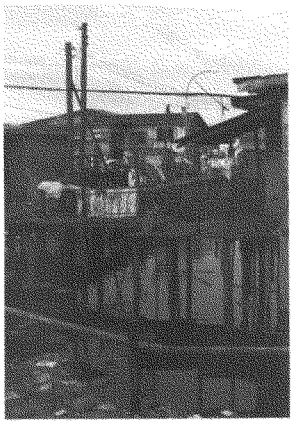
Ramping up mitigation efforts quickly enough to avoid an increase of 2°C to 2.5°C would not be easy. Doing so would require very rapid success in reducing emissions of CH_4 and black soot worldwide, and it would require that global CO_2 emissions level off by 2015 or 2020 at not much above their current amount, before beginning a decline to no more than a third of that level by 2100. (The stringency of this trajectory and the difficulty of getting onto it are consequences, above all, of the emission levels already attained, the long time scale for removal of CO_2 from the atmosphere by natural processes, and the long operating lifetimes of CO_2-emitting energy technologies that today are being deployed around the world at an increasing pace.)

But the challenge of halting climate change is one to which civilization must rise. Given what is currently known and suspected about how the impacts of climate change are likely to grow as the global-average surface temperature increases, we conclude that the goal of society's mitigation efforts should be to hold the increase to 2°C if possible and in no event more than 2.5°C.

Managing the Unavoidable

Even with greatly increased efforts to mitigate future changes in climate, the magnitude of local, regional, and global changes in climatic patterns experienced in the 21st century will be substantial.

- A 2°C increase in the global-average surface temperature above its 1750 value is likely, for example, to result in up to a 4°C warming in the middle of large continents and even larger increases in the polar regions. Regional changes will be even more extreme if global average temperatures rise by 3°C or higher.
- Climate change during the 21st century is likely to entail increased frequency and intensity of extreme weather, increases in sea level and the acidity of the oceans that will not be reversible for centuries to millennia, large-scale shifts in vegetation that cause major losses of sensitive plant and animal species, and significant shifts in the geographic ranges of disease vectors and pathogens.
- These changes have the potential to lead to large local-to-regional disruptions in ecosystems and to adverse impacts on food security, fresh water resources, human health, and settlements, resulting in increased loss of life and property.
- Some sectors in some locations may benefit from the initial changes in climate. Most impacts are expected to be negative, however, with the social and economic consequences disproportionately affecting the poorest nations, those in water-scarce regions, and vulnerable coastal communities in affluent countries.



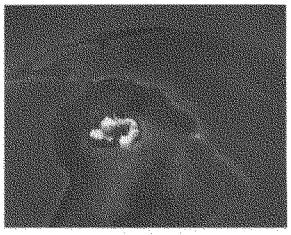
Managing the unavoidable changes in climate, both by promoting adaptation and by building capacity for recovery from extreme events, will be a challenge. International, national, and regional institutions are, in many senses, ill prepared to cope with current weather-related disasters, let alone potential problems such as an increasing number of refugees fleeing environmental damages spawned by climate change. Society will need to improve management of natural resources and preparedness/response strategies to cope with future climatic conditions that will be fundamentally different from those experienced for the last 100 years.

Integrating Adaptation and Mitigation to Achieve Multiple Benefits

The simultaneous tasks of starting to drastically reduce GHG emissions, continuing to adapt to intensifying climate change, and achieving the MDGs will require skillful planning and implementation, all the more so because of the interaction of these aims.

For example, clean and affordable energy supplies are essential for achieving the MDGs in the developing countries and for expanding and sustaining well-being in the developed ones. Energy's multiple roles in these issues provide "win-win" opportunities as well as challenges, including:

- Utilizing the most advanced building designs, which can provide emissions-free space conditioning (cooling and heating) in ways that greatly reduce energy and water demands and that promote improved health and worker performance.
- Implementing carbon capture and storage from fossil-fueled power plants, which reduce impacts on climate while making available concentrated CO_2 that can be used in enhanced natural gas and oil recovery and in agricultural applications.
- Replacing traditional uses of biomass fuels for cooking and heating (including agricultural residues and animal dung burned in inefficient cookstoves) with modern energy supplies that can reduce production of black soot and other aerosols, improve the health of women and children otherwise exposed to high indoor air pollution from traditional uses of biomass, and reduce deforestation and land degradation.
- Combining the sustainable use of biomass for energy (renewable sources of biomass to produce electricity, liquid fuels, and gaseous fuels) with carbon capture and sequestration, which can power development and remove CO_2 already emitted to the atmosphere.



In addition, reversing the unsustainable land-use practices that lead to deforestation and degradation of soil fertility will help limit the release of CO_2 and CH_4 into the atmosphere from the soil. Improving sanitation in rural areas can reduce emissions of CH_4 and provide a renewable fuel to help reduce dependence on coal, petroleum, and natural gas.

Projects and programs from around the world have demonstrated that much progress can be made on climate-change mitigation and adaptation in ways that save money rather than add to costs. Some of the measures that will ultimately be required are likely to have significant net costs – albeit much less, in all likelihood, than the climate-change damages averted – but a clear way forward for immediate application is to promote much wider adoption of "win-win" approaches, such as those described above, that reduce climate-change risks while saving money, or that produce immediate co-benefits outweighing the costs of the measures.

To move further, government leadership is required to establish policy frameworks that create incentives for energy-system change and establish public–private partnerships for energy-technology development, deployment, and diffusion. Leaders in the private sector also need to seize opportunities to develop, commercialize, and deploy low-emitting energy technologies that will also create jobs and enable economic development. Individuals, especially in affluent societies, must also show leadership by consuming responsibly.

The Elements of a Roadmap

Avoiding the unmanageable and managing the unavoidable will require an immediate and major acceleration of efforts to both mitigate and adapt to climate change. The following are our recommendations for immediate attention by the United Nations (UN) system and governments worldwide.

1. Accelerate implementation of win-win solutions that can moderate climate change while also moving the world toward a more sustainable future energy path and making progress on attaining the MDGs (see Box ES.1). Key steps must include measures to:

- Improve efficiency in the transportation sector through measures such as vehicle efficiency standards, fuel taxes, and registration fees/rebates that favor purchase of efficient and alternative fuel vehicles, government procurement standards, and expansion and strengthening of public transportation and regional planning.
- Improve the design and efficiency of commercial and residential buildings through building codes, standards for equipment and appliances, incentives for property developers and landlords to build and manage properties efficiently, and financing for energy-efficiency investments.
- Expand the use of biofuels, especially in the transportation sector, through energy portfolio standards and incentives to growers and consumers, with careful attention to environmental impacts, biodiversity concerns, and energy and water inputs.
- Promote reforestation, afforestation, and improved land-use practices in ways that enhance overall productivity and delivery of ecological services while simultaneously storing more carbon and reducing emissions of smoke and soot.
- Beginning immediately, design and deploy only coal-fired power plants that will be capable of cost-effective and environmentally sound retrofits for capture and sequestration of their carbon emissions.

Box ES.1. UN Millennium Development Goals

The eight Millennium Development Goals (MDGs) – which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015 – form a blueprint agreed to by all the world's countries and all the world's leading development institutions. The MDGs were adopted by heads of state meeting at the United Nations headquarters in September 2000. The goals are to:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

See http://www.un.org/millenniumgoals/index.html.

2. Implement a new global policy framework for mitigation that results in significant emissions reductions, spurs development and deployment of clean energy technologies, and allocates burdens and benefits fairly. Such a framework needs to be in place before the end of the Kyoto Protocol's first commitment period in 2012. Elements of the framework should include:

- An agreed goal of preventing a global-average temperature increase of more than 2°C to 2.5°C above the 1750 value – accompanied by multi-decade emission-reduction targets compatible with this aim.
- Metrics of performance that enable monitoring of progress towards reductions in energy and emissions intensity at a national level.
- Flexibility in the types of policies, measures, and approaches adopted that reflect different national levels of development, needs, and capabilities.
- Mechanisms that establish a price for carbon, such as taxes or "cap and trade" systems. A carbon price will help provide incentives to increase energy efficiency, encourage use of low-carbon energy-supply options, and stimulate research into alternative technologies. Markets for trading emission allocations will increase economic efficiency.
- A mechanism to finance incremental costs of more efficient and lower-emitting energy technologies in low-income countries.

3. Develop strategies to adapt to ongoing and future changes in climate by integrating the implications of climate change into resource management and infrastructure development, and by committing to help the poorest nations and most vulnerable communities cope with increasing climate-change damages. Taking serious action to protect people, communities, and essential natural systems will involve commitments to:

- Undertake detailed regional assessments to identify important vulnerabilities and establish priorities for increasing the adaptive capacity of communities, infrastructure, and economic activities. For example, governments should commit to incorporate adaptation into local Agenda 21 action plans and national sustainable-development strategies.
- Develop technologies and adaptive-management and disaster-mitigation strategies for water resources, coastal infrastructure, human health, agriculture, and ecosystems/biodiversity, which are expected to be challenged in virtually every region of the globe, and define a new category of "environmental refugee" to better anticipate support requirements for those fleeing environmental disasters.
- Avoid new development on coastal land that is less than one meter above present high tide, as well as within high-risk areas such as floodplains.
- Ensure that the effects of climate change are considered in the design of protected areas and efforts to maintain biodiversity.
- Enhance early-warning systems to provide improved prediction of weather extremes, especially to the most vulnerable countries and regions.

- Bolster existing financial mechanisms (such as the Global Environment Facility) – and create additional ones – for helping the most vulnerable countries cope with unavoidable impacts, possibly using revenues generated from carbon pricing, as planned in the Adaptation Fund of the Clean Development Mechanism.
- Strengthen adaptation-relevant institutions and build capacity to respond to climate change at both national and international levels. The UN Commission on Sustainable Development (CSD) should request that the UN system evaluate the adequacy of, and improve coordination among, existing organizations such as the CSD, the Framework Convention on Climate Change, the World Health Organization, the Food and Agriculture Organization, the UN Refugee Agency, the World Bank, and others to more effectively support achievement of the MDGs and adaptation to climate change.

4. Create and rebuild cities to be climate resilient and GHG-friendly, taking advantage of the most advanced technologies and approaches for using land, fresh water, and marine, terrestrial, and energy resources. Crucial action items include the following elements:

- Modernize cities and plan land-use and transportation systems, including greater use of public transit, to reduce energy use and GHG intensity and increase the quality of life and economic success of a region's inhabitants.
- Construct all new buildings using designs appropriate to local climate.
- Upgrade existing buildings to reduce energy demand and slow the need for additional power generation.
- Promote lifestyles, adaptations, and choices that require less energy and demand for non-renewable resources.

5. Increase investments and cooperation in energy-technology innovation to develop the new systems and practices that are needed to avoid the most damaging consequences of climate change. Current levels of public and private investment in energy technology research, development, demonstration, and pre-commercial deployment are not even close to commensurate with the size of the challenge and the extent of the opportunities. We recommend that national governments and the UN system:

- Advocate and achieve a tripling to quadrupling of global public and private investments in energy-technology research, emphasizing energy efficiency in transportation, buildings, and the industrial sector; biofuels, solar, wind, and other renewable technologies; and advanced technologies for carbon capture and sequestration.
- Promote a comparable increase in public and private investments – with particular emphasis on public–private partnerships – focused on demonstration and accelerated commercial deployment of energy technologies with large mitigation benefits.
- Use UN institutions and other specialized organizations to promote public–private partnerships that increase private-sector financing for energy-efficiency and renewable-energy investments, drawing upon limited public resources to provide loan guarantees and interest rate buy-downs.
- Increase energy-technology research, development, and demonstration across the developing regions of the world. Potential options for achieving this goal include twinning arrangements between developed and developing countries and strengthening the network of regional centers for energy-technology research.
- Over the next two years, complete a study on how to better plan, finance, and deploy climate-friendly energy technologies using the resources of UN and other international agencies such as the UN Development Programme, the World Bank, and the Global Environment Facility.

6. Improve communication to accelerate adaptation and mitigation by increasing education efforts and creating forums for dialogue, technology assessment, and planning. The full range of public- and private-sector participants should be engaged to encourage partnerships across industrial and academic experts, the financial community, and public and private organizations. National governments and the UN system should take the following steps:

- Develop an international process to assess technologies and refine sectoral targets for mitigation that brings together experts from industry, nongovernmental organizations, the financial community, and government. The Technology and Economic Assessment Panel of the Montreal Protocol provides an effective model for assessing technological potential and effective, realistic sectoral mitigation targets.
- Enhance national programs for public and corporate education on the needs, paths, opportunities, and benefits of a transition to a low-emission energy future.
- Enlist the educational and capacity-building capabilities of UN institutions to provide information about climate change and the opportunities for adaptation and mitigation. Under the leadership of the Department of Economic and Social Affairs, the UN should complete an internal study to more effectively engage relevant UN agencies.

The Time for Collective Action is Now

Governments, corporations, and individuals must act now to forge a new path to a sustainable future with a stable climate and a robust environment. There are many opportunities for taking effective early action at little or no cost. Many of these opportunities also have other environmental or societal benefits. Even if some of the subsequent steps required are more difficult and expensive, their costs are virtually certain to be smaller than the costs of the climate-change damages these measures would avert.

Two starkly different futures diverge from this time forward. Society's current path leads to increasingly serious climate-change impacts, including potentially catastrophic changes in climate that will compromise efforts to achieve development objectives where there is poverty and will threaten standards of living where there is affluence. The other path leads to a transformation in the way society generates and uses energy as well as to improvements in management of the world's soils and forests. This path will reduce dangerous emissions, create economic opportunity, help to reduce global poverty, reduce degradation of and carbon emissions from ecosystems, and contribute to the sustainability of productive economies capable of meeting the needs of the world's growing population.

Humanity must act collectively and urgently to change course through leadership at all levels of society. There is no more time for delay.

UNITED NATIONS-SIGMA XI SCIENTIFIC EXPERT GROUP ON CLIMATE CHANGE

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Diana Ürge-Vorsatz, Professor, Central European University, Hungary

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James Edmonds, Senior Staff Scientist, Joint Global Change Research Institute at University of Maryland College Park, United States

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Nathan L. Engle, School of Natural Resources and Environment, University of Michigan, United States

Reviewers at the AAAS Annual Meeting, 2006

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Sally Benson, Lawrence Berkeley National Laboratory, United States

Norm Christensen, Duke University, United States

William Clark, Harvard University, United States

Robert Corell, The Heinz Center, United States

Gladys Cotter, US Geological Survey, United States

Partha Dasgupta, University of Cambridge, United Kingdom

Geoff Hawtin, Global Crop Diversity Trust, United Kingdom

Daniel Kammen, University of California, Berkeley, United States

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Senator BOXER. We are going to continue now, we are going to try to stick with the 5-minute opening statement. I am going to call on Senator Lautenberg for his opening statement, and then Senator, you can speak about your Governor now or you can wait until we have all statements made and you can then introduce him at that time.

Senator LAUTENBERG. Can I do it without charge to my timeframe?

Senator BOXER. Yes.

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

Senator LAUTENBERG. First, I want to thank Senator Inhofe for his encouraging view of our intentions to reduce greenhouse gas, thank you very much.

[Laughter.]

Senator LAUTENBERG. Madam Chairman, before I introduce Governor Corzine, I just want to say that States are leading when it comes to combating global warming. Now the Federal Government needs to catch up. Our witnesses hail from States with innovative and active programs to cut greenhouse gases and control climate change.

In addition to Governor Corzine's initiatives to cut emissions within our State, New Jersey has also joined six eastern States to launch their Regional Greenhouse Gas Initiative, which will help curb emissions from powerplants.

Thirty-six of New Jersey's cities have joined nearly 400 other cities from across the Country to do what the Bush administration won't do, and that is meet or beat the Kyoto Protocols. New Jersey and other States are beginning to weave a web of smart environmental regulations across the Country. But the Federal Government is not doing its part to strengthen that web. We can change that.

I strongly support Senator Sanders' Global Warming Pollution Reduction Act, which calls for an 80 percent cut in global warming pollutants by 2050. If we don't take the steps now, we will continue to threaten succeeding populations, including my grandchildren's grandchildren. It is not something I am willing to throw away.

I have also been joined by Senator Boxer and Senator Snowe in introducing the High Performance Green Buildings Act. Buildings, from apartments to skyscrapers, account for nearly 40 percent of our greenhouse gases. The Federal Government is the biggest landlord in the Country. By getting Federal buildings to go green, we can put a significant dent in our emissions.

But the Federal Government needs to do more. We need caps on greenhouse gas emissions from all powerplants and other facilities that produce pollution. We need to increase cap-based standards to get vehicle emissions and dependence on foreign oil down. We need incentives for cities and businesses to build in ways that are better for the environment.

We have to end the censorship and suppression of Government scientists who do research on global warming. The public is taking better care of our environment and they want to do more. People are buying hybrids, cars based on fuel efficiency, for example. Some

in the private sector are also taking some positive steps, the CEOs from some of America's largest companies, like General Electric and DuPont are now calling for Federal legislation to reduce greenhouse gases. So it is time for the Federal Government to step up, do its part and support our States, cities and towns that are already doing theirs.

[The prepared statement of Senator Lautenberg follows:]

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

Madame Chairman, thank you for holding today's hearing on how the States are leading when it comes to combating global warming—and how the Federal Government needs to catch up.

Among today's witnesses is my Governor, Jon Corzine. Our witnesses hail from States with innovative and active programs to cut greenhouse gases and control climate change.

In addition to Governor Corzine's move to cut emissions within our state, New Jersey has also joined six eastern States to launch the Regional Greenhouse Gas Initiative, which will help curb emissions from powerplants.

And 36 of New Jersey's cities have joined nearly 400 other cities from across America to do what the Bush administration won't do: meet or beat the Kyoto Protocols.

New Jersey and other States are beginning to weave a web of smart environmental regulations across the country. But the Federal Government is not doing its part to strengthen that web.

We can change that.

That is why I strongly support Senator Sanders' 'Global Warming Pollution Reduction Act,' which calls for an 80 percent cut in global warming pollutants by 2050.

I have also been joined by Senators Snowe and Boxer in introducing the 'High Performance Green Buildings Act.'

Buildings—from apartments to skyscrapers—account for nearly 40 percent of our greenhouse gases. The Federal Government is the biggest landlord in the country and by getting Federal buildings to "go green," we can put a significant dent in our emissions.

But the Federal Government needs to do more.

We need caps on greenhouse gas emissions from all powerplants and other facilities that pollute.

We need to increase CAFÉ standards to get vehicle emissions and dependence on foreign oil down.

We need incentives for cities and businesses to build in ways that are better for the environment.

And we must end the censorship and suppression of government scientists who do research on global warming.

The public is taking better care of our environment—and they want to do more. People are buying hybrids and cars based on fuel efficiency, for example.

Some in the private sector are also taking some positive steps.

The CEO's from some of America's largest companies, such as General Electric and DuPont, and now calling for Federal legislation to reduce greenhouse gases.

It's time for the Federal Government to do its part—and to support our States, cities and towns that are already doing theirs.

Senator LAUTENBERG. Madam Chairman, if I might just say a few words about Governor Corzine, no stranger to Capitol Hill. The Governor and I used to be Senate colleagues. Both of us initiated a job change, and I hope he enjoys as much as I do mine. Now I am one of his constituents, he is one of mine. New Jersey is proud of our Governor, because he is willing to step up and do the right thing, even if it looks at the moment like it is putting more pressure on us. But someone has to take a longer view, and Governor Jon Corzine is willing to do that. We see it in his leadership here to fight the fight against global warming.

I am proud of New Jersey today, because New Jersey is among a small group of States that is leading the Nation when it comes

to reducing global warming. Two weeks ago, Governor Corzine signed an order to reduce New Jersey's total emissions from cars, buildings and factories alike by 80 percent by 2050. New Jersey and California are two of just a few States to take such action.

So I am happy to see Jon Corzine here, back in his familiar surroundings. But New Jersey needs him, so we will try not to keep him here too long, and let the Federal Government do what it needs to do. Please welcome Jon Corzine.

Governor CORZINE. Thank you.

Senator BOXER. Thank you very much, and we will go to Senator Voinovich. Welcome, Senator.

STATEMENT OF HON. GEORGE V. VOINOVICH, U.S. SENATOR FROM THE STATE OF OHIO

Senator VOINOVICH. Madam Chairman, I thank you for holding this hearing today and I am glad that we have State and local perspectives on global warming. I have often said this is a difficult and controversial topic, with some declaring it a hoax and some declaring that the end of the world is near. I share neither of these beliefs, and it is going to be really nice that we are having local government officials, State officials. Because ordinarily, this is about maybe the 12th hearing I have had in 8 years. Senator Corzine, you will remember that some of the hearings we have had, at the end they started out, the witnesses being very nice to each other, and at the end I thought we had to stop them from going after each other. I am sure that we are not going to have that today, Madam Chairman, with our State and local government officials.

The reality is that not all global warming skeptics are denialists or idealogues. Those in the environmental movement are not all alarmists. We can learn a lot and achieve more if we listen a little more to each other, and I suspect that is what Americans believe and they expect, they expect us to work together.

I do believe that global warming is something that will need to be addressed, and I look forward to hearing from the witnesses today. I am particularly happy that an Ohioan has been asked to testify, Mayor Richard Homrighausen, from Dover, OH. As a former mayor and Governor, I can relate to the problems cities and States face with respect to balancing both environmental and economic needs. Mayor, you have to deal with it every day. I have long advocated the need to harmonize our environment, energy and economic needs. I hope this hearing today helps us better understand how States are trying to achieve these goals.

For the past 2 years, I have called for a second declaration of independence: independence from foreign sources of energy. For our Nation to take real action toward stemming our exorbitantly high oil and natural gas prices, instead of considering them separately, we must harmonize our environment and energy and economic needs. This is an absolute must as we consider any additional actions to address climate change. From my own humble opinion, I agree with much of what Senator Inhofe has had to say, too often we just don't get our energy, economic and environmental people to sit down together. In fact, the problem we have had for the last 8 years and why we haven't made any progress is because we can't

get them together to put each others' shoes on and come up with something that makes sense.

I think we also have to become well aware of the fact that what we do is also going to be impacted dramatically by the developing countries. For example, we know that China is building a new coal-fired plant every week to 10 days, and many of them lack modern pollution control devices. Those of you from California are already feeling the effects of what is going on in China.

This is a worldwide problem. We have to realize that we have a role to play, but we also must recognize that others have a role to play. The more we can engage them in this debate the better off we are going to be, and so is the world. I think that as a result, and some of you may not be familiar with this, as a result of legislation we passed last year, we now have an international initiative that is called the Asian Pacific Partnership. It involves Australia, China, India, Japan, South Korea and the United States. These are developing countries, many of them, and what we are trying to do is come up with technology that will not only benefit us but benefit the world.

We just can't say we are going to deal with this in the United States. We have to understand this is a global problem and that by 2009, the Chinese are going to exceed our emissions here in the United States. We were the bad guy for a long time. But these other developing nations are coming along and we have to be just as concerned about them as we are ourselves.

I would like to reiterate that I believe that global warming is occurring. The ongoing debate is over how much is due to natural causes and man-made causes. The issue is what do we do from a responsible public policy perspective to deal with the problem. It is something I hope this committee can work together on to develop responsible global warming policies that ultimately harmonize our energy, environment and economic needs.

I want to point out one other thing, Madam Chairman, that the technology, particularly to deal with emissions from coal-fired plants, is still in its infancy. The only real major thing that this Government has done is FutureGen, and that won't be built for the next 2 to 3 years. We ought to have a crash program of getting into that kind of research, so that we have these coal-fired plants that are out there, so they can retrofit, have the technology to retrofit them, make sure that the new plants that are being built deal with greenhouse gases responsibly.

I know that some of the States represented here really don't care about it, because you get very little energy from coal. But the fact is, it is a reality. The United States is the Saudi Arabia of coal. Coal is going to be a part of our energy fix for a long, long time. Some of you from environmental group say, well, we don't want any coal. The fact of the matter is we are going to have coal. We had better get with it as soon as we possibly can to deal with technology that is going to limit those greenhouse emissions from those coal-fired facilities.

Thank you, Madam Chairman.

Senator BOXER. Thank you, Senator. I agree with your comments on coal. I think we are going to absolutely need to find a solution, because we have 250 years worth of it. It makes sense.

Senator Klobuchar.

STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM THE STATE OF MINNESOTA

Senator KLOBUCHAR. Thank you, Madam Chair, and thank you, Governor. Welcome. It is my belief that we have seen a major sea change this year with our committee focused not just on whether or not there is global warming, but clearly we are focused on the solutions. A big part of this is going to be the innovative efforts going on in the States across this Country.

Think globally, act locally used to be a bumper sticker, and now it is a necessity. I can tell you that in my State, we are not content to just sit around and wait for things to happen. We have seen how long it has been taking to get the fishhouses out on the lakes. We have seen the effects that it has had for some of our hunters and activities. While we believe the scientists and we believe in science, we are actually seeing first-hand the effects of climate change in our State.

Today's hearing is especially timely for local people in Minnesota. Just last week we passed a new law that is now considered the Nation's most aggressive standard for promoting renewable energy in electricity production. It is a 25-by-25 standard. By the year 2025, the State's energy companies are required to generate 25 percent of their electricity from renewable sources, such as wind, solar, water and biomass.

The standard is even higher for Minnesota's largest utility, Excel Energy, which must reach 30 percent by 2020. Excel, which supplies half the electricity in Minnesota, has said that it expects to meet the new standard without a price increase for consumers. Already, it has announced that it will build a $210 million wind farm in Minnesota.

Almost as important as the renewable energy standard itself is the bipartisan political energy that produced the new law. It was adopted with overwhelming bipartisan support, the vote was 123 to 10 in the State House and 61 to 4 in the State Senate. It was quickly signed into law by Republican Governor Tim Pawlenty.

The same thing is happening at the local level. I just went across our State, and talking about middle-class tax cuts and the Farm bill. Every place I went, people were bringing up climate change. I was in the little town of Lanesboro, MN, in a high school gym, Madam Chair, and all they wanted to talk about is the new light bulbs that their city council had ordered them to put up. They were very excited about their own efforts on the local level.

That is what we are seeing across this Country, with the work in New Jersey, with the work just recently announced in the five western States and the work that is going on in California. I admire the States and communities for their initiative, and what they are doing should inspire national action. With all of these many efforts and initiatives at the local, State and regional levels, I ask, how many bills has Congress passed to actually limit the greenhouse gases that contribute to global warming and climate change? Right now, the answer is zero. My hope is that we will be able to change that number sooner rather than later.

We are all students of government, so we know the famous phrase, laboratories of democracy. That is how Supreme Court Justice Louis Brandeis described the special role of States in our Federal system. "It is one of the happy incidents of the Federal system," Brandeis wrote over 70 years ago, "that a single, courageous State may, if its citizens choose, serve as a laboratory and try novel social and economic experiments without risk to the rest of the Country."

But Brandeis did not mean for this to serve as an excuse for inaction by the national Government. Good ideas and successful innovations are supposed to emerge from the laboratory and serve as a model for national policy and action. That is now our responsibility. The courage we are seeing in the States as they deal with global warming should be matched by courage right here in Washington. We should be prepared to act on a national level, especially when the local and State communities are showing us the way.

In this spirit, I look froward to our discussion today.

[The prepared statement of Senator Klobuchar follows:]

STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM THE STATE OF MINNESOTA

I look forward to today's discussion of local, State and regional perspectives on global warming and climate change.

Some observers have suggested that public attitudes on global warming may soon reach a "tipping point" that will spur sweeping changes in our society.

Already, many of the most innovative efforts are coming at the local, State and regional levels.

Think globally, act locally" used to be a bumper sticker. Now it's a necessity.

I can tell you that, in my state of Minnesota, people are growing ever more concerned. Minnesotans love being out in nature. This winter I have heard from ice fishermen, snowmobilers and cross-cross skiers who tell me they personally see the signs of global warming and climate change:

In our State, when we see something that concerns us, we're not content to sit around. We want to do something to make a difference. We want to take action.

Today's hearing is especially timely.

Just last week, Minnesota passed a new law that is now considered the Nation's most aggressive standard for promoting renewable energy in electricity production.

It's a "25-by-25" standard. By the year 2025, the State's energy companies are required to generate 25 percent of their electricity from renewable sources such as wind, water, solar and biomass. The standard is even higher for Minnesota's largest utility, Xcel Energy, which must reach 30 percent by 2020.

Xcel, which supplies half the electricity in Minnesota, has said that it expects to meet the new standard without a price increase for consumers. Already, it has announced that it will build a $210 million, 100-megawatt wind farm in Minnesota.

Almost as important as the renewable energy standard itself is the bipartisan political energy that produced this new law.

It was adopted with overwhelming bipartisan support. The vote was 123 to 10 in the State House, and 61 to 4 in the State Senate. It was quickly signed into law by Republican Governor Tim Pawlenty.

This new law is further demonstration that elected officials and policymakers across the spectrum understand what's at stake.

The same thing is happening at the local level. St. Paul, our capital city, has implemented a creative and forward-thinking Urban CO_2 Reduction Plan to reduce its carbon footprint.

It's not only about combating global warming and climate change. It's also about reducing pollution and improving air quality. It's about promoting economic development and technological innovation. And it's about ensuring our future energy independence and security.

We are seeing other major climate change initiatives elsewhere in the country.

Earlier this week, governors from five Western States (including California and Arizona) announced that they will work together to reduce greenhouse gases by setting regional targets for lower emissions and establishing a regional "cap-and-trade" system for buying and selling greenhouse gas credits.

This new regional project builds on the greenhouse gas emissions measure that the California legislature passed and California Governor Schwarzenegger signed into law last year.

And it builds on other regional initiatives—especially the landmark Regional Greenhouse Gas Initiative with seven northeastern and mid-Atlantic States that have also agreed to a regional "cap-and-trade" system aimed at reducing carbon dioxide emissions.

One of the States in that initiative is New Jersey. I am pleased to see Governor Corzine with us today. I look forward to hearing more about the executive order he signed last month setting a State economy-wide goal for reducing greenhouse gas emissions.

I also look forward to hearing from Seattle Mayor Greg Nickels, who has led the way with the U.S. Mayors Climate Protection Agreement. More than 400 mayors (representing over 59 million Americans) have pledged to meet or beat the Kyoto Protocol greenhouse gas reduction goals in their own communities.

I admire these States and communities for their initiative. And what they're doing should be an inspiration for national action.

With all of these many efforts and initiatives at the local, State and regional levels, how many bills has Congress passed to actually limit the greenhouse gases that contribute to global warming and climate change?

Right now, the answer is zero. My hope is that we will be able to change that number—sooner rather than later.

As Arizona Governor Janet Napolitano explained the other day: "In the absence of meaningful Federal action, it has been up to the States to take action to address climate change and reduce greenhouse gas emissions in the country."

We are all students of government. So we know the famous phrase "laboratories of democracy." That's how Supreme Court Justice Louis Brandeis described the special role of States in our Federal system.

In this model, States are where new ideas can emerge . . . where policymakers can experiment . . . where innovative proposals can be tested.

"It is one of the happy incidents of the federal system," Brandeis wrote over 70 years ago, "that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."

But he did not mean for this to serve as an excuse for inaction by the national government. Good ideas and successful innovations are supposed to emerge from the laboratory and serve as a model for national policy and action. That is now our responsibility.

The courage we're seeing in the States as they deal with global warming should be matched by courage right here in Washington. We should be prepared to act on a national level—especially when the States and local communities are showing us the way.

In this spirit, I look forward to our discussion today.

Senator BOXER. Thank you very much, Senator.

Senator Thomas.

STATEMENT OF HON. CRAIG THOMAS, U.S. SENATOR FROM THE STATE OF WYOMING

Senator THOMAS. Thank you, Madam Chairman. I will be short. I think it might kind of nice to listen to the witnesses that we have today.

I thank you for having this hearing, however, and I believe hearing from the regional and about the regional impacts is very, very important. I am very concerned about having an energy mix. I believe we have to have an understanding of how important it is to deal with our resources as we look forward here, of course, as there has already been some discussion about coal. As you might imagine, I have a strong feeling about that.

But we need to make sure what we do here doesn't injure our national economy. So I will file my report. I would tell you that we don't produce enough gas to provide for our energy. We have coal, as has been pointed out here, for about 200 years worth of energy.

So our real challenge is how do we use the resources we have in an environmentally clean way and an efficient way to be able to do that. That is really where we are.

So I will submit my statement. Thank you.

[The prepared statement of Senator Thomas follows:]

STATEMENT OF HON. CRAIG THOMAS, U.S. SENATOR FROM THE STATE OF WYOMING

First, I'd like to thank the Chair for convening this hearing. I believe that the regional impacts of greenhouse gas reductions are the most important part of the climate change debate. I would have liked to hear from a witness that is as concerned about the role that coal plays in our economy and energy mix as I am. I believe several witnesses have a rational understanding of how important this resource is, however.

I will repeat what we're all very used to hearing at this point. It is extremely important that any actions taken by the Federal Government do not harm our economy or our national energy security. I fear that extreme measures proposed by some will, in fact, cause this to happen. As an example, compliance with some proposals would require a shift to more natural gas. We can't produce all of that natural gas here in the United States. We're trying to help in Wyoming but it's not enough, and folks are growing tired of the breakneck pace of development in my State. Unless our coastal States begin to share more of this production burden, we will be in a very difficult situation.

What we'll end up needing to do, of course, is building liquefied natural gas terminals in coastal States like New Jersey to import what we cannot produce here at home. The gas we'll import will come from countries like Iran and Russia. The leaders of these countries have already started talking about forming a cartel, like OPEC, for natural gas exports.

I'd like to hear from Governor Corzine about what he thinks of liquefied natural gas terminals and drilling offshore. My guess is that he doesn't support either one. I support drilling off our coasts, but I am opposed to importing natural gas. We already depend on foreign countries for oil to run our transport sector. I do not want to become reliant on these same volatile regions to generate our electricity. That would harm our national security.

What do we do about this problem then? Well, we have 200 years worth of energy sitting 60 feet underground in the Powder River Basin of Wyoming in the form of coal. What we need to do is advance clean coal technologies so this domestic resource can be used in a more efficient and environmental way.

Another one we hear a lot about is that greenhouse gas emissions are an international problem. I agree. China is putting a coal powerplant into service every 10 days and India is growing just as fast. These countries will rely heavily on coal as their economies develop—that is a fact. Everyone, though, must understand that a liquefied natural gas terminal on our coast does nothing to reduce the emissions of China and India. Advancing clean coal technologies and sharing them internationally does a lot of good, however.

Wyoming's perspective is one of a State that is willing to help, but we need to have a rational conversation about the best way to do these things. I hope that effort can begin today. I thank the witnesses for being here today.

Senator BOXER. Thank you so much, Senator.

Senator Sanders, welcome.

STATEMENT OF HON. BERNARD SANDERS, U.S. SENATOR FROM THE STATE OF VERMONT

Senator SANDERS. Thank you very much, Madam Chair, and then you for holding this important hearing.

Let me be very clear. There are some people who say, well, we shouldn't be alarmists. Madam Chair, I am an alarmist. I think that the debate is over. I think global warming is real. I think global warming is man-made. I think if we as a Nation and as a planet do not get our act together, we are looking at disasters to come for our kids and our grandchildren. There are some people who say, well, gee, if we act too strongly, and you and I have proposed some

very strong legislation, if we act very aggressively on global warming, it will have a negative impact on the economy.

Let me tell you, if we do not act aggressively on global warming, the impact on the economy will be far, far more severe. I believe, there is no question in my mind that the Congress has been much, much too slow in moving forward and I hope this year we will change that pattern. To my mind, what this Country has to do is move toward a new Manhattan-type project. We moved aggressively on World War II, President Kennedy moved us forward in getting a man to the moon. Now is the time for a partnership between Government and the private sector to in fact say, we are going to break our dependency on fossil fuels, we are going to move toward energy efficiency and we can do that. The technologies are out there. What has been lacking for many years is the political will. I hope that that will be changed right now.

I happen to believe that if we move forward in that direction we can create millions of good paying jobs, as we save the planet for our kids and our grandchildren.

Now, in fact, while the Federal Government has not been aggressive, while we have a President who virtually refuses to acknowledge the reality of global warming, the truth is that cities and towns and States have been moving forward. As Senator Klobuchar mentioned, one of the beauties of our system is that if Minnesota moves forward or Vermont moves forward, the rest of the Country learns from that process. So I have been impressed by what States are doing. I have been impressed by what municipalities have been doing and I very much look forward to hearing the testimony today, so that we as a Federal Government can learn best practices.

Thank you, Madam Chair.

Senator BOXER. Thank you very much.

Senator Bond.

STATEMENT OF HON. CHRISTOPHER S. BOND, U.S. SENATOR FROM THE STATE OF MISSOURI

Senator BOND. Thank you very much, Madam Chair. It is always a pleasure to be able to join with you in these continuing discussions of global warming. I know this committee has other responsibilities, but we are having lots of opportunities and I thank you for holding this hearing to get the important impact from the States.

One of the things I think we are going to learn today is that some of the current climate change proposals have the ability to hurt certain regions more than others. I think we have to account for the differences among the areas of the Country to ensure that actions we require are fair and affordable to all of our families and workers.

There is an old principle, where you stand depends upon where you sit. That applies across bipartisan lines as well. The chart here, this chart shows why carbon plans will hit States differently. These pie charts show how different States derive their electricity from different fuel sources.

Now, Missouri, we depend upon coal for 85 percent of our power. New Jersey depends upon coal only 20 percent, and California only

1 percent. So coal cost don't have an impact in California, much less in New Jersey. But these climate plans that hit coal hard will cause real economic distress, relatively speaking, States already emphasizing lower carbon energy with natural gas or nuclear are not going to be hit so badly.

There are some economic consequences, Madam Chair. You have to have a strong economy to be able to afford environmental improvements. The strength of the American economy has allowed us to do a better job in controlling greenhouse gas emissions than our European Union friends who so loudly proclaimed their love for Kyoto but have not been able to cut the mustard. Keeping the economy strong will allow us to make more gains in dealing with environmental problems.

I saw first-hand, Madam Chair, the environmental disaster of socialist East Germany. I went there just after the wall fell. I saw chemical plants with terrible smells putting fluid, liquid into open creeks, flowing into the sea. It looked like very dark coffee. But it smelled like something that I won't describe, because we are too close to lunch time to describe it. Getting the East German economy revived, West Germany with its strong economy, is the only way that we can make that progress.

But there is also another problem. Putting heavy costs on coal can have major unintended consequences. I hope they are unintended. But the more you put pressure on coal, the less resources will be available to develop the clean coal technology that we must have. On the regional basis, plans that place an unfair degree of pain on midwestern families and workers would include caps set too low or too soon, lack of safety valves or requiring auctions that force consumers to pay twice for their energy, once when it is produced and again through the auction process.

Now, the witnesses here today from New Jersey espouse this, just the same sort of anti-coal bias. Indeed, it is easy to determine who are for the plans that are unfair and unaffordable by many looking at this chart. Here are the States in the tan, our States that depend upon coal. The States not so colored are the ones, like the northeast and the west coast that don't depend upon coal. No wonder the people who are champions of carbon caps come from the white colored States. We in the Midwest don't intend to stand by and see it happen.

I would say in my remaining seconds that one of the things that we have to do is wean the greedy natural-gas burning electric utilities off of that valuable resource. I have quoted before, but maybe somebody hasn't heard it, 25 years ago, Professor Glenn Seaborg, a Nobel laureate, said burning natural gas to produce electricity is like throwing your most valuable antique furniture into the fireplace to heat your house.

Madam Chair, I have lots more, but I see my time is up, and I thank you.

Senator BOXER. Senator Bond, it is really great to have you here, because you really are very animated on this. I just want to repeat, there seems to be an argument, I personally believe clean coal technology is absolutely essential. We have to deal with it, and I am very open to it and want to do it.

I also wanted to mention, to get 20 percent of your power from coal is a lot of energy. So I do think we will look forward to hearing Senator Corzine on that.

Senator Clinton.

STATEMENT OF HON. HILLARY RODHAM CLINTON, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator CLINTON. Thank you, Madam Chairman. I could not disagree more with Senator Bond's description of the problems we face. We have heard an eloquent, passionate description of why we can't do anything. I reject that. I think that we can do whatever we put our minds to. We just haven't been willing to do that in the last several years.

So I commend the Chairman, because she is willing to lead us on a path that will not only be good for the environment, it will be good for the economy and it will be good for our security. On Monday, I was at a coal-fired plant outside of Buffalo, NY, that is looking to be one of the very first in our Country to move toward an integrated gasifcation system. It is going to take some help in order for them to do that. We have subsidized the oil and gas industry for decades. It is time to take those subsidies, those tax breaks, and put them to work on behalf of clean coal and renewables. I hope that we can address that. I have a proposal to do that with a strategic energy fund that would get us on the right path for deploying new technologies in a way that will begin to let us seriously deal with climate change.

I am delighted to see our former member of this committee here. If we ever stop talking, he will have a chance to testify. Governor Corzine and I shared a great, great time on this committee early on trying to deal with some of the consequences of the attacks of 9/11. He was the strongest voice with the best plan on dealing with chemical plants. He is back again to talk about more of his far-reaching ideas that will really make a difference.

I notice, too, that there are representatives from California, both the President pro tem of the California State Senate, and the Speaker of the California State Assembly. Because it is interesting to note that when people talk about how we cannot deal with climate change without wrecking our economy, California has had a flat per capita usage of electricity for 30 years. Why? Because California took steps to try to reduce demand, to do more energy efficiency and conservation. The rest of the Country has had an increase in 50 percent of the use of electricity on a per capita basis.

So when people say we can't do this, I say, "well, I don't think that is true." In fact, California is doing it.

There are a lot of good ideas that are at work right now across our Country. I commend the Chairman for giving us this opportunity to learn more about what is actually working in the States. It is our challenge to take it to scale, to put into place a framework for a national program. That is what we are going to do under your leadership, and again, I thank you for leading the way.

Senator BOXER. Thank you so much, Senator Clinton.

Senator Craig.

STATEMENT OF HON. LARRY E. CRAIG, U.S. SENATOR FROM THE STATE OF IDAHO

Senator CRAIG. Madam Chairman, I came late, and I apologize. So because of the patience of our former colleague here and his presence before the committee today, I say let the show begin.

Senator BOXER. Well, the show began a long time ago.

[Laughter.]

Senator CRAIG. So I noticed.

Senator BOXER. But you are most generous of spirit and we thank you.

Just to delay it a tad more, I have asked Senator Menendez, because he felt so strongly about saying a few words, as Senator Lautenberg did, about his Governor. Senator?

Senator MENENDEZ. Thank you, Madam Chairlady, and thank you and Senator Inhofe for the opportunity to join in the honor and privilege of introducing my predecessor here in the Senate and our Governor Jon Corzine to the committee. In the years since Governor Corzine has taken office, he has exhibited tremendous leadership on a broad array of policy issues, taken on some of the toughest issues in our State. He has demonstrated a steadfast determination to work to improve the quality of life for all New Jerseyians.

One of the areas that I am proud to say that he is leading New Jersey into excellence in is his stewardship of the environment, to a commitment of making the tough decisions that need to be made in order to ensure that our children and grandchildren are left with a healthier world than the one we are living in today. I think our Governor knows the tremendous risk that our State, our Nation and our planet face if we do not take serious action to combat global warming and that we do not do so sooner rather than later.

But he also has the foresight to recognize the tremendous opportunities that New Jersey can take advantage of quickly and decisively, the advantage that the Nation as a whole could enjoy relative to the rest of the world if we, as Congress, act similarly. Now, having some of our colleagues' comments, I would say that what is not acceptable is to put any part of the Nation to put our collective health, security and well-being at risk. We are all in this together. I think that when we come to that conclusion we will all be able to move forward in a way that will achieve our collective goals.

Individual actions to reduce greenhouse gases, either by making your home more energy efficient or purchasing carbon offsets are good starts, as are State and regional actions like the Regional Greenhouse Gas Initiative and the Western Regional Climate Action Initiative. But they are no substitute for a robust national climate policy.

So I want to applaud Governor Corzine for his steps in New Jersey, making New Jersey one of the leaders on this issue. I applaud your leadership, Madam Chairlady, and the committee, for making this one of the highest priorities of the new Congress. Again, thank you for the opportunity to introduce our Governor and my good friend, Jon Corzine.

STATEMENT OF HON. JON S. CORZINE, GOVERNOR, STATE OF NEW JERSEY

Governor CORZINE. Thank you, Madam Chairman, and I appreciate very much the kind words of Senator Menendez and Senator Lautenberg, who are great partners, by the way, in framing the issues for the public in the State of New Jersey in making sure that we are addressing these issues and moving forward. We are really in a partnership. I hope that we will have one more broadly with the Federal Government.

I commend both Chairperson Boxer and Senator Inhofe for inviting me. Thank you very much for this opportunity to talk about an issue that, I guess I would concur that I am pretty well convinced we have a problem. I read the IPCC report and find it chilling.

We have tried to, as you mentioned, Madam Chairman, set statewide targets for stabilizing New Jersey's greenhouse gas emissions, both resetting to 1990, but also putting together a long-term vision that will have to be matched with restructuring the 80 percent below 2006 levels by 2050. It should not be achieved on a precipitous basis. It needs to be done over a period of time, and restructuring our economy will be good. It is important that those of us at State and local levels are addressing this issue. I am proud of the steps that are being taken.

I may not be the terminator of greenhouse gases, but we are working very hard to actually be a part of a broader movement that is occurring across the Country that recognizes the need, the vulnerability, but also accepts that there is a challenge, but not a prohibitive challenge, to make sure that we do the best job we can to keep our economy strong. In fact, I think it is a false choice. I will try to comment about that in a second.

I look at this whole debate as one of both recognizing vulnerability and also recognizing opportunity. There is no question, I identify with the icehouses, fishing, if you go to the Jersey shore and its barrier coast and see the erosion of our beach line in a very tangible way, you can do the scientific research, which you can see for yourselves the reality. Something is changing. I believe it is the unchecked human caused emissions that are a part, if not the driving force of this. They have severe adverse impacts to our environment, and I believe the economy, since we are driven so much by our tourist economy and so much of our densely populated State lives within 50 miles of the coastline. I don't think this is just an issue that you can only look at what it is going to do to your business climate. You have to look at it much more broadly. I think New Orleans is a pretty clear case that there are vulnerabilities that end up costing money.

That is the vulnerability side. On the opportunity side, and by the way, I could have talked about national security and energy independence with regard to vulnerability. I will leave that to other folks. The opportunity is this can be an economic driver in our society. We look at it as a driver for new markets in efficiency and clean energy technologies, technological innovation. New Jersey wants to be at the forefront, including by the way, clean coal technologies. We want to see that happen. We think we can change that carbon footprint.

And I will say that there is another advantage. The States that are the first movers in this will have a competitive advantage when they speak to what happens in the world as we go forward. This change is going to be addressed. It is just when, not whether, in my view. If we in the State of New Jersey or California or New York or wherever it is that you have addressed these issues, will be in a much better position to have a stronger economy as time goes on. It shouldn't, again, be precipitous. It needs to be as we go forward.

So I am very, very keen on making sure our State fulfills its responsibilities in being a strong voice for change here. It is important, though, that we begin to deal with this at the Federal level. I think I have heard these debates some time before, as Senator Clinton mentioned. I think we heard them actually in 2001 and 2002. But we need to do this for very serious reasons that apply to people's lives, like businesses need to make long-term capital plans. We need to make sure that the leakage problems that go on when we do it in one region or one State don't end up undermining the efforts. We all live in one world. So I think it is important that we do it.

We need resources from the Federal Government to go along, whether it is developing new technologies like the strategic energy investments that Senator Clinton talked about or others. We need to be working on developing the output. That is going to take dollars, and I think the Federal Government needs to be working on that with us. We are going to put together, we are going to ask for a Governor's climate protection leadership council. I am going to call for all the Governors, hopefully we will get as many as possible to participate in this, both as a voice to push forward, the kinds of things that I think have been suggested, to improve it on targeting, but also in implications for policy. We need to move forward there.

So I hope that you all will pass meaningful legislation, not just legislation that checks the box, but something that actually gets us into a position where we are changing. I think you need a portfolio approach. It is not just about energy production and powerplants. It is also about CAFE standards. It is about making sure that we have building codes that work and produce efficiencies. It is about renewable portfolio standards. It is a composite of things. If we don't think of it on a holistic basis, I think we will fail.

In my formal statement I have laid down several principles that I think should be included in Federal legislation. There certainly should be a strong science basis to that, we ought to have a portfolio approach, as I talked about. You ought to look to the States for that laboratory of experimentation that was talked about.

But maybe just as important, I am a little fired up about this with respect to chemical security efforts, we shouldn't have Federal legislation that preempts States that actually are taking aggressive stands with regard to pushing forward on this. So I commend the committee and the Chairwoman for the efforts to put together the leadership to move this forward. This is one of those issues that is most important to the future of our children and children's children. It is bipartisan and there is bipartisan support for us taking

this on. I hope that you will come to a positive conclusion in embracing many of the ideas.

Thank you, Madam Chairman.

[The prepared statement of Governor Corzine follows:]

STATEMENT OF JON S. CORZINE, GOVERNOR, STATE OF NEW JERSEY

Thank you Chairwoman Boxer and Senator Inhofe for inviting me to testify. I particularly want to thank my good friend, the senior Senator from New Jersey, Senator Lautenberg, who has long been a leader on environmental protection. I am happy to be back among friends and I want to commend all my former colleagues and committee members on both sides of the aisle for holding this hearing and taking the steps necessary to begin tackling the issue of climate change on a national level.

As most of you know, I recently issued an Executive Order that sets statewide targets for stabilizing New Jersey's greenhouse gas emissions at 1990 levels by 2020 and reducing greenhouse gas emissions to 80 percent below 2006 levels by 2050.

Yes, it is true that the challenges New Jersey faces are merely part of a much larger global problem. And, yes, we need to overcome the most crippling barrier we face—the false idea that we can't reduce greenhouse gas emissions without hurting the economy.

But I took this action because climate change, driven by unchecked human-caused emissions of greenhouse gases, will result in severe adverse impacts to both the environment and economy of New Jersey.

New Jersey is especially vulnerable to the environmental and economic effects of climate change, including the effect of sea level rise on the State's densely developed coastline from increased incidence and severity of flooding. Likewise, New Jersey's economy is also especially vulnerable to the effects of climate change with our active ports, a vibrant agricultural sector and a significant coastal-based tourism industry.

While climate change presents acute risks for New Jersey, addressing this challenge also provides great opportunity. Reducing greenhouse gas emissions will support New Jersey's economic growth strategy by creating economic drivers that build markets for energy efficiency and clean energy technologies, and spur technical innovation and job growth.

In short, reducing our carbon footprint can and should go hand-in-hand with increasing economic vitality.

Moving aggressively now to reduce greenhouse gas emissions will also place New Jersey's economy at a competitive advantage in responding to the requirements of an anticipated Federal program to reduce greenhouse gas emissions.

I am not alone in recognizing the economic opportunities presented by reducing greenhouse gas emissions. My counterparts in Maine, Vermont, New Hampshire, New York, Massachusetts, Connecticut, Rhode Island, Delaware and Maryland, along with New Jersey, are leading the charge through our work on the Regional Greenhouse Gas Initiative (RGGI).

Governors Schwarzenegger of California, Napolitano of Arizona, Richardson of New Mexico, Gregoire of Washington, and Blagojevich of Illinois have all set aggressive greenhouse gas emissions reduction targets for their States. Additionally, Governors of five western States have formed the Western Regional Climate Action Initiative.

Each day, additional States make commitments to fight the battle against global warming—regardless of whether they are red or blue—in large part because of the vacuum of leadership at the Federal level.

While States are currently taking the lead, we need Federal action to set minimum requirements that allow businesses to make long-term capital planning decisions. State efforts will provide many useful lessons to inform the design of Federal legislation. However, absent unifying Federal policy that sets minimum requirements, multiple State efforts will create an environment of uncertainty for business.

States' actions are the foundation for future Federal programs and, as such, the Federal Government needs to recognize the critical resources States bring to bear on this issue. Federal monies need to be made available now to States who are leading in the development of policies on this issue, acknowledging the critical role that those States' planning and actions have on development of Federal programs.

To build momentum for Federal action, I intend to reach out to other governors that have asserted strong leadership in reducing greenhouse gas emissions to call for the formation of a Governors' Climate Protection Leadership Council. I believe that the time is ripe for States demonstrating leadership in reducing greenhouse gas emissions to coordinate their efforts, both to accelerate progress in implementing

emissions reduction policies at the State level and to drive the policy debate at the Federal level.

A coalition of leadership States will provide a more effective voice of advocacy for a strong Federal greenhouse gas regulatory program that acknowledges a role for States in its design and implementation.

It is imperative for Congress to act, but it is also imperative for Congress to act to create meaningful—not symbolic—Federal laws. Weak or marginal Federal laws will only turn back the progress States have made.

Today I ask you to redouble your efforts to pass meaningful Federal climate change legislation. The long-term wellbeing of New Jersey ultimately depends on a strong Federal program to reduce greenhouse gas emissions, as well as a reengagement by the Federal Government in international negotiations to further develop a global response to climate change.

Additionally, more emphasis needs to be placed on energy efficiency initiatives, such as new appliance standards and enhanced building codes. I urge you to increase the Corporate Average Fuel Economy ("CAFE") standards. In New Jersey, nearly 50 percent of our carbon dioxide emissions are from the transportation sector. Increased fuel mileage standards at the Federal level will greatly assist in our efforts to meet our climate change goals.

I have attached a list of principles for Federal action on climate change that draws from the approach my administration has taken to designing emissions reduction policies and measures, both at the State level and through regional efforts, such as the Regional Greenhouse Gas Initiative.

I hope that you will find these principles useful as you consider the multitude of Federal climate change bills that have recently been introduced.

At a minimum, Federal climate change legislation should establish strong science-based emissions reduction limits. An emissions reduction on the order of 80 percent relative to current levels by 2050 will likely be needed to avoid dangerous interference with the climate system.

Federal legislation should also acknowledge that a portfolio approach is required, and that implementing a Federal cap-and-trade program alone would be ill advised and insufficient. State climate change action plans have evaluated a multitude of policy measures for reducing greenhouse gas emissions. This portfolio approach should inform the development of Federal legislation.

Federal legislation should acknowledge an ongoing role for States in the design and implementation of a Federal emissions reduction program. Congress can learn a great deal by reviewing the work already done at the State level to evaluate and develop greenhouse gas emissions reduction policies. One prominent example is the Regional Greenhouse Gas Initiative, which is the only effort in the United States to date to actually articulate the detailed design of a CO_2 cap-and-trade program for the power sector. A role for States should be institutionalized through Federal legislation.

Finally, I want to underline the following. States are currently the leaders in addressing climate change, and will likely continue to push the envelope after Federal legislation is enacted. Federal legislation should facilitate the role of the States as policy innovators by explicitly preventing Federal preemption of State programs that go beyond Federal minimum requirements, as well as preventing preemption of State programs outside the scope of Federal initiatives.

New Jersey is a great example of this innovation. While the goals I have set for New Jersey are aggressive, we believe they can be met, and we intend to meet them by building on actions already underway to reduce greenhouse gas emissions.

We have played a leadership role in the Regional Greenhouse Gas Initiative ("RGGI"), the first-ever cap-and-trade program addressing CO_2 in the United States. RGGI will cap power sector CO_2 emissions in 10 Northeast and Mid-Atlantic States at approximately current levels through 2014 and reduce emissions to 10 percent below this level by 2019, a reduction of 16 percent relative to projected 2020 business-as-usual emissions.

We have enacted California's greenhouse gas tailpipe standards for light-duty vehicles, which is projected to result in an 18 percent reduction in CO_2 equivalent emissions from the New Jersey light-duty vehicle fleet in 2020 relative to projected business-as-usual emissions.

We have increased the New Jersey Renewable Portfolio Standard to 20 percent by 2020, which will require 20 percent of all electricity sold at the retail level in New Jersey to come from Class I renewable energy sources, such as solar, wind, and sustainable biomass.

I have directed our Energy Master Plan Committee, a multi-agency initiative, to develop recommendations for reducing statewide energy use by 20 percent in 2020

relative to business-as-usual projections. Approximately 85 percent of New Jersey's greenhouse gas emissions are due to combustion of fossil fuels for energy.

I have appointed a Director of Energy Savings in the Department of Treasury to set targets for reducing energy usage in State facilities and reducing fuel consumption by the State vehicle fleet.

These measures take us a long way toward meeting New Jersey's 2020 emissions target, but further actions will be necessary. I have directed New Jersey's Department of Environmental Protection, in coordination with representatives of the Board of Public Utilities, the Department of Transportation, and the Department of Community Affairs, to provide recommendations to me within the next 6 months for achieving New Jersey's 2020 and 2050 greenhouse gas emissions reduction targets.

Thank you for this opportunity to testify on this important issue. I look forward to working with you as we jointly tackle the historic environmental challenge of climate change at both the Federal and State level.

ATTACHMENT

PRINCIPLES FOR EFFECTIVE, SCIENTIFICALLY SOUND FEDERAL CLIMATE CHANGE LEGISLATION

Emissions Reduction Requirement.—Incorporate a science-based, long-term emissions reduction requirement with a goal of avoiding dangerous anthropogenic interference with the climate system. Based on current state of the science, legislation should stabilize and begin to reduce greenhouse gas emissions within the next 10 years, and achieve emissions reduction of 80 percent relative to current levels by 2050.

Legislation should institutionalize a periodic review of climate science and allow for a revision of emissions reduction requirements based on the current state of the science.

Policy Approach.—Pursue a portfolio approach to reducing emissions, acknowledging that a cap-and-trade program may be appropriate for some sectors (e.g., large stationary sources), but that other policies may be more appropriate for addressing emissions from other sectors. States have a unique capacity to implement a portfolio of policies and measures that address energy production, energy efficiency, transportation, waste management, agriculture, and other economic sectors.

Design Process.—Learn from and build upon the policy work already completed or underway at the State level when crafting federal emission reductions programs (e.g., RGGI, California AB 32, state climate action planning processes).

Implementation Process (Role for States).—Institutionalize a role for States in designing and implementing statutorily mandated federal emissions reduction regulations under the auspices of a federal portfolio approach. This would provide a role for States to help articulate the details of Federal emissions reduction programs, building upon the analyses being done by leadership States through their climate action planning processes and regional emissions reduction programs such as RGGI.

Explicitly prevent federal preemption of State programs that go beyond federal minimum requirements, as well as preemption of State programs outside the scope of federal initiatives.

Cap-and-Trade Program Design.—Avoid the use of safety valves or price caps.

Allocate allowances in a manner that maximizes consumer benefits and market transformation impacts. In the electric power sector, allowances should be auctioned, in recognition that large portions of the United States have instituted competitive wholesale electricity markets. The monies from the auctions should be used for measures that both reduce our carbon footprint and enhance our competitiveness, such as energy efficiency projects.

Signal that new conventional coal-fired powerplants constructed from this day forward will not be grandfathered under a federal cap-and-trade system, and will need to purchase allowances on the open market.

Limit the use of emissions offsets, to ensure that a majority of emissions reductions are achieved from the capped sector or sectors. Emissions offsets should be incorporated as a flexibility mechanism that is designed to be supplemental to on-system emissions reductions.

Design robust requirements to ensure that emissions offsets are of high quality and represent incremental emissions reductions beyond business-as-usual reductions. Should include strong additionality criteria to avoid crediting of "anyway tons" and provide a reasonable assurance that the cap-and-trade program is what is actually driving emission reductions achieved through offsets. Quantification and

verification protocols should be rigorous and detailed, and apply conservative assumptions when appropriate.

RESPONSES BY GOVERNOR CORZINE TO ADDITIONAL QUESTIONS FROM SENATOR THOMAS

Question 1. New Jersey is one of many States that have adopted regional efforts to reduce greenhouse gas emissions. I am concerned that the costs associated with making these changes are inevitably passed onto consumers. Can you describe to us what you believe are the top 3 most affordable ways to achieve these greenhouse gas emissions cuts?

Response. The backbone of any greenhouse gas emissions reduction program is the implementation of aggressive mandatory policies and financial incentive structures to improve end-use energy efficiency. Very significant potential remains to reduce energy use through improvements in the residential, commercial, and industrial sectors. Energy efficiency improvements provide net financial benefits and often increase economic competitiveness. Aggressive energy efficiency improvements can also serve to reduce the market price of primary fuels, such as natural gas. In the electricity sector, aggressive energy efficiency and demand-side management actions have been shown to reduce the price of wholesale electricity at times when these prices are at their peak. Energy efficiency and demand-side management also enhances electricity reliability and defers the need to expand electricity transmission and distribution infrastructure, providing additional cost savings to consumers.

Question 2. You discussed the Executive Order you've issued to stabilize gases at 1990 levels by 2020 and reduce them further by 2050. Can you explain the enforcement mechanism that was included in the Executive Order to make sure that those targets are in fact, achieved?

Response. The greenhouse gas emissions reduction targets I set through Executive Order No. 54 were intended to focus multiple State agencies and policies on a unified objective of reducing greenhouse gas emissions. Pursuant to the Order, a number of key State agencies, led by the Department of Environmental Protection, were tasked with providing to me specific recommendations by the end of the summer for policies and mechanisms to meet both the 2020 and 2050 targets. In addition, the DEP will be required to report progress towards meeting the targets every 2 years to measure progress and recommend whether additional measures are necessary.

A number of actions New Jersey is taking now to reduce greenhouse gas emissions place the State on a trajectory to meet the 2020 target, although additional measures will be necessary. The State is already targeting the two largest greenhouse gas-emitting sectors through mandatory programs and has proposed an aggressive statewide energy efficiency goal. Key measures enacted or under consideration include the following:

- The New Jersey Energy Master Plan goal of reducing statewide energy use by 20 percent in 2020 relative to projected business-as-usual energy use, and recommended measures to achieve this reduction, would achieve significant greenhouse gas emissions reductions (more than 85 percent of New Jersey greenhouse gas emissions are due to combustion of fossil fuels for energy). Completion of the Plan is expected in late 2007.
- Enactment of the California Low Emission Vehicle (LEV) program greenhouse gas omissions standards for tight-duty vehicles is projected to result in an 18 percent reduction in CO_2-equivalent emissions from the New Jersey light-duty vehicle fleet in 2020 relative to projected business-as-usual emissions. The adopted rules require automakers to reduce fleet-wide average greenhouse gas emissions from the vehicles they sell in New Jersey 30 percent by 2016.
- Implementation of the Regional Greenhouse Gas Initiative (RGGI) is projected to result in a 16 percent reduction in regional power sector CO_2 emissions in 2020 relative to projected business-as-usual emissions. The first mandatory market-based program to reduce carbon emissions in the United States, the RGGI cap-and-trade program will cap regional powerplant CO_2 emissions at approximately current levels from 2009 through 2014 and reduce emissions 10 percent by 2019.
- The increase of the Renewable Portfolio Standard in 2006 to 20 percent by 2020 will support achievement of the RGGI cap and will lead to supplemental greenhouse gas emissions reductions that occur outside the geographic scope of RGGI (e.g., portions of the PJM electricity control area not subject to the RGGI program).

Question 3. You discussed the economic advantages of acting early to make abiding by a federal requirement to reduce these gases easier. Do you believe that the economic advantages for your State remain intact if Congress decides against implementing a mandatory national program to reduce greenhouse gas emissions?

Response. The economic advantages to New Jersey of acting now to reduce greenhouse gas emissions are apparent. Reducing greenhouse gas emissions will support New Jersey's economic growth strategy by creating economic drivers that build markets for energy efficiency and clean energy technologies, and spur technical innovation and job growth. While I believe that a national program is inevitable and crucial, given the compelling scientific consensus that human activities are driving climate change, New Jersey would still derive a competitive advantage through efforts to reduce greenhouse gas emissions, were Congress to decide against implementing a federal program. Energy efficiency, which is the backbone of New Jersey's strategy for meeting the 2020 emissions reduction target, will provide net economic benefits for the State and reduce our vulnerability to fossil fuel price volatility. In addition, improving energy efficiency will provide an engine for job growth, as saving a unit of energy creates more jobs than supplying one. Rather than shipping dollars out of State to purchase primary energy we will be investing dollars in the State to tap the large available energy efficiency "virtual supply" to meet a greater portion of New Jersey's energy needs. As a result, I strongly believe that aggressive greenhouse gas emissions reduction policy is well aligned with sound energy policy in supporting the long-term sustainable growth of the New Jersey economy.

RESPONSES BY GOVERNOR CORZINE TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. Governor, given that the Kyoto Protocol cap and trade program is providing to be such a colossal failure, would you tell us how New Jersey's situation is different that would explain your optimism that a cap and trade program will work in New Jersey?

Response. Emissions trading programs addressing SO_2 and NO have demonstrated that cap-and-trade programs spur innovation and achieve emissions reductions at a significantly lower cost than originally projected by policy makers. Given the numerous potential measures and technologies for reducing greenhouse gas emissions in the context of a multi-sector emissions trading program, and the wide variation in control costs for different measures and technologies, there is every indication that greenhouse gases are even more amenable to a cap-and-trade approach than criteria pollutants.

Question 2. Do you plan to build more nuclear plants in your State and do you support nuclear power?

Response. Nuclear energy provides approximately 52 percent of New Jersey's in-state generation and obviously plays a significant role in our energy portfolio. A new nuclear facility has not been ordered in the United State in 28 years, however recent changes in the federal policy have brought about a resurgence in nuclear energy. Several reactors are in various stages of planning, international nuclear vendors are forming new alliances and rising uranium prices have led to the development of new mines.

In spring 2007, PSEG announced that they were in exploratory talks with another company to build another reactor, most likely at their Salem Generating Station in southern New Jersey. The company cited the need to identify its intentions by the end of 2008 in order to take advantage of federal incentives, including tax credits, risk insurance and loan guarantees.

Question 3. Where are you going to get your emission reductions to meet this target? Are you planning to shut down all remaining coal plants in your State and replace them primarily with natural gas?

Response. The emissions reduction targets I have set for the State are multi-sector and are not limited to the electricity sector, as the question suggests. I have tasked an interagency working group to provide recommendations to me by the end of the summer for how best to meet both the 2020 and 2050 Statewide emissions reduction targets.

ADDRESSING ELECTRICITY SECTOR EMISSIONS

New Jersey is a leader in the Regional Greenhouse Gas Initiative (RGGI), a 10-state CO_2 cap-and-trade program for the power sector slated to begin in 2009. Extensive electricity sector modeling during the development of the RGGI program, using a model widely used by the industry itself, has shown that the costs of the

program will likely be modest and are not projected to result in a significant retirement of existing coal-fired electric generating capacity in the region.

While there are currently no fully commercialized end-of-stack control technologies for CO_2, there are emerging end-of-stack options in the early commercialization and deployment phase, including carbon capture and storage technologies and carbon scrubbing technologies. Placing a price on carbon through a cap-and-trade program is critical to speeding the commercialization of these technologies, which will lower long-terms emissions reduction costs. These technologies will facilitate a continued role for coal-fired generation in a carbon-constrained economy. Absent end-of-stack controls, a number of compliance options are available in the near-term to electric generators subject to RGGI, including heat rate improvements, fuel switching, co-firing of biofuels, environmental dispatch of a company portfolio of units that considers the CO_2 emissions rate of individual units, and the use of emissions offsets.

RGGI will also address the demand-side of the equation, through an auction of allowances and the use of the realized revenue to provide incentives for improvements in electricity end-use energy efficiency. This approach is discussed in more detail in response to question no. 4.

Question 4. It is a fairly well understood economic phenomenon that closing significant numbers of coal plants increases gas demand and increases both the average cost and volatility of natural gas prices. Aren't you worried about higher electric costs in your State, lost jobs in the manufacturing sector which is heavily reliant on natural gas as a feed stock?

Response. While RGGI is not expected to lead to a significant retirement of coal-fired generation, the RGGI program is addressing emissions reduction from both a supply-side and demand-side approach. The demand-side component of RGGI will mitigate both electricity and fuel price increases resulting from the imposition of a carbon cap.

The RGGI cap-and-trade program establishes a regional emissions budget (the cap), and creates allowances, each of which allow a regulated source to emit one ton of CO_2. These allowances may be traded freely among both regulated and non-regulated parties. At the end of a compliance period, a regulated source must submit allowances equivalent to its emissions. In past cap-and-trade programs for sulfur dioxide (SO_2) and nitrogen oxides (NOx), allowances were distributed to sources for free, often based on historic operation. The RGGI memorandum of understanding (MOU) sets forth a different approach. Under the MOU, the RGGI-participating States agreed to allocate a minimum of 25 percent of the allowances to support "consumer benefit or strategic energy purposes."[1] The understanding among RGGI-participating States is that these allowances would be auctioned and the revenues would be used to support the general program goals outlined in the MOU.

During the negotiation of the MOU, New Jersey was at the forefront in advocating for a large consumer allocation, and also advocating that a primary focus of this allocation be on reducing electricity demand in the RGGI region. No end-of-stack controls are now commercially available to limit CO_2 emissions.[2] As a result, a CO_2 cap-and-trade program will benefit from having a strong end-use component integrated into its design. This allows RGGI to adopt both a supply-side (electricity generation) and demand-side (electricity use) focus, facilitating the achievement of emissions reductions at least cost.

Electricity market dynamics also support the use of CO_2 allowance value to reduce electricity demand, which will in turn reduce aggregate RGGI compliance costs. RGGI is being implemented in a restructured, competitive wholesale electricity market. Electric generators are therefore expected to factor the opportunity cost of using CO_2 allowances into their bid prices whether allowances are given out for free or they are required to purchase allowances on the market.[3] As a result, the carbon compliance cost of the marginal generation unit will be factored into the market-clearing price of electricity, which will allow generators subject to RGGI to recover a significant portion of their compliance costs through an increase in the wholesale market price of electricity (assuming generators must purchase allow-

[1] The MOU defines these terms as including "use of allowances to promote energy efficiency, to directly mitigate electricity ratepayer impacts, to promote renewable or non-carbon-emitting energy technologies, to stimulate or reward investment in the development of innovative carbon emissions abatement technologies with significant carbon reduction potential. . . ."

[2] As mentioned previously, there are emerging end-of-stack options in the early commercialization and deployment phase. Absent end-of-stank controls, a number of compliance options are available to electric generators subject to RGGI, including heat rate improvements, fuel switching, co-firing of biofuels, environmental dispatch of a company portfolio of units that considers the CO_2 emissions rate of individual units, and the use of emissions offsets.

[3] Allowances will have a market value, irrespective of the original allocation method.

ances). If allowances are distributed for free, this allows the generation sector as a whole to realize a net increase in revenues as a result of the cap-and-trade program, because revenue received through a rise in wholesale electricity prices will substantially exceed CO_2 compliance costs. This dynamic has in fact been borne out through the initial experience of the European Union Emissions Trading Scheme for CO_2 which allocated the vast majority of allowances to regulated sources for free. Early market impacts in the EU have generated significant controversy and led for a call by many to auction allowances.

Question 5. New Jersey relies far more heavily on natural gas for home heating than in other States on average. Aren't you worried about heating costs for the elderly, poor and working class in New Jersey?

Response. As mentioned previously, aggressive efforts to reduce energy demand will provide net economic benefits and employment gains while reducing greenhouse gas emissions. A distinction should be made between energy prices and energy costs. A carbon constraint will increase prices for conventional fossil energy. However, the price signal from a greenhouse gas constraint will also incentivise energy efficiency, which if pursued aggressively, could reduce total energy costs paid by consumers. I do acknowledge that the poor face a higher energy cost burden as a percentage of their total income. For this reason, I support channeling energy efficiency incentives to low-income communities to help low-income consumers reduce their energy costs through the implementation of energy efficiency improvements and the provision ratepayer assistance where appropriate. We intend to dedicate a significant percentage of the revenue from the sale of RGGI allowances to support the energy needs of low-income households.

Question 6. Since oven the Bingamnan proposal here in the Senate—which covers the entire economy—would only reduce temperatures by 0.008 Celsius, what good do you think your plan will do in reducing global temperatures and do you think it is worth the harm it will do to the working class in your State?

Response. Addressing climate change requires a global commitment from multiple nations, States, and localities. No action by single actor can solve a global environmental problem. However, the fact that multiple parties must take collective action does not negate the environmental value to be derived by the actions of each party, nor argue against action by individual parties. Such logic is an excuse for inaction, and ignores the reality that the global emissions reductions necessary to stabilize the climate will be achieved through incremental emissions reductions by many nations, States, and localities.

As a State uniquely vulnerable to the impacts of climate change, New Jersey has a responsibility to take aggressive action to reduce greenhouse gas emissions. New Jersey is especially vulnerable to the environmental and economic effects of climate change, including the impact of sea level rise on the State's densely developed coastline from increased incidence and severity of flooding. Likewise, New Jersey's economy is also especially vulnerable to the impacts of climate change with our active ports, a vibrant agricultural sector, and a significant coastal-based tourism industry.

The actions by New Jersey and other States, collectively through regional programs and individually, is in fact bearing fruit beyond State borders. State action is driving action at the federal level, which is vital if New Jersey hopes to mitigate the impact of climate change on our economy, infrastructure, and environment. Action at the federal level in the United States is in turn vital if we hope to bring large developing nations such as China and India into a mandatory international emissions reduction framework.

Senator BOXER. Thank you so much, Governor. It is wonderful to have you back in the Senate.

I am going to keep, if it is OK, including myself, keep the question period to 4 minutes so we can get to our next panel.

Governor, I want to ask this question based on your expertise in the financial sector that you bring to your work. Earlier this week, Goldman Sachs, together with other investment firms, announced takeover plans for TXU, a Texas utility. Part of the deal was that the new TXU would scrap plans to build traditional style coal-fired powerplants. Do you think the investment community is waking up to this new reality and taking global warming into account as it plans for the future?

Governor CORZINE. Yes.

[Laughter.]

Senator BOXER. Do you see other example?

Governor CORZINE. I think actually what you are seeing is investors realizing that change is in process. It is entrained. That to invest in a power company that is not going to reflect that over a period of time is to actually impair the rates of return on capital for the buyers. The people that are actually involved in this TXU, aside from the Goldman Sachs people, who I don't know, are going to demand long-term rates of return on capital that are commensurate with the best alternatives. I think they are reflecting through those decisions what a lot of investors are doing, is we ought to get ahead of the curve as opposed to being behind it, which would be the case if you continue to build the 11 powerplants without the new technology.

Senator BOXER. Sticking with the economic approach, are you familiar with the Stern Review?

Governor CORZINE. I am not.

Senator BOXER. Sir Nicholas Stern, the former chief economist of the World Bank, conducted a recent study, October 2006, of the cost of climate change. His principal conclusion is that the overall cost of climate change are equivalent to losing at least 5 percent of global GDP each year. The worst case scenarios increase the loss to 20 percent of global GDP. Based on the report's findings, a dollar invested now can save $5 later.

Now, I am not asking you whether you agree with this, obviously you haven't read the report. But he is extremely well thought of.

So I think the false choice, as you used that expression, that we have to choose between a terrible, if we do anything about global warming we are going to see terrible economic atmosphere is absolutely refuted by the experts. Coming from California, where we have done an amazing job in a bipartisan way, and I would say it is nothing to do with liberals, it is just smart, common sense steps on both sides of the aisle to make sure that we are energy efficient. We are actually saving money. Our businesses are saving money.

So in my minute that I have left, I would like you to just expound a little bit about this shibboleth, as I call it, or if you do something for the environment you are going to have a weak economy. Because I think it is the opposite.

Governor CORZINE. Well, as I said, if you use a portfolio approach, you are looking to energy efficiencies, which hopefully will use less energy to accomplish the same ends if you have a renewable portfolio standard, that you don't implement precipitously but you do it over a period of time, you will have alternative sources that are competing. If everyone is operating with cleaner technology and we have a more healthy environment, I think it will show up in some of our costs with regard to health care and other issues.

I believe there is a tremendous economic opportunity for those that are the creators of new technology and bring innovation to this. That is what you are seeing by this TXU investment. I think this is clearly a situation where there are some identifiable costs by not dealing with it, whether it is the shoreline along New Jersey, 127 miles of Atlantic Ocean that is no longer as productive as it would be otherwise, or the other elements that I talked about

against, yes, there will be some short-term costs. But those will be more than paid for, in my view, by the positives that come through this process.

Senator BOXER. Thank you.

Senator Inhofe.

Senator INHOFE. Governor Corzine, thank you for being here. It is nice to see you again.

Let me just ask you a question. New Jersey is different than most other States in that you are reliant upon coal for only 20, 19 percent, I understand, of your energy.

Governor CORZINE. Something in that nature, yes.

Senator INHOFE. Something like that. I saw the charts that were held up by Senator Bond, which showed the differences. I would suggest that my State of Oklahoma is very similar to Missouri. So it really would affect different States differently, and I think we understand that.

It is hard to compare your Executive Order to meet the 1990 levels by 2020 and then 80 percent reductions by 2050. Because that is not exactly what Kyoto did. But it is more stringent if you take it all the way out to 2050 than Kyoto.

Now, Senator Boxer brings up, and I am glad she did, the cost of this. You are probably familiar with the Wharton Econometric Survey, because that was made actually when you were in the U.S. Senate. In that, they take the Nation as a whole and say that it would be very, very punishing economically to the Country. I think the best way to characterize it is that it would cost the average family of four $2,750 a year.

I know that you are debating this, the other side of this issue, but you do not agree with that survey, is that correct?

Governor CORZINE. I think that is what an economic analysis might show, other things being equal. But I don't think other things are going to be equal at the same time. There are other issues that will provide for efficiency, alternative sources of energy and hopefully that there will be useful support for these alternative energies and clean fuels that come from the Federal Government in the same way that we supported the oil and gas industry.

Senator INHOFE. I have to try and cut it a little bit short here, because it is a 4-minute timeframe. Would you, if you are going to meet these goals, you are going to have to have some kind of energy in New Jersey. Are you suggesting more nuclear powerplants in New Jersey?

Governor CORZINE. Well, not at this point, we certainly aren't. But that is an alternative. There are other alternatives that we are very closely examining right now, wind power, offshore, we are examining methane and other biofuels. We are talking about all kinds of other ethanol approaches to try to improve and we are looking at clean coal. We are building LNG plant in southern New Jersey.

Senator INHOFE. So the clean coal, that is interesting, and I would agree with that. Actually the plants that were shut down as a result of the lawsuit in Texas, under TXU, were clean coal technology plants. In fact, they were replacing existing plants with newer technology. So I am glad to hear you say that, because there has to be a place in this mix for coal.

Governor CORZINE. We are in the mist of an energy master plan which is examining both likely demands, considering what we look to use alternative energies and efficiencies, and then we will lay out where we think we will generate that power from. But it is, it needs to be a very comprehensive approach that one takes in all these areas.

On the TXU issue, I understand, at least from the conversations that I have had from some of the people that are involved in it, that there is a very strong sense that they will put the most powerful clean coal technology in place. But I am not familiar with the details.

Senator INHOFE. Well, I would hope that would be true. However, if they are cutting down the number of new plants from 11 down to 3, that makes it much more difficult for them. Of course, this is, this in a way is a Texas problem. But it is one that Governor Perry had the courage to stand up and say, we have to have energy for our citizens without taxing them disproportionately.

Thank you, Madam Chairman.

Senator BOXER. Thanks, Senator.

Next we are going to go to Senator Lautenberg.

Senator LAUTENBERG. Thank you, Madam Chairman.

Governor Corzine, thanks for your leadership in New Jersey, in more areas than this. It is really appreciated by the citizens across the State.

Is it possible to achieve the goals that are set out in our plans for New Jersey unless we have like programs developed to the west of us?

Governor CORZINE. We would do a lot better if the programs, the States to the west of us implement these kinds of initiatives. But it is not impossible for us. We are going to implement, as you well know, higher mileage standards for light vehicles and other issues. As a matter of fact, the greatest producer of greenhouse gases in New Jersey comes from cars. So to not include CAFE standards and changes in requirements with regard to tailpipes is a huge mistake. We can do a lot of self-help work in New Jersey by addressing some of our own issues. As I talked about the renewable portfolio standard and efficiencies in building codes, can take us a long way toward getting to our 2020 objectives. Getting to our 2050 objectives, I really believe is as much in your hands as it is in ours, although we will be able to accomplish some of our ends. A lot of leakage will occur if we don't have the help of the Federal Government.

Senator LAUTENBERG. So many things we do here directly affect or are affected by other programs that are underway. For instance, in transportation, we know very well that if we put more into railroads, efficient railroads, we are going to reduce some of the pollution that comes from the cars sitting out there and that stuff.

Senator Inhofe, I think maybe tried to throw you a slider. That was in the question about nuclear energy. I want to say this to you. There was a time that in this house you wouldn't even use the word nuclear. Now the NRC has applications for plants that are being widely of interest, trying to process these. Because in desperation to do something to protect our citizens, to protect this globe of ours from disappearing in a fog that they are looking for

opportunities to reduce it. Maybe the politicians aren't always in tune with the people, but that is usually a lagging thing, anyway. It comes after elections, often, that you see the measure of the performance.

But I think it is likely that all kinds of sources will be examined, the problems that we have are not unique, there are just more of them. Governor, I commend you for always being willing to take the path that is a little bumpy to get to a smooth ride at the end. We thank you very much.

Senator BOXER. Thank you, Senator.

Senator Voinovich.

Senator VOINOVICH. Governor Senator, I am not going to ask you which title you like the best for the job.

Governor CORZINE. They have other titles in New Jersey.

[Laughter.]

Senator VOINOVICH. One of the things that I think is real important, and I am glad you brought it up, is that greenhouse gases are caused by lots of sources. It seems to me, Madam Chairman, we ought to have a chart up here about where it is all coming from, because so often we have a tendency just to concentrate on the emissions coming from fossil fueled utilities.

I am suggesting to you, when I was chairman of the National Governors Association, we tried to get together, when I was going through the chairs, to get the northeast doing lenders together with the midwest and the far west on a policy. We couldn't do it, because at that time we were fingerpointing that, you know, your problems with emissions in New York was because of the Ohio plants and then we had, and you understand this because of your background in finance, you had the utility companies that all had their oar in the water also, because whatever you did would affect their rates. There was that competitive thing.

Since that time, we have had an enormous number of mergers. So a lot of these utilities are wearing the same pair of shoes, for the most part.

It seems to me that one of the most constructive things that you could do, now that the States are getting into this, would be to see if you can get Ray Shepach and the Governors Association to really sit down and look at this issue, talk about No. 1, some type of reasonable cap and trade, and I know that frightens a lot of people, what is reasonable in that area if you are going to go that route. Second of all, to talk about the issue of technology. It is one that I brought up in my opening statement, that the technology really isn't out there. There is this concept that, oh, yes, you can do it tomorrow, but the fact is, we can't. If you look at them, the way we are spending in the Department of Energy out of the 2005 bill, we are really not doing very much at all in terms of technology dealing with greenhouse gases, particularly from utilities.

Now, Senator Clinton talks about a Manhattan project. The fact of the matter is, we don't spend the money that is necessary. It seems to me that the Governors could put together a kind of a consensus and come up here and really put the pressure on us to say, look, whether we have coal-fired or not coal-fired, we know this is an important issue that needs to be taken care of, not only for the United States, but for the world. We should be the leader in clean-

coal technology, and take care of us and take care of the rest of the world.

The other thing is that to recognize that we have an international problem and get them to come back here and talk about some initiatives that the Federal Government should be taking in order to have more of these Asian Pacific partnerships to deal with that issue, too, to put things in the kind of perspective that we need.

But I think if you keep going the way we are, every State doing this and that, this issue, I know you don't want to be preempted, but you get, if you are out in the business, you can go crazy with all the various roles that you have. What do you think about that?

Governor CORZINE. Let me take that last piece. The reason that States are being so aggressive is that there isn't a feeling of action that is occurring with regard to this issue. Now, maybe that, different people respectfully can have different views about that. But the overwhelming weight of evidence in most of our minds in at least the States that were white, that Senator Inhofe showed up, is that there is a serious problem that needs to be addressed. From a practical standpoint, it doesn't matter whether it is natural or whether it is because it is man-made. Something is going on. The reality is that we need to take action to protect the quality of life we have.

So if it is not going to happen on the Federal level, we want to be aggressive in trying to mobilize as much of the Country as we can. That is what, not on my watch, but under Governor Pataki's watch, the RGGI, or the cap and trade program was put together in the northeast and it is a Republican Governor in the west that is taking the initiative on elements of lead here.

We need to be moving. If it is not going to happen, we shouldn't be preempted by the Federal Government writing regulations that are weak-kneed with regard to it. I hope we don't do that.

I couldn't agree more that we need to invest in these technological advances. We have spent billions of dollars over decades on oil and gas production. We ought to turn that into alternative ways to produce energy that both reduce our dependence internationally, which is good for this Country to start with, and also, addresses this fundamental issue.

Senator BOXER. Governor——

Governor CORZINE. Last, I would just say, you have to take a portfolio approach. Cars, how we transport ourselves is an important ingredient in this whole process.

Senator BOXER. Thank you.

Senator Voinovich, I think you are right. I will put in the record the U.S. emissions as of 2004 that show each greenhouse gas, carbon dioxides 85 percent of the problem, methane 8 percent, nitrous oxides 5 percent and fluorinated gases 2 percent. I will put that into the record just because I think it is an important part of this discussion.

[The referenced material follows:]

EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2004

How to obtain copies

You can electronically download this document on the U.S. EPA's homepage at <http://www.epa.gov/globalwarming/publications/emissions>. To request free copies of this report, call the National Service Center for Environmental Publications (NSCEP) at (800) 490-9198, or visit the web site above and click on "order online" after selecting an edition.

All data tables of this document are available for the full time series 1990 through 2004, inclusive, at the internet site mentioned above.

For Further Information

Contact Mr. Leif Hockstad, Environmental Protection Agency, (202) 343–9432, hockstad.leif@epa.gov.

Or Ms. Lisa Hanle, Environmental Protection Agency, (202) 343–9434, hanle.lisa@epa.gov.

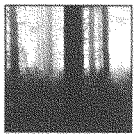
For more information regarding climate change and greenhouse gas emissions, see the EPA web site at <http://www.epa.gov/globalwarming>.

Released for printing: April 15, 2006

Higher Tiered, Innovative Approaches for Estimating of U.S. Greenhouse Gas Emissions and Sinks

The photos on the front and back cover of this report depict some of the source categories for which the United States as developed higher tiered or innovative approaches for estimate greenhouse gas emissions or sinks. For these source categories, the United States applies sophisticated modeling approaches, often combined with detailed, bottom-up data. A selection of source categories, representing every sector of the 1990-2004 U.S. Inventory, is presented in these cover photos.

HFC and PFC Consumption from ODS Substitutes: Vintaging Model: The Vintaging Model, used for estimating emissions from the consumption of HFCs and PFCs used as substitutes for ozone depleting substances, is a bottom-up model that independently estimates emissions over the lifecycle of over 50 unique end-uses. The model estimates emissions from refrigeration, air-conditioning, foam manufacturing, solvent use, aerosol use, and fire protection. Using information in end-use growth rates, consumption and emission profiles, lifetimes, and transitions away from ozone depleting substances, the Vintaging Model creates a time profile of HFCs and PFCs emissions, by gas, for the years 1985 through 2030.



Forest Carbon Stock Change: FORCARB2: FORCARB2 is a carbon stock change model that estimates carbon density for live trees, understory vegetation, standing dead trees, down dead wood, forest floor, and soil organic matter. Carbon estimates are based on tree species, dimensions, stand age, region, forest type, and growing stock volume. FORCARB2 carbon coefficients are applied to U.S. forest survey data within each state and summed over all states to estimate net forest carbon stock change for the conterminous United States.

Enteric Fermentation: CEFM: The Cattle Enteric Fermentation Model (CEFM) calculates methane emissions from cattle enteric fermentation based on a "rolling herd" population characterization that tracks cattle energy demand through different growth stages, and addresses the complex problem of simulating the cattle population from birth to slaughter while accounting for the variability in methane emissions associated with each life stage. The model simulates monthly growth stages by cattle type (e.g., beef versus dairy) in a cattle population transition matrix and correlates the energy demands with methane production based on regional diet and animal characteristics.

Non-Energy Uses of Fossil Fuels: A significant proportion of fossil fuels is not burned for energy, but used for petrochemical synthesis, reductants (e.g., for metallurgical processes), and non-fuel products (e.g., asphalt, lubricants, waxes). The U.S. Inventory employs several country-specific mass balance approaches to estimate final emissions from these processes and products. These approaches characterize the fates for each non-energy use of fossil fuels to determine the amount of carbon emissions, or storage, associated with each use.

Inventory of U.S. Greenhouse Gas Emissions and Sinks:

1990–2004

April 15, 2006

U.S. Environmental Protection Agency

1200 Pennsylvania Avenue, N.W.

Washington, DC 20460

U.S.A.

Figure ES-1

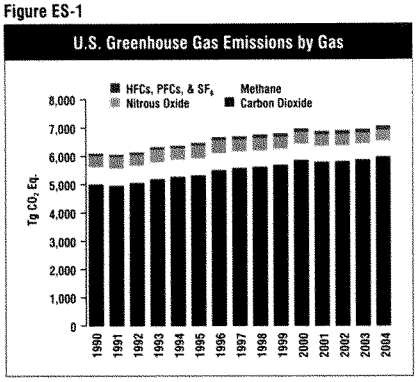


Figure ES-2

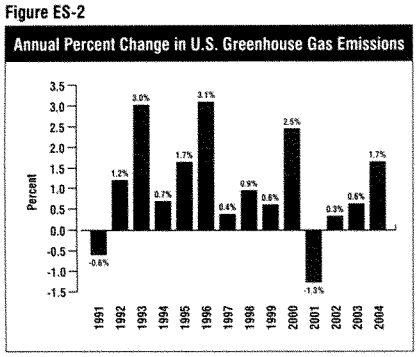
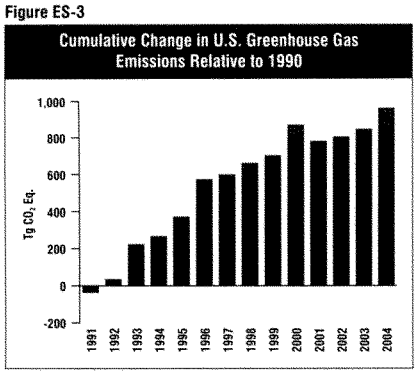


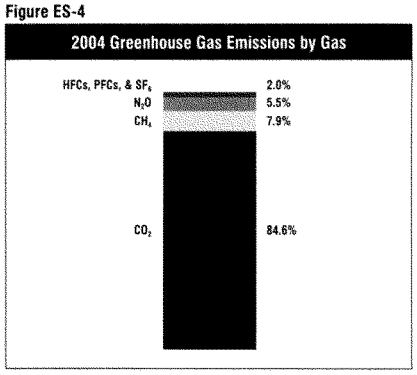
Figure ES-3



source of CO_2, and of overall greenhouse gas emissions, was fossil fuel combustion. CH_4 emissions, which have steadily declined since 1990, resulted primarily from decomposition of wastes in landfills, natural gas systems, and enteric fermentation associated with domestic livestock. Agricultural soil management and mobile source fossil fuel combustion were the major sources of N_2O emissions. The emissions of substitutes for ozone depleting substances and emissions of HFC-23 during the production of HCFC-22 were the primary contributors to aggregate HFC emissions. Electrical transmission and distribution systems accounted for most SF_6 emissions, while PFC emissions resulted from semiconductor manufacturing and as a by-product of primary aluminum production.

Overall, from 1990 to 2004, total emissions of CO_2 increased by 982.7 Tg CO_2 Eq. (20 percent), while CH_4 and N_2O emissions decreased by 61.3 Tg CO_2 Eq. (10 percent) and 8.2 Tg CO_2 Eq. (2 percent), respectively. During the same period, aggregate weighted emissions of HFCs, PFCs, and SF_6 rose by 52.2 Tg CO_2 Eq. (58 percent). Despite being emitted in smaller quantities relative to the other principal greenhouse gases, emissions of HFCs, PFCs, and SF_6 are significant because many of them have extremely high global warming potentials and, in the cases of PFCs and SF_6, long atmospheric lifetimes. Conversely, U.S. greenhouse gas emissions were partly offset by carbon sequestration in forests, trees in urban areas, agricultural soils, and landfilled yard trimmings and food scraps, which, in aggregate, offset 11 percent of total emissions in 2004. The following sections

Figure ES-4



Senator BOXER. Now Senator Klobuchar, we are going in order of arrival and back and forth.

Senator KLOBUCHAR. Thank you, Governor Corzine. That was just to explain that I am not the most senior member.

[Laughter.]

Senator KLOBUCHAR. As if anyone didn't notice.

I just wanted to follow up on some of the things you were saying about trying to move forward together and not divide people. I was thinking about what Senator Bond had been saying about the States in the midwest versus the other States represented here. I want to again reiterate that in our State just this week we passed a 25 percent renewable portfolio standard for electricity, by 2025. It was voted on 123 to 10 in the house, 61 to 4 in the State Senate, signed into law by a Republican Governor. I also point out that again, it is in the midwest, one of the States that showed up on Mr. Bond's chart.

Along those lines, I want to follow up on what Senator Voinovich was asking about, and that is the technology issues. One of the things that I see with this issue is not only should we have an obligation to lead morally, but if we don't start leading technologically, other countries are going to pick up the slack. Could you comment about that, with your background in the Senate, Governor, and in the investment world?

Governor CORZINE. Capital is going to flow to where the returns are most attractive. As a business person I have seen that happen over and over again. If other countries come up with the clean coal technology that allows you to sequester it, allows you to produce the energy, those companies that generate that technology are going to win. It takes investment to be able to get to the answers on a lot of these questions. Some of it is basic, fundamental research that doesn't have immediate paybacks. It may have paybacks in 10 years. Sequestration is one of those areas where there is a lot of work that needs to be done if you want to use coal.

We need to get on with that, or we are going to get left behind. Because other people are focusing on it and it is absolutely essential that we be at the cutting edge. We are not always going to win in the manufacturing sector in this world. We need to be at the cutting edge on innovation. So all of the Senators that have made this point, I underscore and put an exclamation point after it. I can assure you that New Jersey is going to do everything we can to make sure that our State uniquely is in the front edge of that curve.

Senator KLOBUCHAR. One last business question. You talked about in your written testimony about the effect that climate change could have on the economy in New Jersey. Specifically you mentioned the agricultural community. Could you talk a little bit about that?

Governor CORZINE. I think I actually said the tourism industry. I would hate to see Atlantic City covered with a foot of water. It wouldn't be good for the gaming business. But it is, we have had a series of floods on the non-Atlantic coastline of New Jersey on the Delaware River on a repeated basis. I think 3 out of the last 5 years, we have had major floods, because something is changing. Fifty-year floods, not just your normal floods, ones that have exceeded expectations. That is extremely expensive for the agricul-

tural elements that are there, but it is very expensive for the community at large.

So I think the practical dollars and sense that are going on year in and year out tell us we need to act.

Senator KLOBUCHAR. Thank you.

Senator BOXER. Perfect timing.

Senator Craig, and I understand that Senator Sanders, you have yielded your spot to Senator Clinton? Am I right on that?

OK. So it will be Senator Craig then Senator Clinton.

Senator CRAIG. Thank you very much, Madam Chairman, and again, Governor Senator. Thank you for coming before the committee.

There is so much of what you say I agree with, even though some of my critics would not agree that I agree. It is always fascinating to watch how we all try to stereotypically create certain images. My frustration with what you are doing is not in the microsense, it is in the macrosense. Our Country, this Senate, some years ago refused to deal with Kyoto because they knew they could not, based on current technology, do so in a uniform way without damaging the economy and because there were major players in the world out there, like China and India, who simply refused to play. They couldn't afford to based on their perception of their economy and what was going on.

I say that based on the context that we all believe in, especially those of us who have been in State legislatures, that States are marvelous laboratories from which to do things that Congress cannot collectively do. If you are a big enough State, I don't compare you with California, California has some uniqueness, you set it apart and it is still one of the world's larger economies. But the reality is quite simple, that some things that know no boundaries, i.e., like pollution, greenhouse gases and all of that, while States can create some uniqueness, they really don't become significant players. That is why national policy and broad-based international policy is so much more valuable in a concept like this.

It is my observation, and I don't blame you for the politics of your State, that you could shut the economy of New Jersey off completely and make it the greenest State in the world and convince Harry Reid to take your nuclear waste. If you did all of that, you wouldn't change the temperature in the increasing warming pattern of this earth one-tenth of 1 percent, if at all. Now, I think that is what frustrates all of us here, not of your effort. That is yours to do and that is for the citizens of New Jersey to choose.

But we are not happy with where we are as a Country. I am not. We have passed some significant energy policy and we have to do more. But in the process of doing more, none of us want to turn the economy off. It is so interesting, I was kind of Peck's bad boy week before last when I appeared before the G–8 plus 5 and suggested to them that in the last two quarters, as a unit of production, based on CO_2 emissions, the United States had become the cleanest country in the world. It was viewed as a statement of arrogance. I found that really quite fascinating, Governor, because it is a true statement. Because we are now all about technology and all technology being clean technology.

So I applaud your efforts, I don't criticize them. I have one of the cleanest States in the Nation, because I have the great privilege of having hydro-based power as a dominant force. We are inexpensive, we make California look like a pauper when it comes to energy prices. We do very well.

But we also have some coal-fired that we would hope down the road we retrofit and make cleaner. I say that as an observation, but to welcome you to the committee, and appreciate your presence here.

But Madam Chairman, I become very skeptical of a piece-by-piece solution to a very big problem. The reality that why Idaho won't be a player until we have a national solution is because we could impact our own economy but have zero effect in reality. That is, I think, a concern. We are clean now, we are going to stay clean. The citizens of our State and our legislature have said so. We are fortunate. Other States are less the case, at the same time, you heard the Senator from Missouri talking about the risk of shutdown of their economies and concerns.

My time is up. Madam Chairman, Governor, again, thank you. I don't have a question for you, but I do what to recognize your efforts and I don't collectively criticize them.

Senator BOXER. Thank you, Senator.

Senator Clinton.

Governor CORZINE. Madam Chairman, I want to say—15 seconds?

Senator BOXER. Yes.

Governor CORZINE. This is an issue that is bottoms up in its solution. We will find it. We have a community, West Orange, that is putting itself on an energy diet. The kids are out trying to convince folks to go from incandescent bulbs to fluorescent bulbs. You are right, we can't change what is happening in the global environment, because we are just a little slice of it in the State of New Jersey.

But if we don't take our steps, just like those children who are out selling this concept of going from incandescent bulbs to fluorescent bulbs, we won't change the world. It is important that those of us stand up and stand together and that increasingly is happening on a broader basis. So I think that is positive, and hopefully that will lead to a national response.

Senator BOXER. Senator Clinton?

Senator CLINTON. Amen, amen, Governor. Thank you, Senator Sanders. I appreciate that. I have to get to the Senate Armed Services Committee Afghanistan hearing.

I just want to make three points. No. 1, as we move forward, I think it is important for this committee to try as best as we can to establish an evidence base for the decisions we are going to make. My understanding is that the European Union since 1990 has actually declined in its CO_2 emissions by .8 percent and the United States has gone up by 16 percent. So I think that it is important that we get an evidence base on which to make policy.

No. 2, I am absolutely in agreement with what Governor Corzine said, and we have some mayors who are going to be testifying in the next panel, the Mayor of Seattle, the Mayor of Des Moines, the

Mayor of Dover and others. We have to have as much activity at all levels of society as we can.

I remember when Sputnik went up, and my fifth grade teacher came in and said, children, the President wants you to study math and science. I actually thought that President Eisenhower had called Mrs. Krause and told her to go tell us to study math and science.

We need a similar level of engagement. Now, my studying math wasn't going to change the world. But at the same time, having the political support starting in my household going up for President Eisenhower to do DARPA, for President Kennedy to do the space program and the Apollo program did change the world. So we are asking for action at all levels, both of Government and in the private sector as well as at the individual citizen level.

No. 3, I really wish Senator Voinovich were still here, because he and I worked together in the last Congress to pass legislation to clean up diesel. Again, it wasn't going to change the world overnight, but it was an important marker to lay down. We put in legislation with appropriations to begin to try to clean up school buses, construction equipment and other ways that said, you know, we can do better. By the way, American companies will produce the technology that we need for these pollution controls. So it was a win-win.

That is how I see the coal issue. I am very sympathetic to the concerns of those from the midwest and other States that have a very high percentage of their energy coming from coal. But I guess I would reverse the concern by saying, if we don't start now to come up with an American manufacturing base for clean coal technology, we will eventually get around to it, but the technology will be made and imported into our Country instead of made and exported from our Country.

So when TXU decided not to build 11 plants and to only build 3, that was a step forward. The problem is they are still pulverized coal plants. What they should be are new generation clean coal technology that will capture and store the carbon. We need those experiments. This Congress is the only place where that money and direction can come from, to put in at least five demonstration projects, one of them I hope is outside Buffalo, NY, because they are all ready to go. The private utility is moving forward as quickly as it can within the investment environment as it exists now.

But we could do more to incentivize that. So, I hope that Senator Voinovich and the Chair and others of us working together, we will deal with this coal issue. It is real and we can do better on it.

I guess to Governor Corzine, you mentioned the need for new technology and new thinking about climate and energy. I also have proposed a model based on DARPA, which again, President Eisenhower created after Sputnik, the Defense Advanced Research Projects Agency. It took our best minds from our universities, our private sector, and just let them loose, figure out what we were going to do.

Well, out of it did come the Internet and many other advances that have revolutionized our economy, put people to work, raised our standard of living. I am convinced if we did this in the energy field, we would have the same results within a decade. So there is

work for all of us to do. I am thrilled that under the leadership of Senator Boxer, our Congress is going to begin to address that. Again, thanks to Governor Corzine for being such a leader in this and helping to set the stage for the rest of us.

Senator BOXER. Senator Clinton, thank you so much. I like your idea of this evidence-based record. Because we do have different Senators putting out different comments and we just need to collect that. I will task the staff with that.

Senator Sanders, to be followed by Senators Whitehouse and Cardin.

Senator SANDERS. Thank you, Madam Chair.

Madam Chair, what we seem to be hearing from a number of Senators is the idea that it is absolutely imperative and Governor Corzine, you mentioned as well, I think, that we move forward in whether you call it a Manhattan project or new Apollo project, that in fact for the first time we recognize that we have a global crisis, a national crisis and that it is imperative that we harness the resources on the Federal leadership, the Federal Government has the resources, the private sector and the State and local government, that we begin to bring people together to say we have a crisis and we are going to solve this crisis within the next 20 or 30 years with the United States of America playing a leadership role.

The components of going forward are breaking our dependence on fossil fuel, increasing energy efficiency and reducing greenhouse gas emissions. I think what the Governor has said, if I understood him correctly, that you believe as we go forward in fact we can create jobs. While there will be certainly some economic dislocation, overall it can be a positive.

Governor CORZINE. It is a long-run win, absolutely.

Senator SANDERS. What I would like to ask you is, based on your background both in the private sector and in Government, how would you envisage a new Manhattan project? What would be the relationship between the Federal, State and local governments and the private sector? How can we harness the energy to develop new technologies and make this economically successful?

Governor CORZINE. Well, first of all, I think that there does have to be serious investment dollars made in the core research functions. Whether it is taking solar technology and actually making it practical, whether it is sequestration, whether it is the kinds of things that Senator Clinton talked about, and some of that may actually need some subsidization.

Senator SANDERS. Let me ask you this. I just talked to a fellow from Germany the other day who helped write legislation in Germany which pays people if they have solar paneling in their own house, they get a very good price for producing that solar paneling. It is part of a decentralized subsidy. Is that something that New Jersey——

Governor CORZINE. Sure. We actually have a clean energy plan. It is, I wouldn't write home to mom about it being the best thing in the world, but it is trying to subsidize the applications of solar and other alternative fuels. But we have to do that. We have to do it actually in the energy production field. We need, if TXU is only going to produce three clean coal plants, because that is all they can afford to do, it might be possible that we would want to give

them tax credits in the same way that we have given it for oil drilling and exploration, so that they could do four or five, if that were the demand. I don't know the layout.

We need practical work on basic research in our universities and in our research communities. Then we need real effort in bringing that into an applied context.

Senator SANDERS. Let me ask you this. I know New Jersey is not generally considered to be a major agricultural State, but in fact——

Governor CORZINE. We are the Garden State, remember.

[Laughter.]

Senator SANDERS. Right. What are you doing, what ideas do you have with regard to biofuels in the east?

Governor CORZINE. We have, unfortunately, far too many garbage dumps. So we have a lot of methane tapping that ends up producing gas. We also do——

Senator SANDERS. You are using the methane from the landfills?

Governor CORZINE. Right. We do geothermal.

Senator SANDERS. Do you do much biofuels? Are you farmers growing——

Governor CORZINE. We do not do biofuels. We are about to make a commitment on our first biofuels plant, which started out to be corn based, and we are trying to get it into cellulose.

Senator SANDERS. Thank you.

Senator BOXER. Thank you, Senator.

Senator Cardin is going to pass, is that right? And Senator Whitehouse. Then we are going to the next panel.

Senator WHITEHOUSE. Governor, I am delighted that you are here. You have the experience of executive leadership, you have the experience of having been in this building and know what we are all going through. You have considerable experience in the financial and capital worlds.

Governor CORZINE. I used to sit in that chair.

[Laughter.]

Senator WHITEHOUSE. You were this junior once.

I see a lot of the problems that we face here as ones in which the market forces operate very effectively and properly in a defined market. But they create externalities. Whether they are the negative externalities of pollution of positive externalities, in this case, of being able to seize export products in this new technology, protecting our climate from what unfortunate things we seem to see coming and the ability to concentrate both capital and expertise, so that we become sort of a center of energy and center of expertise in terms of this new technology.

Now, when you have a situation like that in which there are huge positive externalities and you don't want to just leave it to the market, because it is not reflecting those positives, to drive the public policy result, you have to accelerate the market a little bit, what from your experience in the financial world would be, I understand what you told Senator Cardin about funding research and doing all the things we traditionally do. Are there ways to jump start or accelerate in the financial and capital markets their investment in this area and what are the ones that in your experience have proven either more effective or less effective? Are there ones

you would give us caution about, ones you would encourage us to try to apply?

Governor CORZINE. That is a terrific question. I have seen loan guarantees that reduced the cost of capital that are wraparounds, you see it in the nuclear power industry, that was very important in the early stages of production of it that were really the foundation on which a lot of powerplants were built in another period and time. You see it in the housing industry. I would like to see more of it, actually, in the housing industry, so that we could have greater development of affordable housing. It is a way to both mix private capital and public capital. This is in the application fields.

I think the basic research effort is going to have to be grant work and you have to get——

Senator WHITEHOUSE. Understood.

Governor CORZINE [continuing]. The NSA and other national science foundations and other elements focused on this as an issue. But I think using loan guarantees as opposed to outright grants has often been successful in other avenues where you wanted to get broad bases to it.

Now, you know, the oil and gas industry has benefited from oil depletion allowances. This is not new work. So you can accelerate depreciation as another technique and it has been very successful. That might very well be the appropriate way to approach this issue with regard to restructuring the powerplant industry and applying clean coal technology when billions of dollars would be applied. You know, somebody asked about nuclear power earlier, you have to check, we will have to review if that were the direction that society wanted to take particularly as a transitionary step. Some of the most adamant environmentalists have actually switched to say we have to do that as an intermediate bridge. I am not advocating that, but we need to make sure that those kinds of capital elements are in place that would allow that to happen, if that is the direction we want to take.

Senator WHITEHOUSE. I thank you for your testimony, and I thank the Chair.

Senator BOXER. Thanks, Senators.

Governor, you have triggered a most amazing debate. Something about you that just brought out, I think, the best in everybody here. It has been wonderful and we thank you very much.

Governor CORZINE. Thank you very much, Madam Chairman.

Senator BOXER. Our next panel, please come forward as fast as you can, because we are going to hold your statements to 4 minutes each instead of 5. We didn't expect it to go so long, but we had such a terrific turnout of colleagues.

Senator Cantwell is here to introduce our Mayor of Seattle. Senator Cantwell, you can just sit on the end here, in Senator Whitehouse's seat, because he has left. I would love you to, because I have already given a very flowery introduction of my two wonderful friends from California, why don't you introduce to us the Mayor of Seattle, and then we will start with Senator Perata, we will work our way right down this way.

Senator CANTWELL. Thank you, Chairwoman Boxer, and members of the committee, for the opportunity to introduce the Mayor of my State's largest city, Mayor Greg Nickels of Seattle. I am

proud to be here today to introduce Mayor Nickels and even prouder of what the citizens of Washington State and Seattle have been able to do in our ongoing efforts to reduce our climate footprint and leave a livable planet for future Washingtonians.

As most of you know, the United States contributes about one-fourth of the world's greenhouse emissions, but to my frustration and I am sure many of the people on this committee, the Administration has refused to engage in an international effort to begin tackling this critical challenge. Fortunately, in the absence of Federal leadership, a number of cities and States have taken it upon themselves to try to reduce their carbon footprints and the results have been impressive.

In 2005, Mayor Nickels launched an initiative to get cities to pledge to cut their greenhouse emissions by 7 percent below the 1990 levels by 2012. His initiative is filling a vacuum nationwide. It has received enthusiastic reception and now has been endorsed by over 400 mayors in every State in America who collectively represent 60 million citizens. In our State, all our major cities have signed onto the agreement, and we are very proud of that fact. I know that our former colleague and now Governor noted the Garden State motto. Well, they don't call Washington the Evergreen State for nothing. So we are very proud of this effort.

I believe that you will hear from the Mayor and these cities that they are reaping the economic and environmental and security benefits of these initiatives. I believe these more localized efforts are part of a growing groundswell of public awareness of the threat of climate change and the urgency to do something about it. As I can say from my own State, it is very important for us to deal with this issue. I know that members of this committee may look at it as a security issue or an economic issue or the opportunity to take advantage of new, high-energy wage jobs. But for us, it doesn't matter what the motivation is. The need to act and act immediately is important.

Climate change, as the Mayor will tell you, is impacting every corner of the world. But for us in the pacific Northwest, we can become particularly hard hit, because our temperatures are rising faster than the global average. Glaciers in the Cascade Mountains and the Olympic Mountains have retreated for over the last 50 years, and climate change is expected to alter our region's historic water cycle, threatening drinking water, salmon recovery efforts and the availability of emission-free hydropower. As my colleague from the northwest was mentioning, the northwest hydro system, we are 70 percent reliant on our electricity from that hydro system. So impacts in global warming directly have impacts on that hydro system, and these changes will likely impact billions of dollars of our economic infrastructure associated with irrigation systems, municipal water supplies, national forests, ski resorts and a variety of other things. So we can wait no longer.

So thank you, Madam Chair, for your committee's work and their importance of this hearing today. Thank you to Mayor Nickels and the other panelists.

As a member of the Energy Committee, Finance Committee and Commerce Committee, we will all work with you to get legislation to the Senate floor and onto the President's desk. You will have an

ally in me, and you couldn't have found a better witness for today's hearing than Mayor Greg Nickels. Again, I thank the Chairwoman and the committee.

Senator BOXER. Thank you, Senator Cantwell. You are welcome to sit with us as long as you would like to.

Now it is with great pride I introduce our first two panelists: Senator Don Perata, a real leader on this, and to be followed by Speaker Nuñez.

STATEMENT OF HON. DON PERATA, PRESIDENT PRO TEM, CALIFORNIA STATE SENATE

Mr. PERATA. I thank you, Madam Chair and distinguished Senators. It is an honor to be here today to participate in this discussion. To date, it is very enlightening. I hope I add to that.

I am not a climate scientist nor an economist. I am a former high school teacher and a native Californian, and like all of you, an elected official that has a singular concern, and that is the planet that we leave to our kids and our grandkids.

I am going to cut more directly to something that has been riveting through the committee in the discussions, and that is whether or not you can reduce global emissions and stop climate change without doing injury to the economy. In California, we have been working on these issues for 30 years. As has been cited by Senator Boxer and Senator Clinton, we have made progress. Today, we are, in fact, Governor Reagan before he became President signed the State's first major energy efficiency law in 1974, when the first oil shock hit California and the United States.

We have in California some of the best cutting edge technology in the world. What we are seeing right now is our policies that we are making in Sacramento are being implemented down the street, across the State. We are making it possible for others in the industry to break new ground. They are investing in California, they are investing in technologies because it is good for business and jobs are being produced. In the Silicon Valley, which is better known than for anything than technology chips and things of that nature, we are finding jobs being developed in the areas of solar panels, new computers that trigger the efficiencies as we discussed in your office yesterday, where now light coming into a room can adjust the lights in the room. So you are always one step ahead of where you need to be.

In southern California, there have been great strides made for electric cars. In my own district, there is something very curious going on. We have been talking about diesel emissions. In the Bay area, there is a company that has developed and manufactures in California a device to be placed on school buses, tractor trailers, anything that has a diesel engine and can reduce immediately to zero emissions the carbon coming out of those engines.

There are 280,000 trucks traveling daily to southern California ports. That bad air ends up being blown into the Central Valley and into the Inland Empire, the middle parts of our State. So by that one device being developed, we are in effect cleaning up the air around the coast and inland. For people who say, well, that is only California, yes, but it is California. If every State is able to

do that, we first show by doing, and that is what we are finding effective in California.

California has just passed $42 billion in bonds. In that are efficiencies and green legislation, so that as we do things, we build or rebuild California, we are doing it clean and green and we are making money and creating jobs. It can be done.

I would ask only one thing in conclusion. Whatever you do, please don't do anything to preempt the strides that are being made in New Jersey, Washington, California and elsewhere. Thank you.

[The prepared statement of Mr. Perata follows:]

STATEMENT OF HON. DON PERATA, PRESIDENT PRO TEM, CALIFORNIA STATE SENATE

Madam Chair and Distinguished Senators:

Thank you for holding this hearing, and for the privilege of addressing the committee. I'm honored to be here with my fellow Californian, Assembly Speaker Fabian Nuñez, and Mayor Nickels, both of whom are national leaders in the fight against global warming.

I'm not a climate scientist or a resource economist—I'm a former school teacher, a native Californian and—like all of you—an elected official who worries about what kind of world we're leaving our kids and grandkids.

Today, I want to make three points to the committee:

First, California can serve as a model for federal efforts to combat global warming and its impacts. Last year we passed two very important laws: one prohibiting utilities from entering into long-term contracts for power produced by dirty coal-burning plants, and another setting a target to reduce the state's total greenhouse gas emissions over time.

The latter measure, known as AB 32, has received plenty of attention. It's a good law authored by Mr. Nuñez. The best thing about it is it commits the state to reining in its greenhouse gas emissions. Many of the details of how to do this must be worked out, but we're on the right track. The other law is one I wrote to promote cleaner coal technologies. I'm glad to see that the Chairwoman of this committee has included provisions of that measure in her bill. There are more than 30 new coal plants proposed in the Western United States, and 150 for the nation as a whole. California is a big customer for the electricity from those plants. Taken together, those plants could produce up to 120 million tons of carbon dioxide emissions; by contrast, the total emissions from all sources in the entire state of Oregon is about 70 million tons.

California enacted SB 1368 to send a strong signal to the western energy markets. Our energy must be clean—we won't buy power from coal plants spewing greenhouse gases by the ton. To be clear, California has not said "no" to coal; rather, we've said that we want cleaner coal plants that can provide us energy without producing massive global warming pollution.

Similar measures to SB 1368 are being considered in the Oregon and Washington legislatures. While it's gratifying to know that other states are following California's lead, there is no substitute for a national policy. So I encourage all of you to move forward with the Chairwoman's legislation.

Now, what we have done in California is much more than just pass two landmark bills. Climate change and its dramatic effects are front page news today. But long before global warming began grabbing headlines, California worked to protect the environment and reduce air pollution. California has led a quiet revolution for decades to achieve one of the lowest per capita carbon emissions rate in the country. Over the years, state lawmakers have boosted energy efficiency, increased the diversity of our energy sources and improved our air quality.

It was in fact Governor Ronald Reagan who signed the state's first major energy efficiency law in 1974, in the wake of America's first foreign oil scare. Today, the same energy efficiency programs created 30 years ago serve as a cornerstone of California's efforts to reduce greenhouse gases. By 2008, our state's energy efficiency programs will reduce carbon dioxide emissions—a major cause of global warming—by more than 3 million tons per year. That's the equivalent to taking 650,000 polluting cars off the road. And since the cheapest kilowatt of electricity is the one not used, it will save Californians millions of dollars on their monthly utility bills.

In California, we're proud to be trendsetters. And much of what we've done could easily be adapted at the national level. That brings me to my second point: We need

your leadership to win this battle. Only with your help can we transform our current fossil-fuel based economy into the new energy economy needed in the 21st century.

As you know, there are many things a state like California can do for itself, and there are many things it cannot. The challenge before you is to craft federal legislation that helps bend the curve, as California is doing, so that overall U.S. climate change emissions begin to head downward. That demands the same comprehensive approach taken by California to cover all major sources of global warming pollution—not a piecemeal plan affecting only one set of emission sources, one type of emissions, or one type of mechanism to achieve reductions. It means direct and measurable emission reductions, flexible financial and tax incentives, and addressing more than just carbon dioxide.

We also need Congress to provide tools, such as a 10-year extension of the renewable production and investment tax credit. The uncertainty over this important incentive is a big problem for new renewable energy investments.

And finally, we must have Washington's leadership to get off what the President has called "our national addiction to oil." We can do this through more efficient cars, clean alternative fuels and better transportation policies.

My third and final point is that reducing greenhouse gas emissions creates jobs and stimulates the economy. Over the past several decades, California has adopted the most aggressive clean air, energy efficiency and renewable energy policies in the United States. During that same time, our gross state product increased by 83 percent, the second largest rate of growth of any state in the country. Key business incubators—such as Silicon Valley in the north and the biotech corridor in the south—generate jobs, revenues, and clean technologies. The super-efficient solar panels produced by Powerlight Corporation in my district, and the sleek new electric cars manufactured by Tesla Corporation in the South Bay area, are examples of these technologies. Just two weeks ago, British Petroleum announced a new $500 million investment in a clean fuels research facility on the University of California campus in my Senate district.

The evidence is clear: California's climate policies are attracting business and jobs to the state, not driving them away. Business and industry leaders support strong state climate change policies like the laws we have passed in California because they know it's good for business.

In California, voters last fall approved the single largest infrastructure investment bond in the history of the United States. It provides $42.7 billion to revitalize transportation, housing, flood protection, and schools. The public wants us to overhaul our aging and inadequate infrastructure—and doing it will be good for our economy—but not at the expense of our air or environment. That is the overriding challenge of this new century: To continue to grow our economy while holding ourselves to higher standards of environmental protection.

In closing, I want to emphasize that, for all of the work we've done, even states as large as California can't do it alone. We need strong and decisive action at the federal and international levels. After all, this is a global problem. The job ahead isn't easy or painless, as some would have us believe. We've only just begun to understand the scope of global warming and the magnitude of the changes it may bring. Today, more than ever, the state and Federal Government must cooperate and attack this problem together.

Thank you again for the opportunity to testify before you today.

Senator BOXER. Very important message.

Mr. Speaker, welcome.

STATEMENT OF HON. FABIAN NUÑEZ, SPEAKER, CALIFORNIA STATE ASSEMBLY

Mr. NUÑEZ. Thank you very much, Madam Chair. I hope it is politically correct in Washington to say Madam Chair as opposed to Madam Chairman.

I want to thank you very much for inviting Senator Perata and I to express our thoughts on why California did what it did to confront the climate change concerns that we have. First of all, and certainly to all of the members of this committee, I want to be clear that when we approved Assembly Bill 32 in California, we didn't do it out of an altruistic sense that we wanted to do the right thing for the sake of doing the right thing, although that is important as

well in some case. But in California, we saw a real threat, a threat to places like Los Angeles, residents of the Central Valley as well, and farmers who, if they saw that their fresh water that they needed wasn't available to them, or could be contaminated with salinity, it was a real challenge.

We saw the threat to our natural resources, for example, including key environmental and economic treasures like the beautiful coast of California, Yosemite and Lake Tahoe. In response, through an unusual partnership between the Democratic legislature and a Republican Governor, last year in California we passed gold standard legislation, Assembly Bill 32, the Global Warming Solutions Act. AB32 establishes regulations that will phase in a 25 percent cut in carbon dioxide emissions from the State's largest emitters by the year 2020, which in essence is a reduction below the 1990 levels in that 16-year period. In 2008, the California Air Resources Board is going to begin to require industries to report carbon dioxide emissions. The Board is also going to establish a cap on those greenhouse emissions.

The data that we collect over that 4-year period is going to determine which industries are the most significant on the dioxide footprint. From 2008 to 2012, outreach programs are going to begin to educate industries on how to best achieve these reductions. Then from 2012 to 2020, industry will begin to implement efforts to reduce their carbon output and take advantage of established market mechanisms that may be required to reduce some of these emissions. Those cuts, in essence, are going to bring us down to the 1990 levels.

I want to stress that this simply was not an effort supported by Democrats in the legislature and a Republican Governor, but businesses came to the table. One of the largest utilities in California, Pacific Gas and Electric, Senator Boxer, you are very familiar with them, were strong supporters of this legislation. Entrepreneurs stepped up to the plate. Several CEOs and venture capitalists came on board, people like John Doerr, whose firm has invested in venture capital efforts such as Amazon.com and Google and many other technology firms also came to the table because they saw the importance of making this investment in alternative fuels.

Let me just say for me, on a very personal level, representing an inner city from Los Angeles, issues of environmental justice and economic opportunity are vital and are powerful, very, very powerful motivators. I want the economy for the future of the children of California to be a clean economy. I want the neighborhoods that children live in to be clean neighborhoods. I think that our enforceable limits provide clear market incentives that are going to reduce pollution and unleash entrepreneurs to pursue clean technologies in our State.

U.C. economists predict a boom in our State's annual gross product of $60 billion. One study suggests that we are going to create, over a 12-year period, 83,000 jobs in this area, Senator. Just in closing, let me say that gold built the California economy. I believe that through AB32, green is going to be what sustains it.

Thank you very much, Senator.

[The prepared statement of Mr. Nuñez follows:]

STATEMENT OF FABIAN NUÑEZ, SPEAKER, CALIFORNIA STATE ASSEMBLY

Madam Chair, thank you for inviting me to discuss California's experience confronting climate change. In California, we saw the threat to Los Angeles residents and Central Valley farmers if the fresh water they need is contaminated with salinity. We saw the threat to our natural resources, including key environmental and economic treasures like the coast, Yosemite and Lake Tahoe.

In response, through an unusual partnership between Democratic legislators and a Republican governor, we passed gold-standard legislation, AB 32, The California Global Warming Solutions Act. AB 32 establishes regulations that will phase in a 25 percent cut in carbon dioxide emissions from the state's five largest emitters by 2020. In 2008, the California Air Resources Board will begin requiring industry to report carbon dioxide emissions. The board will also establish a cap on greenhouse gas emissions.

The data we collect over a 4-year period will determine which industries are the most significant on dioxide. From 2008 until 2012, outreach programs will educate industry on how to achieve reductions. From 2012 on to 2020, industry will begin to implement efforts to reduce carbon output and take advantage of established market mechanisms. That cut will bring carbon emissions down to 1990 levels.

In addition to strong environmental support, even one of our State's largest utilities, PG&E, backed AB 32. Several high tech CEOs and venture capital leaders also came on board, including John Doerr whose firm provided venture capital to Amazon.com, Google, Intuit and other technology firms. I think they see the clear market signal we are sending to spur a high-tech, green economy for our state. For me, elected from inner-city Los Angeles, environmental justice and economic opportunity are powerful motivators. I want the economy for our children to be a clean economy. I want the neighborhoods they live in to be clean neighborhoods.

Our enforceable limit provides clear market incentives to reduce pollution, unleashing entrepreneurs to pursue clean technologies. One study found meeting the limit we've established will create 83,000 jobs. UC economists predict a boost to our state's annual Gross Product of $60 billion. Gold built the California economy. Green will sustain it.

This year, in addition to overseeing the implementation of AB 32 the Assembly is advancing legislation on green building and alternative fuels; developing R&D opportunities; reducing emissions from landfills, and using bond funds to promote sustainability. And in all of these efforts, we are at this committee's disposal to help replicate California's experience at the national level.

Thank you for this opportunity Madam Chair. And thank you for your dynamic leadership on this issue.

The Most Expensive Thing We Can Do Is Nothing

An Open Letter on Global Warming from California Economists

August 2006

Dear Governor Schwarzenegger and California Legislators,

AS CALIFORNIA ECONOMISTS with expertise in energy and environmental policy, we believe that the State of California should move quickly to control global warming gases.

California's economy is vulnerable to climate impacts, including changes in water availability, agricultural productivity, electricity demand, health stresses, environmental hazards, and sea level. Action to reduce emissions will lower the costs of adjusting to climate-related disruptions and serve as public insurance against more dramatic damages that can be expected when opportunities to adapt are limited.

While global climate change poses significant risks to the California economy, we believe that well-designed strategies to limit global warming gases can reduce emissions substantially at low or no cost to the state, and could yield economic (as well as climate) benefits. Well-designed strategies can stimulate innovation and efficiency, which could help the state become a technological leader in the global marketplace.

Global warming gases will be best managed through a combination of policy approaches. Emissions caps combined with a range of regulatory and market-based implementation mechanisms offer a particularly potent strategy because they provide clear incentives for changes in business practices and the development of new technologies. Such an approach assures that economic forces are directed to finding the most efficient means of reducing emissions.

We urge you to accelerate climate action policies that will demonstrate political leadership and create economic opportunities in California. The most expensive thing we can do is nothing.

Anthony C. Fisher, Ph.D.
University of California, Berkeley

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GLOBAL WARMING AND JOBS:

LIMITING CALIFORNIA'S GLOBAL WARMING POLLUTION WILL CREATE JOBS AND ECONOMIC BENEFITS

Economists have found that limiting California's global warming pollution to 1990 levels by 2020 will provide *tens of thousands* of new jobs for residents of the Golden State, while saving families and businesses *billions* of dollars. Today, California sends $30 billion out of the state every year to buy fossil fuels, the primary cause of our global warming pollution; this means that on average $2,500 from every California household is leaving the state. We can break that addiction and bring our money back home to invest in clean technologies, providing jobs and economic benefits for Californians. And by acting soon to limit global warming pollution, California can provide a clear market signal to spur entrepreneurs to deploy clean technologies. Leading the clean technology revolution will be the next high-tech economy fueling California's prosperity for decades to come.

A Pollution Limit Will Enable California to Lead the Emerging Clean Energy Market

No market exists in California today for clean technologies that reduce global warming pollution, because the pollution can be emitted without charge. An enforceable limit on global warming pollution will provide clear market incentives to reduce pollution, unleashing California's world-famous entrepreneurs to pursue clean technologies. By acting soon, California can capture significant economic benefits by securing a leadership position in the emerging worldwide clean energy market.

We are watching *the economic opportunity of a lifetime* unfold right in front of our eyes. Nearly every developed country in the world has committed to reduce its global warming pollution. The vast majority of emissions come from burning fossil fuels, so reducing emissions requires developing a new clean energy economy. Energy is a $700 billion a year market in the United States alone, and the world spends *trillions* every year.

Pollution Limits Spur Job Creation

Pollution limits have created large economic and job benefits that California can learn from. Since 1970, the Clean Air Act has limited emissions of smog-forming pollutants, acid rain pollutants, and other harmful air pollution emissions from power plants, cars, and factories. Over time these pollution limits have provided about $40 in public health and air quality benefits for every $1 invested, including preventing about 200,000 premature deaths every year, according to the U.S. Environmental Protection Agency. The pollution limits also spurred technological innovation and created a new air pollution control industry. Today, this $19 billion a year industry employs an estimated 130,000 people. And because the U.S. acted early to limit these air pollutants, the nation's air pollution control industry has secured a leadership position in the worldwide market. U.S. firms earn about $3 billion a year from exporting their technologies and services, and their leadership position is enabling them to capture a significant share of the growing Asian market.

The race for this massive prize has already started. The opening shot was fired a year ago when most developed countries made a binding commitment to reduce emissions. The good news is that California has a modest head start thanks to decades of progressive energy and environmental policy. The bad news is that we have not even decided yet if we are going to join the race, while the rest of the world has their sights set firmly on the finish line. And the longer we wait, the more countries will pass us by, and California will be left buying *their* technologies to power *our* future.

California knows how to lead a technology revolution. But if the state is going to lead the clean energy market, it must begin here at home. To create that market, California needs an enforceable limit on global warming pollution. It will unleash our famed innovative spirit, and if we take action now, California can lead the worldwide clean energy market, providing enormous economic benefits for decades to come.

Economists Find Large Job and Economic Benefits

Even without accounting for the benefits of securing a leadership position in the clean technology market, three independent economic studies and state agency reports show that reducing California's global warming pollution emissions to 1990 levels by 2020 will save California families and businesses billions of dollars and provide tens of thousands of new jobs.

- The Climate Action Team – a team of state agencies coordinated by the California Environmental Protection Agency - found that meeting the 2020 limit on pollution will increase Californians' income by about $4 billion and provide about 83,000 additional jobs.
- The Center for Clean Air Policy conducted an independent "bottom-up" assessment of measures that can reduce pollution emissions in California and concluded that the 2020 limit can be met and that consumers will enjoy savings in gasoline costs and energy bills.
- A team of two dozen prominent experts led by professors from the University of California, Berkeley found that just eight strategies can take California halfway to the 2020 goal, while increasing the Gross State Product by approximately $60 billion and creating over 20,000 new jobs.

Moreover, these analyses are all conservative. They do not include the sizeable co-benefits of implementing emission reduction strategies, such as improved public health, quality of life and a cleaner environment.

Bring Our $30 Billion Back Home

Every year, Californians send about $30 billion out of the state to purchase fossil fuels, including oil, natural gas and coal, the primary sources of the state's global warming pollution. On average, that means that every California household sends $2,500 directly out of the state every year. Reducing global warming pollution with solutions such as energy efficiency, renewable energy, smart growth, and improved transit will bring that money back home to reinvest in our communities.

Investments such as energy efficiency and renewable energy will provide more than twice as many jobs as investments in fossil fuel-fired power plants. And these pollution-cutting investments will simultaneously help improve the state's air quality, alleviate traffic congestion, and ensure reliable water supplies. By curbing global warming, California can bring its money back home and improve the state's economy and quality of life.

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INTRODUCED BY Assembly Members Nunez and Pavley
(Principal coauthor: Assembly Member Nation)
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DECEMBER 6, 2004

An act to add Division 25.5 (commencing with Section 38500) to the Health and Safety Code, relating to air pollution.

LEGISLATIVE COUNSEL'S DIGEST

AB 32, Nunez Air pollution: greenhouse gases: California Global Warming Solutions Act of 2006.

Under existing law, the State Air Resources Board (state board), the State Energy Resources Conservation and Development Commission (Energy Commission), and the California Climate Action Registry all have responsibilities with respect to the control of emissions of greenhouse gases, as defined, and the Secretary for Environmental Protection is required to coordinate emission reductions of greenhouse gases and climate change activity in state government.

This bill would require the state board to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program, as specified. The bill would require the state board to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020, as specified. The bill would require the state board to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions, as specified. The bill would authorize the state board to

adopt market-based compliance mechanisms, as defined, meeting specified requirements. The bill would require the state board to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board, pursuant to specified provisions of existing law. The bill would authorize the state board to adopt a schedule of fees to be paid by regulated sources of greenhouse gas emissions, as specified.

Because the bill would require the state board to establish emissions limits and other requirements, the violation of which would be a crime, this bill would create a state-mandated local program.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Division 25.5 (commencing with Section 38500) is added to the Health and Safety Code, to read:

DIVISION 25.5. CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

PART 1. GENERAL PROVISIONS

CHAPTER 1. Title of Division

38500. This division shall be known, and may be cited, as the California Global Warming Solutions Act of 2006.

CHAPTER 2. Findings and Declarations

38501. The Legislature finds and declares all of the following:

(a) Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

(b) Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

(c) California has long been a national and international leader on energy conservation and environmental stewardship efforts, including the areas of air quality protections, energy efficiency requirements, renewable energy standards, natural resource conservation, and greenhouse gas emission standards for passenger

vehicles. The program established by this division will continue this tradition of environmental leadership by placing California at the forefront of national and international efforts to reduce emissions of greenhouse gases.

(d) National and international actions are necessary to fully address the issue of global warming. However, action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, and other countries to act.

(e) By exercising a global leadership role, California will also position its economy, technology centers, financial institutions, and businesses to benefit from national and international efforts to reduce emissions of greenhouse gases. More importantly, investing in the development of innovative and pioneering technologies will assist California in achieving the 2020 statewide limit on emissions of greenhouse gases established by this division and will provide an opportunity for the state to take a global economic and technological leadership role in reducing emissions of greenhouse gases.

(f) It is the intent of the Legislature that the State Air Resources Board coordinate with state agencies, as well as consult with the environmental justice community, industry sectors, business groups, academic institutions, environmental organizations, and other stakeholders in implementing this division.

(g) It is the intent of the Legislature that the State Air Resources Board consult with the Public Utilities Commission in the development of emissions reduction measures, including limits on emissions of greenhouse gases applied to electricity and natural gas providers regulated by the Public Utilities Commission in order to ensure that electricity and natural gas providers are not required to meet duplicative or inconsistent regulatory requirements.

(h) It is the intent of the Legislature that the State Air Resources Board design emissions reduction measures to meet the statewide emissions limits for greenhouse gases established pursuant to this division in a manner that minimizes costs and maximizes benefits for California's economy, improves and modernizes California's energy infrastructure and maintains electric system reliability, maximizes additional environmental and economic co-benefits for California, and complements the state's efforts to improve air quality.

(i) It is the intent of the Legislature that the Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 continue its role in coordinating overall climate policy.

CHAPTER 3. Definitions

38505. For the purposes of this division, the following terms have the following meanings:

(a) "Allowance" means an authorization to emit, during a specified year, up to one ton of carbon dioxide equivalent.

(b) "Alternative compliance mechanism" means an action undertaken by a greenhouse gas emission source that achieves the equivalent reduction of greenhouse gas emissions over the same time period as a direct emission reduction, and that is approved by the state board. "Alternative compliance mechanism" includes, but is not limited to, a flexible compliance schedule, alternative control technology, a process change, or a product substitution.

(c) "Carbon dioxide equivalent" means the amount of carbon dioxide

by weight that would produce the same global warming impact as a given weight of another greenhouse gas, based on the best available science, including from the Intergovernmental Panel on Climate Change.

(d) "Cost-effective" or "cost-effectiveness" means the cost per unit of reduced emissions of greenhouse gases adjusted for its global warming potential.

(e) "Direct emission reduction" means a greenhouse gas emission reduction action made by a greenhouse gas emission source at that source.

(f) "Emissions reduction measure" means programs, measures, standards, and alternative compliance mechanisms authorized pursuant to this division, applicable to sources or categories of sources, that are designed to reduce emissions of greenhouse gases.

(g) "Greenhouse gas" or "greenhouse gases" includes all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexaflouride.

(h) "Greenhouse gas emissions limit" means an authorization, during a specified year, to emit up to a level of greenhouse gases specified by the state board, expressed in tons of carbon dioxide equivalents.

(i) "Greenhouse gas emission source" or "source" means any source, or category of sources, of greenhouse gas emissions whose emissions are at a level of significance, as determined by the state board, that its participation in the program established under this division will enable the state board to effectively reduce greenhouse gas emissions and monitor compliance with the statewide greenhouse gas emissions limit.

(j) "Leakage" means a reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state.

(k) "Market-based compliance mechanism" means either of the following:

(1) A system of market-based declining annual aggregate emissions limitations for sources or categories of sources that emit greenhouse gases.

(2) Greenhouse gas emissions exchanges, banking, credits, and other transactions, governed by rules and protocols established by the state board, that result in the same greenhouse gas emission reduction, over the same time period, as direct compliance with a greenhouse gas emission limit or emission reduction measure adopted by the state board pursuant to this division.

(l) "State board" means the State Air Resources Board.

(m) "Statewide greenhouse gas emissions" means the total annual emissions of greenhouse gases in the state, including all emissions of greenhouse gases from the generation of electricity delivered to and consumed in California, accounting for transmission and distribution line losses, whether the electricity is generated in state or imported. Statewide emissions shall be expressed in tons of carbon dioxide equivalents.

(n) "Statewide greenhouse gas emissions limit" or "statewide emissions limit" means the maximum allowable level of statewide greenhouse gas emissions in 2020, as determined by the state board pursuant to Part 3 (commencing with Section 38850).

CHAPTER 4. Role of State Board

38510. The State Air Resources Board is the state agency charged

with monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases.

PART 2. MANDATORY GREENHOUSE GAS EMISSIONS REPORTING

38530. (a) On or before January 1, 2008, the state board shall adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program.

(b) The regulations shall do all of the following:

(1) Require the monitoring and annual reporting of greenhouse gas emissions from greenhouse gas emission sources beginning with the sources or categories of sources that contribute the most to statewide emissions.

(2) Account for greenhouse gas emissions from all electricity consumed in the state, including transmission and distribution line losses from electricity generated within the state or imported from outside the state. This requirement applies to all retail sellers of electricity, including load-serving entities as defined in subdivision (j) of Section 380 of the Public Utilities Code and local publicly owned electric utilities as defined in Section 9604 of the Public Utilities Code.

(3) Where appropriate and to the maximum extent feasible, incorporate the standards and protocols developed by the California Climate Action Registry, established pursuant to Chapter 6 (commencing with Section 42800) of Part 4 of Division 26. Entities that voluntarily participated in the California Climate Action Registry prior to December 31, 2006, and have developed a greenhouse gas emission reporting program, shall not be required to significantly alter their reporting or verification program except as necessary to ensure that reporting is complete and verifiable for the purposes of compliance with this division as determined by the state board.

(4) Ensure rigorous and consistent accounting of emissions, and provide reporting tools and formats to ensure collection of necessary data.

(5) Ensure that greenhouse gas emission sources maintain comprehensive records of all reported greenhouse gas emissions.

(c) The state board shall do both of the following:

(1) Periodically review and update its emission reporting requirements, as necessary.

(2) Review existing and proposed international, federal, and state greenhouse gas emission reporting programs and make reasonable efforts to promote consistency among the programs established pursuant to this part and other programs, and to streamline reporting requirements on greenhouse gas emission sources.

PART 3. STATEWIDE GREENHOUSE GAS EMISSIONS LIMIT

38550. By January 1, 2008, the state board shall, after one or more public workshops, with public notice, and an opportunity for all interested parties to comment, determine what the statewide greenhouse gas emissions level was in 1990, and approve in a public hearing, a statewide greenhouse gas emissions limit that is equivalent to that level, to be achieved by 2020. In order to ensure the most accurate determination feasible, the state board shall

evaluate the best available scientific, technological, and economic information on greenhouse gas emissions to determine the 1990 level of greenhouse gas emissions.

38551. (a) The statewide greenhouse gas emissions limit shall remain in effect unless otherwise amended or repealed.

(b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020.

(c) The state board shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020.

PART 4. GREENHOUSE GAS EMISSIONS REDUCTIONS

38560. The state board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources, subject to the criteria and schedules set forth in this part.

38560.5. (a) On or before June 30, 2007, the state board shall publish and make available to the public a list of discrete early action greenhouse gas emission reduction measures that can be implemented prior to the measures and limits adopted pursuant to Section 38562.

(b) On or before January 1, 2010, the state board shall adopt regulations to implement the measures identified on the list published pursuant to subdivision (a).

(c) The regulations adopted by the state board pursuant to this section shall achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from those sources or categories of sources, in furtherance of achieving the statewide greenhouse gas emissions limit.

(d) The regulations adopted pursuant to this section shall be enforceable no later than January 1, 2010.

38561. (a) On or before January 1, 2009, the state board shall prepare and approve a scoping plan, as that term is understood by the state board, for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from sources or categories of sources of greenhouse gases by 2020 under this division. The state board shall consult with all state agencies with jurisdiction over sources of greenhouse gases, including the Public Utilities Commission and the State Energy Resources Conservation and Development Commission, on all elements of its plan that pertain to energy related matters including, but not limited to, electrical generation, load based-standards or requirements, the provision of reliable and affordable electrical service, petroleum refining, and statewide fuel supplies to ensure the greenhouse gas emissions reduction activities to be adopted and implemented by the state board are complementary, nonduplicative, and can be implemented in an efficient and cost-effective manner.

(b) The plan shall identify and make recommendations on direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives for sources and categories of sources that the state board finds are necessary or desirable to facilitate the achievement of the maximum feasible and cost-effective reductions of

greenhouse gas emissions by 2020.

(c) In making the determinations required by subdivision (b), the state board shall consider all relevant information pertaining to greenhouse gas emissions reduction programs in other states, localities, and nations, including the northeastern states of the United States, Canada, and the European Union.

(d) The state board shall evaluate the total potential costs and total potential economic and noneconomic benefits of the plan for reducing greenhouse gases to California's economy, environment, and public health, using the best available economic models, emission estimation techniques, and other scientific methods.

(e) In developing its plan, the state board shall take into account the relative contribution of each source or source category to statewide greenhouse gas emissions, and the potential for adverse effects on small businesses, and shall recommend a de minimis threshold of greenhouse gas emissions below which emission reduction requirements will not apply.

(f) In developing its plan, the state board shall identify opportunities for emission reductions measures from all verifiable and enforceable voluntary actions, including, but not limited to, carbon sequestration projects and best management practices.

(g) The state board shall conduct a series of public workshops to give interested parties an opportunity to comment on the plan. The state board shall conduct a portion of these workshops in regions of the state that have the most significant exposure to air pollutants, including, but not limited to, communities with minority populations, communities with low-income populations, or both.

(h) The state board shall update its plan for achieving the maximum technologically feasible and cost-effective reductions of greenhouse gas emissions at least once every five years.

38562. (a) On or before January 1, 2011, the state board shall adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit, to become operative beginning on January 1, 2012.

(b) In adopting regulations pursuant to this section and Part 5 (commencing with Section 38570), to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board shall do all of the following:

(1) Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.

(2) Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.

(3) Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.

(4) Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.

(5) Consider cost-effectiveness of these regulations.

(6) Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other

benefits to the economy, environment, and public health.

(7) Minimize the administrative burden of implementing and complying with these regulations.

(8) Minimize leakage.

(9) Consider the significance of the contribution of each source or category of sources to statewide emissions of greenhouse gases.

(c) In furtherance of achieving the statewide greenhouse gas emissions limit, by January 1, 2011, the state board may adopt a regulation that establishes a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions, applicable from January 1, 2012, to December 31, 2020, inclusive, that the state board determines will achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions, in the aggregate, from those sources or categories of sources.

(d) Any regulation adopted by the state board pursuant to this part or Part 5 (commencing with Section 38570) shall ensure all of the following:

(1) The greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable by the state board.

(2) For regulations pursuant to Part 5 (commencing with Section 38570), the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.

(3) If applicable, the greenhouse gas emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division.

(e) The state board shall rely upon the best available economic and scientific information and its assessment of existing and projected technological capabilities when adopting the regulations required by this section.

(f) The state board shall consult with the Public Utilities Commission in the development of the regulations as they affect electricity and natural gas providers in order to minimize duplicative or inconsistent regulatory requirements.

(g) After January 1, 2011, the state board may revise regulations adopted pursuant to this section and adopt additional regulations to further the provisions of this division.

38563. Nothing in this division restricts the state board from adopting greenhouse gas emission limits or emission reduction measures prior to January 1, 2011, imposing those limits or measures prior to January 1, 2012, or providing early reduction credit where appropriate.

38564. The state board shall consult with other states, and the federal government, and other nations to identify the most effective strategies and methods to reduce greenhouse gases, manage greenhouse gas control programs, and to facilitate the development of integrated and cost-effective regional, national, and international greenhouse gas reduction programs.

38565. The state board shall ensure that the greenhouse gas emission reduction rules, regulations, programs, mechanisms, and incentives under its jurisdiction, where applicable and to the extent feasible, direct public and private investment toward the most disadvantaged communities in California and provide an opportunity for small businesses, schools, affordable housing associations, and other community institutions to participate in and benefit from

statewide efforts to reduce greenhouse gas emissions.

PART 5. MARKET-BASED COMPLIANCE MECHANISMS

38570. (a) The state board may include in the regulations adopted pursuant to Section 38562 the use of market-based compliance mechanisms to comply with the regulations.

(b) Prior to the inclusion of any market-based compliance mechanism in the regulations, to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board shall do all of the following:

(1) Consider the potential for direct, indirect, and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution.

(2) Design any market-based compliance mechanism to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants.

(3) Maximize additional environmental and economic benefits for California, as appropriate.

(c) The state board shall adopt regulations governing how market-based compliance mechanisms may be used by regulated entities subject to greenhouse gas emission limits and mandatory emission reporting requirements to achieve compliance with their greenhouse gas emissions limits.

38571. The state board shall adopt methodologies for the quantification of voluntary greenhouse gas emission reductions. The state board shall adopt regulations to verify and enforce any voluntary greenhouse gas emission reductions that are authorized by the state board for use to comply with greenhouse gas emission limits established by the state board. The adoption of methodologies is exempt from the rulemaking provisions of the Administrative Procedure Act (Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code).

38574. Nothing in this part or Part 4 (commencing with Section 38560) confers any authority on the state board to alter any programs administered by other state agencies for the reduction of greenhouse gas emissions.

PART 6. ENFORCEMENT

38580. (a) The state board shall monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board pursuant to this division.

(b) (1) Any violation of any rule, regulation, order, emission limitation, emissions reduction measure, or other measure adopted by the state board pursuant to this division may be enjoined pursuant to Section 41513, and the violation is subject to those penalties set forth in Article 3 (commencing with Section 42400) of Chapter 4 of Part 4 of, and Chapter 1.5 (commencing with Section 43025) of Part 5 of, Division 26.

(2) Any violation of any rule, regulation, order, emission limitation, emissions reduction measure, or other measure adopted by the state board pursuant to this division shall be deemed to result in an emission of an air contaminant for the purposes of the penalty provisions of Article 3 (commencing with Section 42400) of Chapter 4

of Part 4 of, and Chapter 1.5 (commencing with Section 43025) of Part 5 of, Division 26.

(3) The state board may develop a method to convert a violation of any rule, regulation, order, emission limitation, or other emissions reduction measure adopted by the state board pursuant to this division into the number of days in violation, where appropriate, for the purposes of the penalty provisions of Article 3 (commencing with Section 42400) of Chapter 4 of Part 4 of, and Chapter 1.5 (commencing with Section 43025) of Part 5 of, Division 26.

(c) Section 42407 and subdivision (i) of Section 42410 shall not apply to this part.

PART 7. Miscellaneous Provisions

38590. If the regulations adopted pursuant to Section 43018.5 do not remain in effect, the state board shall implement alternative regulations to control mobile sources of greenhouse gas emissions to achieve equivalent or greater reductions.

38591. (a) The state board, by July 1, 2007, shall convene an environmental justice advisory committee, of at least three members, to advise it in developing the scoping plan pursuant to Section 38561 and any other pertinent matter in implementing this division. The advisory committee shall be comprised of representatives from communities in the state with the most significant exposure to air pollution, including, but not limited to, communities with minority populations or low-income populations, or both.

(b) The state board shall appoint the advisory committee members from nominations received from environmental justice organizations and community groups.

(c) The state board shall provide reasonable per diem for attendance at advisory committee meetings by advisory committee members from nonprofit organizations.

(d) The state board shall appoint an Economic and Technology Advancement Advisory Committee to advise the state board on activities that will facilitate investment in and implementation of technological research and development opportunities, including, but not limited to, identifying new technologies, research, demonstration projects, funding opportunities, developing state, national, and international partnerships and technology transfer opportunities, and identifying and assessing research and advanced technology investment and incentive opportunities that will assist in the reduction of greenhouse gas emissions. The committee may also advise the state board on state, regional, national, and international economic and technological developments related to greenhouse gas emission reductions.

38592. (a) All state agencies shall consider and implement strategies to reduce their greenhouse gas emissions.

(b) Nothing in this division shall relieve any person, entity, or public agency of compliance with other applicable federal, state, or local laws or regulations, including state air and water quality requirements, and other requirements for protecting public health or the environment.

38593. (a) Nothing in this division affects the authority of the Public Utilities Commission.

(b) Nothing in this division affects the obligation of an electrical corporation to provide customers with safe and reliable

electric service.

38594. Nothing in this division shall limit or expand the existing authority of any district, as defined in Section 39025.

38595. Nothing in this division shall preclude, prohibit, or restrict the construction of any new facility or the expansion of an existing facility subject to regulation under this division, if all applicable requirements are met and the facility is in compliance with regulations adopted pursuant to this division.

38596. The provisions of this division are severable. If any provision of this division or its application is held invalid, that invalidity shall not affect other provisions or applications that can be given effect without the invalid provision or application.

38597. The state board may adopt by regulation, after a public workshop, a schedule of fees to be paid by the sources of greenhouse gas emissions regulated pursuant to this division, consistent with Section 57001. The revenues collected pursuant to this section, shall be deposited into the Air Pollution Control Fund and are available upon appropriation, by the Legislature, for purposes of carrying out this division.

38598. (a) Nothing in this division shall limit the existing authority of a state entity to adopt and implement greenhouse gas emissions reduction measures.

(b) Nothing in this division shall relieve any state entity of its legal obligations to comply with existing law or regulation.

38599. (a) In the event of extraordinary circumstances, catastrophic events, or threat of significant economic harm, the Governor may adjust the applicable deadlines for individual regulations, or for the state in the aggregate, to the earliest feasible date after that deadline.

(b) The adjustment period may not exceed one year unless the Governor makes an additional adjustment pursuant to subdivision (a).

(c) Nothing in this section affects the powers and duties established in the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code).

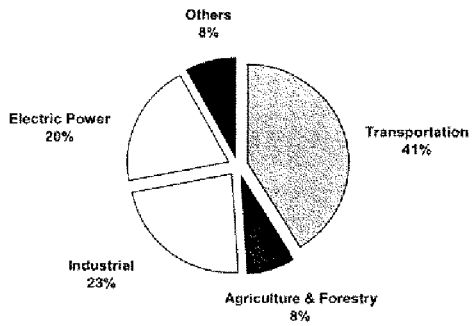
(d) The Governor shall, within 10 days of invoking subdivision (a), provide written notification to the Legislature of the action undertaken.

SEC. 2 No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

GREENHOUSE GAS EMISSIONS

BACKGROUND

The term "greenhouse gas emissions" (GHG emissions) is defined in AB 32 as carbon dioxide, nitrous oxide, methane, hydroflurocarbons (HFCs), perflurocarbons (PFCs), and sulfur hexafluoride (SF_6) that when allowed to build up in the atmosphere cause a rise in the average temperature of the earth's surface. In California, 40% of our GHG pollution comes from our 26 million motor vehicles and other mobile sources. Over 80% comes from fossil fuel combustion[1].



The potential adverse consequences of climate change from GHG emissions are globally significant, and recent studies predict major statewide impacts. A 2004 study, published by the Union of Concerned Scientists, includes modeling data showing that, if there are no further controls on the GHG emission, California's summer temperatures could increase by as much as ten degrees annually in the Central Valley and other parts of the state by the end of the century. For example, a ten-degree increase in summer in the Sacramento Valley would have profound impacts on the environment and economy of the region.

Last year, under the leadership of Speaker Núñez, the Legislature passed, and the Governor signed, Assembly Bill 32 (Núñez), the California Global Warming Solutions Act of 2006. AB 32 establishes the first-in-the-world comprehensive program to regulate and achieve real, quantifiable and cost-effective reductions to GHG emissions that will reduce GHG emissions 25% by 2020. It establishes a mandatory reporting system to track and monitor GHG emission levels and institutes a limit on GHG emissions – requiring emission reductions to 1990 levels by the year 2020.

[1] From the California Energy Commission's "Inventory of California Greenhouse Gas Emissions and Sinks: 1990-2004", December 2006 and the California Department of Motor Vehicles Website.

GREENHOUSE GAS EMISSIONS

SCOPE OF AB 32

The scope of AB 32 is sweeping. It authorizes the State Air Resources Board (ARB) to regulate every source of GHG emissions in California (industrial, vehicular, fuel-related, etc.)

AB 32 TIMEFRAME

The timeframe for AB 32 is the next two decades plus. The bill requires ARB to set the 1990 baseline as well as requires that statewide, aggregate GHG emissions be reduced to that baseline by 2020. After 2020, the bill directs ARB to recommend strategies to the Legislature for continued reductions in GHGs.

TIMELINE OF ARB ACTIONS UNDER AB 32:

	(Legal requirements) *(Related events)*
On Jan 1, 2007	*Statewide GHG emission inventory transfers from the California Energy Commission to ARB pursuant to budget trailer bill language.*
By July 1, 2007	**ARB forms the Environmental Justice Advisory Committee and Economic and Technology Advancement Advisory Committee.**
By July 1, 2007	**ARB adopts list of discrete early action measures in open public hearing.** *ARB considers low carbon fuel standard for inclusion pursuant to the Governor's Executive Order.*
By July 1, 2007	*The California Environmental Protection Agency (CalEPA) Market Advisory Committee issues report and recommendations to ARB for its consideration, pursuant to the Governor's Executive Order.*
By Jan 1, 2008	**ARB adopts regulations for mandatory emissions reporting, and confirms 1990 baseline for statewide emissions which becomes legal target for 2020.**
Spring 2008	*Administration's Climate Action Team updates climate action plan for reducing GHGs across state government, pursuant to the Governor's Executive Order. ARB draft plan released at same time.*
By Jan 1, 2009	**ARB adopts comprehensive scoping plan indicating how total emission reductions will be achieved.**
By Jan 1, 2010	**ARB's early action measures fully enforceable.**
By Jan 1, 2011	**ARB completes major rulemakings to reduce GHGs, including market measures. After January 1, 2011, ARB may revise its rules or adopt new rules in furtherance of the 2020 emissions cap.**
Jan 1, 2012	**Deadline for enforcing remaining ARB major rulemakings.**
Dec 31, 2020	**Deadline for achieving 2020 GHG emissions cap.**

GREENHOUSE GAS EMISSIONS

AB 32 PROCESS

AB 32 directs the ARB to adopt a comprehensive "scoping" plan by January 1, 2009, for achieving the necessary GHG reductions. ARB then must complete all major regulatory rulemakings by January 1, 2012. To ensure interim progress, ARB is required to propose discrete early action measures by July 2007 and enforce them no later than January 1, 2010.

AB 32 INTER-AGENCY COORDINATION

Under AB 32, ARB is explicitly required to work with the Public Utilities Commission and the Energy Commission on energy-related strategies and with the Climate Action Registry on emission calculation protocols. AB 32 allows the ARB to coordinate with all other state and local agencies in their work on climate change. The coordination of statewide efforts will be headed by the Cal EPA Secretary.

ADVISORY BODIES

AB 32 requires the ARB to appoint two advisory committees to assist the ARB in implementation: Environmental Justice and Economic and Technology Advancement. Both committees' memberships were announced on January 25, 2007. The Environmental Justice Advisory Committee plans to have their first meeting in February 2007. The Economic and Technology Advancement Advisory Committee plans to have their first meeting in March 2007.

FUNDING

The funding under AB 32 is discretionary. The bill authorizes, but does not require, ARB to levy fees on GHG sources that are regulated under the bill.

For Fiscal Year 2007-08, the Governor proposes $24.4 million and 101 positions for the first full year implementation of AB 32. Additionally, the Governor proposes $11.4 million and 25 positions to further the Administration's Climate Action Team GHG reduction goals.

RULEMAKING CONDITIONS

AB 32 sets out a number of conditions under which ARB must comply with. For every rule, ARB must to the extent feasible:

- Maximize benefits;
- Minimize cost and administration burdens;
- Ensure electric system reliability;
- Prevent leakage to other states;
- Avoid backsliding on other pollutant controls;
- Avoid disproportionate effects in low income communities; and,
- Confirm feasibility

For any market measures considered, ARB must also ensure those measures are verifiable and enforceable, and equivalent to or better than direct regulation.

GREENHOUSE GAS EMISSIONS

RELATED ENACTED LEGISLATION AND ACTIVITIES

- In 2001, the State established the California Climate Action Registry as a non-profit voluntary registry for GHG emissions. The purpose of the Registry is to assist companies and organizations to establish GHG emission baselines against which any future GHG emission reduction requirements may be applied. Under current law, the Registry will sunset at the end of 2007. Under AB 32, the ARB is required to incorporate the standards and protocols developed by the Registry into the state's mandatory GHG emissions reporting program to the maximum extent feasible.

- In 2002, Governor Davis signed AB 1493 (Pavley), which required the ARB, by 2005, to adopt regulations to reduce the GHG emissions by motor vehicles. The new regulations that require automakers to begin selling vehicles with reduced GHG emissions by model year 2009 was adopted by the ARB in September 2004. In the last two years, nine automakers (Ford, General Motors, Toyota, DaimlerChrysler, BMW, Mazda, Mitsubishi Motors, Porsche and Volkswagen) have filed suit against the State of California to block AB 1493. This lawsuit is on hold until the US Supreme Court decides *Massachusetts v. EPA* (see description below).

- On December 6, 2004, the California Public Utilities Commission adopted an important new global warming policy, which requires the state's largest electric utilities to begin accounting explicitly for the financial risk associated with GHG emissions when making new long-term power plant investments, and in developing long-term resource plans.

- In 2006, Governor Schwarzenegger signed SB 1368 (Perata) which requires the California Energy Commission to develop and adopt by regulation a GHG emissions performance standard applicable to "baseload" generation resources seeking extended access to California markets. These are the workhorse power plants that are designed to meet electricity needs around the clock. The new standard prohibits any more long-term investment in these facilities unless their air emissions are as low, or lower, than emissions from a clean and efficient natural gas power plant.[2]

- In November 2006, the Natural Resources Defense Council (NRDC) and a coalition of states and environmental organizations went before the Supreme Court of the United States as it heard *Massachusetts v. EPA*, in what some environmental groups are calling the most significant environmental case in decades. The question before the court: Are the emissions that cause global warming "air pollutants" under the Clean Air Act? The case will determine whether the US EPA has the authority to regulate carbon dioxide from motor vehicles. A decision is expected by mid-summer.[3]

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[2] Natural Resources Defense Council Website, September 2006
[3] Natural Resources Defense Council Website, November 2006

GREENHOUSE GAS EMISSIONS

MAJOR GREENHOUSE GAS EMISSION MARKETS

- **European Climate Exchange** (ECX) is a carbon emissions trading platform for sellers and buyers of emission reduction credits established by European National Registries. Their website is: www.europeanclimateexchange.com

- **Chicago Climate Exchange** (CCX) is a voluntary but legally binding association committing its North American members to reduce their GHG emissions below the member's baseline. Their website is: www.chicagoclimatex.com

- **The Regional Greenhouse Gas Initiative (RGGI or "ReGGIe")** is a cooperative effort by nine Northeast and Mid-Atlantic states to discuss the design of a regional cap-and-trade program initially covering carbon dioxide emissions from power plants in the region. In the future, RGGI may be extended to include other sources of GHG emissions, and greenhouse gases other than CO2. Their website is: www.rggi.org

ADDITIONAL RESOURCES

- **California State Government Climate Change Portal** http://www.climatechange.ca.gov/

- **Federal Legislation on Climate Change**
  - S. 556 "Clean Power Act of 2001" - http://thomas.loc.gov/cgi-bin/query/z?c107:S.556:
  - H.R. 1256 "Clean Smokestacks Act of 2001" - http://thomas.loc.gov/cgi-bin/query/z?c107:H.R.1256:
  - S. 1766 "Energy Policy Act of 2002" - http://thomas.loc.gov/cgi-bin/query/z?c107:S.1766:
  - H.R. 4 "Energy Policy Act of 2002" - http://thomas.loc.gov/cgi-bin/bdquerytr/z?d107:HR00004:
  - H.R. 6 "CLEAN Energy Act of 2007" - http://thomas.loc.gov/cgi-bin/query/D?c110:2:./temp/~c1102Nw1Tv:

CLIMATE CHANGE ORGANIZATIONS

- Bluewater Network (bluewaternetwork.org)
- Climate Ark (www.climateark.org)
- The Climate Group (www.theclimategroup.org)
- Energy Foundation (www.ef.org)
- Natural Resources Defense Council (www.nrdc.org)
- Pew Center on Global Climate Change (www.pewclimate.org)
- Union of Concerned Scientists (www.ucsusa.org)

RESPONSES FROM FABIAN NUÑEZ TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. I am shocked that you would divert your State's economic resources toward reducing greenhouse gases when California is the dirtiest air pollution State in the Nation. Thousands of people die in your State every year because California has refused to take the actions necessary to meet existing laws. The elderly, those with children and anyone with respiratory problems should be outraged you would choose to make this symbolic measure more important than their health, their very lives. How do you respond to this statement?

Response. The Senator's "shock" is misplaced. California has some of the strongest air pollution laws in the Nation, yet there are areas of our state where topography, traffic congestion, and concentrations of specific industries do continue to present air quality issues. As a response, last year the California Legislature worked in a bipartisan fashion with Governor Arnold Schwarzenegger to pass not only AB 32 to address global warming, but also to put over $40 billion of transportation, flood protection, parks and affordable hosing bonds before the voters. Embedded within each of these bonds are specific provisions to address a variety of environmental issues, particularly air quality issues. For example, within the transportation bond there is over $1 billion dedicated to address air quality issues. The bonds also commit billions of dollars to such air quality measures as alternative fuels, new/advanced technologies to move goods through California's ports, traffic congestion issues, and clean construction equipment and school buses as well as transit orientated development, urban infill housing, land conservation and proper land use planning. Additionally, in terms of fighting global warming, the American Lung Association notes that several studies have shown that increased emissions of air contaminants, higher temperatures and the increased smog that accompanies higher temperatures make many health conditions worse. Warmer temperatures would also increase the likelihood of increased wildfires along with the carbon dioxide and particulates they produce. Rather than the "outrage" Senator Inhofe calls for, all these actions have proven to be popular with the people of California.

Question 2. What is the estimated impact on global temperature that AB 32 will have over the bill's lifetime?

Response. If, as I expressed my hope for during my testimony before the committee, AB 32 is replicated in other states and by the Federal Government, I believe the global impact of AB 32 will indeed be significant. As you must know, AB 32 is just one step toward the ultimate goal of having the United States working with the global community to reduce greenhouse gas emissions and therefore global temperatures. Through AB 32's mandated requirements, California will reduce its greenhouse gases by 25 percent to 1990 levels, roughly 174 million metric tons. Even the most committed global warming denier has to acknowledge the significance of that reduction.

Senator BOXER. Thank you so much, Speaker.

The Republican side has asked if we could break up the, let us just say, pro-action side of this debate. I think they are right, I think they are fair. So we are going to have the Hon. Dennis Adkins, Chairman of the House Committee on Energy and Technology, Oklahoma State House, go next, and after him, the Hon. Ted Harvey, Senator, Colorado State Senate, if that is OK.

So the Hon. Mr. Adkins.

STATEMENT OF DENNIS ADKINS, CHAIRMAN, HOUSE COMMITTEE ON ENERGY AND TECHNOLOGY, OKLAHOMA STATE HOUSE

Mr. ADKINS. Thank you, Madam Chair, Ranking Member Inhofe and members of the Environment and Public Works Committee.

I am Dennis Adkins and I am from the great State of Oklahoma, representing District 75, which includes parts of Tulsa and Broken Arrow in Oklahoma. I also serve as the Energy and Technology Chairman for the State of Oklahoma in the House, and I have served in that capacity since 2005.

The Committee on Energy and Technology has jurisdiction on all State legislation affecting oil and gas, and it also has utility regula-

tion under its jurisdiction. Oklahoma is an energy State. We have 10 percent of this Nation's proven reserves of natural gas. The oil and gas industry as a whole in Oklahoma has produced energy valued in excess of $10 billion for the past 2 years, representing more than 10 percent of our gross State product.

During the past 15 years, Oklahoma's oil and natural gas producers have paid a gross production tax of more than $400 million annually. In this most recent fiscal year, that figure was increased to $1 billion. This tax revenue from the energy industry funds our schools, roads, bridges, health care and other vital State services. No other industry in Oklahoma provides such a significant portion of the State's resources.

Additionally, the energy sector employs 55,000 Oklahomans. In the past 24 months, this industry has created 4,000 new jobs. Oil and gas in Oklahoma is important and the salaries double for the Oklahoma workers if they are in the oil and gas industry.

In electricity generation, Oklahomans heavily rely on coal and natural gas. Roughly 56 percent of the total electric generation is coal-based and roughly 38 percent is from natural gas-based generation, with a growing wind power sector as well. These percentages of electricity generation, of course, can and do vary greatly from State to State. For example, hydroelectric and nuclear resources can be and are reliable in other parts of the Nation.

Like the rest of the Country, we in Oklahoma see many scientific, Government and media reports about climate change. We are interested in knowing the facts, also.

I am not a scientist by profession, but I do intend to testify from this perspective. I am a State legislator and I believe that my job is to pass legislation to deal with problems facing my State based on the best available information. Therefore, I am greatly concerned by one fact. That fact is that there does not seem to be an agreement on climate change, and yet there does seem to be a great rush to action.

The States represented here today can capably comment on what their States are doing or what their States are doing in conjunction with other States to address greenhouse gas emission controls. The representatives from these States certainly understand their State's energy profiles, needs and economic impacts better than I do. Instead of me describing what California does or doesn't do or what the Regional Greenhouse Gas Initiative in the northeast may or may not be doing right or wrong, it is better for me to describe what I think States like Oklahoma will be concerned about as any legislation addressing climate change is considered.

Senator BOXER. Sir, could you try to wrap up with your most important thing, because we only have 20 seconds left on your time.

Mr. ADKINS. Sure. Our own Senator Inhofe is a national leader, especially on issues like climate change. I understand that he has said that carbon cap proposals would be the largest single tax increase to date, costing the American public more than $300 billion. However, regardless of the investments in renewable fuels, renewables can only provide a small part of the U.S. electric power. Oklahomans realize that we need a diversified energy supply, such as clean coal, natural gas and renewable sources.

I appreciate the opportunity to testify before the committee, and I appreciate the committee allowing a representative from an energy State to come and testify. Thank you.

[The prepared statement of Mr. Adkins follows:]

STATEMENT OF DENNIS ADKINS, CHAIRMAN, HOUSE COMMITTEE ON ENERGY AND TECHNOLOGY, OKLAHOMA STATE HOUSE

Good morning, Madam Chairman, Ranking Member Inhofe, and Members of the Environment and Public Works Committee. I am Dennis Adkins, and I am an Oklahoma State Representative for District 75 that includes parts of the cities of Tulsa and Broken Arrow, Oklahoma. I am also the chairman of the Oklahoma House Committee on Energy and Technology and have served in that capacity since 2005. The Committee on Energy and Technology has jurisdiction on all state legislation affecting the oil and gas industry in Oklahoma and utility regulation. In addition to serving in the state legislature, I am involved in the American Legislative Exchange Council (ALEC) and the Energy Council. Both ALEC and the Energy Council are organizations comprised of state legislators from throughout the country.

Oklahoma is an energy state. We have 10 percent of this Nation's proven reserves of natural gas. The oil and gas industry as a whole in Oklahoma has produced energy valued in excess of $10 billion for the past 2 years representing more than 10 percent of our gross state product. During the past 15 years, Oklahoma's oil and natural gas producers have paid gross production taxes averaging more than $400 million annually, and in the most recent fiscal year that figure increased to $1 billion. This tax revenue from the energy industry funds schools, roads, health care and other vital state services. No other industry in Oklahoma provides such a significant portion of the state's revenue sources.

Additionally, the energy sector employs more than 55,000 Oklahomans. In the past 24 months, this industry has created more than 4,000 jobs. Oil and natural gas workers are paid more than double the average salary for Oklahoma workers.

In electricity generation, Oklahoman's heavily rely on coal and natural gas. Roughly 56 percent of total electricity generation is coal based followed by roughly 38 percent of natural gas based generation with a growing wind power sector as well. These percentages of electricity generation sources, of course, can and do vary greatly state to state as, for example, hydroelectric and nuclear sources are very viable in certain other parts of the nation.

Like the rest of the country, we in Oklahoma see the many scientific, government, and media reports on climate change, and we are interested in knowing the facts.

Respected people on both sides of the issue present seemingly very compelling facts about their particular point of view.

I am not a scientist by profession, and do not intend to testify from that perspective. I am a state legislator. I believe it is my job to work to pass legislation to deal with problems facing my state based on the best available information and facts. Therefore, I am greatly concerned by one clear fact. That fact is that there does not seem to be agreement on the issue of climate change, and yet there seems to be a great rush to action.

Without the facts, I think it would be very possible to pass federal legislation or legislation in the states that might cost people substantially. I do not wish to be misunderstood and simply labeled as a naysayer, but a rush to pass legislation addressing climate change may make it appear that we, as elected officials, are doing something to address a problem, but in reality, not accomplish anything meaningful toward solving climate change. I understand that even if all industrialized nations would have faithfully followed the caps implemented by the Kyoto Protocol, the result would only shave a fraction of a degree Celsius of earth's temperatures. After all, what we are principally talking about is controlling carbon dioxide emissions. However, this gas is non-toxic to humans. It does not impair visibility. It does not foul the air we breathe, neither does it cause respiratory diseases, all of which hardly are characteristics of a bona fide pollutant. In fact, I have even heard it argued that moderate warming from 0.5 to 1.5 degree Celsius might enhance agricultural productivity, which is also extremely important to my state and other states like Oklahoma.

We already have seen at least a couple of examples of what states have developed or enacted into state law addressing greenhouse gas emissions. With Assembly Bill 32, the California Global Warming Solutions Act of 2006, California will require monitoring and annual reporting from the state's most significant contributors to greenhouse gas emissions. The legislation seeks to reduce carbon dioxide emissions to 1990 levels by 2020 and achieve additional reductions into the future. The Re-

gional Greenhouse Gas Initiative (RGGI), an agreement among some Northeastern states, seeks to develop a northeastern regional cap and trade program covering carbon dioxide emissions from powerplants in that region, placing a cap on current carbon dioxide levels, and reducing carbon dioxide emissions levels by 10 percent by 2019.

The States represented here today will capably comment on what their state is doing or what their state is doing in conjunction with other states to address greenhouse gas emission controls. The representatives from these states certainly understand their states' energy profiles, needs, and economic impacts perhaps better than I would. Instead of me describing what California and what states in the Regional Greenhouse Gas Initiative in the northeast may have done wrong or right, which may simply be my opinion, perhaps it would be more productive to use my time to describe what I think a state like Oklahoma will be concerned about as any legislation addressing climate change is considered.

First and foremost, we would be concerned about the impact on Oklahomans. We would want to carefully weigh the proposed benefits of any action to the impact it will have on our citizens' pocketbooks, our economy, as well as on the environment.

Oklahoma is blessed to have an abundant supply of electricity at rates below the national average. Unfortunately, we are not as blessed when it comes to cool summers. Oklahoma can get hot in the summertime driving up power consumption as a result and that translates into high electric bills. I know because I hear from my constituents, and I am a ratepayer too.

Frankly, while I am aware of polling that suggests that many Americans are concerned about climate change, I am not sure they have calculated the impact the cost of addressing it will have on them.

As state and federal legislators, we all heard the public uproar when the cost of gasoline began climbing. A few winters ago, we heard loud and clear that citizens were not at all pleased with the increase in natural gas prices. Now, we are talking about taking steps that could drive energy prices even higher without a clearly articulated benefit.

I suppose the easy thing to do would be to pass legislation federally or in the states to attempt to address climate change. But if we do, absent the facts surrounding the cost and benefit, I do not believe we have served our constituents very well.

If I have ever heard of an issue that needs more comprehensive study, climate change is it. I think our nation is poised to make massive investment on the backs of consumers, not knowing if the proper technology even exists and if those investments will even help.

Generally speaking, measures such as carbon caps, cap and trade systems, and emission allowances would inevitably raise energy prices, raise costs of consumer products and services, reduce profits, impair productivity and may not achieve global reductions of greenhouse gas emissions. For example, under the Kyoto Protocol, emissions reductions are imposed on developed countries, while developing countries such as India and China, which will ultimately surpass the United States in carbon dioxide emissions, are left out.

I have read forecasts estimating various costs from compliance with carbon dioxide caps. For instance, I have read that implementing the Kyoto Protocol would have cost the entire U.S. economy over $300 billion by 2010 and implementing the standards in Kyoto would have resulted in an annual lost of nearly $3,000 per household by 2010. Information published by the U.S. Energy Information Administration estimated that cutting carbon emissions five percent below 1990 levels, as required in the Kyoto Protocol, would have reduced the U.S. Gross Domestic Product to up to $340 billion by 2012 which it estimated would translate into a cost of $4,500 for every family of four. There have been many proposals circulating in Congress for the past number of years, and they all address greenhouse gas emission reductions from various industrial sectors in various manners. I am not going to pretend to be an expert on each proposal and their forecasted reductions and costs. However, what they all seemingly have in common are substantially increased energy costs for consumers.

Our own Senator Inhofe, who is a national leader especially on the issue of climate change, I understand has said that carbon cap proposals would be the largest single tax increase to date costing the American public $300 billion annually.

Does that mean we in Oklahoma are simply taking the posture of standing still in the meantime, of course not.

In Oklahoma, for example, our utilities are becoming leaders in wind power. Without mandates, our state has over 500 megaWatts of wind power. Although I realize this falls behind larger states that have developed their infrastructure over a longer period of time, over the last three years, Oklahoma now has the fifth largest wind

generation base in the country. In fact, as transmission costs climb to $1 million per mile, our largest problem is transmission of this energy from the western portion of the state throughout the rest state.

Pending in the Oklahoma Legislature presently is a measure that will establish the Oklahoma Bio-fuels Center over the next four years. Oklahoma will invest $40 million in a consortium among the University of Oklahoma, Oklahoma State University, and the Noble Foundation to engage in research developing the bio-fuels sector focusing on cellulosic feedstock.

At the same time, while the majority of the electricity capacity in Oklahoma is natural gas fired at roughly 58 percent, I know the utility sector is presently investing in building a new coal-fired plant in the central part of the state, and they are going above and beyond the standard technology. We are planning to build a cutting edge plant that will reduce greenhouse gases and other emissions.

However, regardless of the investments in renewable fuels, renewables continue only to provide a small part of the total U.S. electric power. Oklahomans realize we need a diverse energy supply making use of clean coal, natural gas, and renewable sources with limited constraints on development and economic impacts.

I appreciate the opportunity to testify before the committee this morning and appreciate this committee allowing a representative from an energy state like Oklahoma to share their views.

Thank you.

Senator BOXER. Thank you very much.

The Hon. Ted Harvey, Senator, Colorado State Senate.

STATEMENT OF HON. TED HARVEY, SENATOR, COLORADO STATE SENATE

Mr. HARVEY. Thank you, Madam Chair, and thank you to the committee for having me here today. It is an honor to be here.

My name is Ted Harvey and I currently serve in the Colorado State Senate. For the last 6 years, I have served on the Agricultural, Natural Resource and Energy committees in the House and now in the State Senate. Additionally, I have a master's degree in public administration, with a concentration in environmental policy and law.

As you are aware, there are many academic specialties in the field of environmental sciences. Trying to get the experts to agree on anything is almost impossible. The debate over global warming change is no different, and the debate has been going on for almost 100 years. "Geologists think the world may be frozen again," this was the headline in the New York Times on February 24, 1885. On January 2, 1939, an article claimed the earth was warming again. On April 28, 1975, Newsweek published an article entitled "The Cooling World." Indeed, the temperature of the earth's climate had been falling for 30 years, according to Newsweek's 1975 article. Climatologists everywhere were offering doomsday scenarios if public policymakers such as yourself did not act quickly.

Yet only 13 years later, in 1988, a NASA scientist testified before Congress that global warming was in effect and was serious. Thus began the current debate on global warming. Since 1988, studies on the cause of the current increase in the temperature of the earth's climate have resulted in contradictory conclusions regarding man's involvement. Scientists and politicians alike are using these findings to pursue their own political and geo-economic agendas.

In his documentary, "An Inconvenient Truth," Vice President Al Gore argues that unless we do something about CO_2 emissions, much of Greenland's ice will melt into the ocean, rising sea levels over 20 feet by the year 2100. This is a serious claim. The U.N.'s Intergovernmental Panel on Climate Change, the IPCC, recently

released the summary for policymakers, that you all received, that predicts a rise in sea level between 8 and 17 inches. There is a big difference between 20 feet and 17 inches.

Research following the IPCC's climate change 2100, the scientific basis, reveals that much of their conclusions have been called into question or totally disproved, specifically, the famous hockey stick graph that was the basis for much of the Gore movie and the Kyoto Protocol. In fact, just this month, Science magazine published an article stating that the recent loss of Greenland's glaciers has reversed.

Over the last 40 years, this body has encouraged the development of new technology that is clean, renewable and economically viable. For example, through technology, competition and scientifically sound regulation, Colorado has made tremendous strides in cleaning its environment. Denver is no longer known for its brown cloud. In fact, one might argue that our air is as clean as it was in 1893, when America the Beautiful was written from the top of our very own Pike's Peak.

Colorado very proudly leads the world in the development of clean technology from power generation. The National Renewable Energy Laboratory, NREL, is located in Colorado and is pioneering this new frontier.

On the eastern plains, our spacious skies have winds strong enough to sustain large wind farms. Colorado was on the cutting edge of this new development. Our eastern plains are blanketed with miles of amber waves of corn, and we are using this resource to develop ethanol in impressive quantities. Colorado's purple mountain majesties are covered by pine forests that are being decimated by pine beetles. In true western ingenuity, we see this problem as an opportunity to reinvigorate a once-dying lumber industry, using these dead stands as biomass and biofuel, another renewable energy source.

Finally, Colorado is known for its blue skies and over 300 annual days of sunshine. NREL is capitalizing on our environment to develop the next generation of solar technologies. The United States of America is the greatest Nation on the face of the earth. Through Government policies that encourage ingenuity and responsibility, our free market system has brought forth environmental advancements that man could have only dreamt of 40 years ago.

To impede innovation and dictate policy through draconian regulation would only harm our economy and endanger our Nation's competitiveness and security. I pray the Lord will give you wisdom as you deliberate the interests of our Country, and may God shed His grace on thee.

Thank you for your time.

[The prepared statement of Mr. Harvey follows:]

STATEMENT OF HON. TED HARVEY, SENATOR, COLORADO STATE SENATE

Thank you Madam Chair and thank you committee for having me here today.

My name is Ted Harvey, and I currently serve in the Colorado State Senate. For the last 6 years I've served on the Agriculture, Natural Resource and Energy Committee. Additionally, I have a master's degree in public administration with a concentration in environmental law and policy.

As you are aware there are many academic specialties in the field of environmental sciences. Trying to get the experts to agree on anything is almost impossible.

The debate over global climate change is no different. The debate has been going on for almost 100 years.

"Geologists think the world may be frozen again." This was the headline in the New York Times on February 24, 1885.

A January 2, 1939 article claimed the earth was growing warmer.

On April 28, 1975, Newsweek published an article entitled "The Cooling World."

Indeed the temperature of the earth's climate had been falling for 30 years prior to Newsweek's 1975 article. Climatologists everywhere were offering doomsday scenarios if public policy makers did not act quickly.

Yet, only 13 years later in 1988, a NASA scientist testified before Congress that global warming was in effect and was serious . . . and thus began our current debate on global warming.

Since 1988 studies on the cause of the current increase in temperature of the earth's climate have resulted in contradictory conclusions regarding man's involvement. Scientists and politicians alike are using these findings to pursue their own political or geo-economic agendas.

In his documentary An Inconvenient Truth, Vice President Al Gore argues that unless we do something about CO_2 emissions much of Greenland's ice will melt into the ocean, raising sea levels over 20 feet by the year 2100. This is a serious claim. Where did he get his data?

The UN's Intergovernmental Panel on Climate Change (IPCC) recently released their Summary for Policy Makers that predicts a rise in sea level between 8 and 17 inches by 2100. There is a big difference between 17 inches and 20 ft.

Research following the IPCC's Climate Change 2001: The Scientific Basis reveals that many of their conclusions have been called into question or totally disproved—specifically, the famous "hockey stick" graph that was the basis for much of the Gore movie and the Kyoto Protocols.

In fact, just this month Science Magazine published an article stating the recent loss of Greenland's glaciers has reversed!

Over the last 40 years Congress has encouraged the development of new technology that is clean, renewable and economically viable. For example, through technology, competition and scientifically sound regulation, Colorado has made tremendous strides in cleaning its environment. Denver is no longer known for its brown cloud. In fact, one might argue that our air is as clean as it was in 1893 when "America the Beautiful" was written from atop our very own Pikes Peak.

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To impede innovation and dictate policy through draconian regulation would only harm our economy and endanger our Nation's competitiveness and security.

I pray that Lord will give you wisdom as you deliberate the interests of our country and may God shed his grace, on thee. . . . Thank you for your time.

Senator BOXER. I pray we do something about global warming. God is testing us, that is for sure.

The Mayor of Seattle.

STATEMENT OF HON. GREG NICKELS, MAYOR, CITY OF SEATTLE, WA

Mayor NICKELS. Thank you, Madam Chair and members of the committee. As the others have observed, it is an honor to be here

and a pleasure to be able to talk about this important issue. I want to thank Senator Cantwell for her kind introduction.

It is also a pleasure to be in front of the committee with three former mayors sitting on the committee, because I know we are in good hands.

I am here today representing the 600,000 people of Seattle, and as co-chair of the U.S. Conference of Mayors' Climate Protection Council. I have submitted longer comments for the record, but I will keep my remarks before the committee brief this morning. Five years ago, when I became Mayor of Seattle, I was like a lot of people in this Country. I knew about global warming, I thought it was a serious problem, but I thought it was a long way away and far into the future.

The "aha" moment for me came during the winter of 2004 and 2005, which in the Cascade Mountains was a winter without snow. That is a bad thing. There was no ski season, and of course, that is a tragedy in and of itself. But for Seattle, we rely on that snow for our water and for our hydroelectric power. We have century-old systems, sustainable systems that captures that snow melt and turns it into drinking water and into very clean power.

As I got weekly reports from my directors of water and power, it became clear that global warming was not a distant threat and it was not far in the future: it was happening today and it was happening in our community. In fact, according to the University of Washington's climate impact group, the average snow pack in the Cascade mountains has declined by about 30 percent since the end of World War II and even more in some of the lower elevation areas that we rely on for our water and our power.

That winter, of course, the Kyoto Protocol went into effect in 141 countries but not in the United States. I was frustrated by the lack of action by our Country at the Federal level, so I pledged that Seattle would take local action to meet or exceed the reductions set by the Kyoto Protocol, specifically 7 percent reduction by the year 2012. But I also realized that if Seattle did this alone, as Senator Craig pointed out, it would be purely a symbolic gesture, it would mean very little.

So I challenged other mayors around the Country to join with me in this effort, and as of today 409 mayors have signed onto the U.S. Mayors Climate Protection Agreement and each and every one of them has pledged to take local action to reduce global warming pollution. Just to put that into perspective, if we were a country we would be slightly larger than the population of Italy, we would be equal to the population of the United Kingdom and we are catching up on France. These are mayors who are Democrats, Republicans and Independents. They are leaders of some of our largest cities, New York and Los Angeles and Chicago and Philadelphia and some of our smaller cities as well. They range from Boozman, MT to Akron, OH, from Belleview, NE to Burlington, VT, and Cleveland, OH, to Des Moines, IA.

We are very much not a symbolic effort. You have not 50 laboratories, you have 409 laboratories that are working to find creative ways to reduce greenhouse gas emissions.

I pulled together community leaders in Seattle to figure out what we could do to reduce our emissions by 680,000 tons, which would

be equivalent to that 7 percent. We are building our first light rail system. The cruise ships that visit our port plug into shore power, instead of running their diesel engines when they are in our city. We have among the most energy efficient green buildings of any city in the United States, and we are encouraging more and more people to give up long commutes and live instead in the heart of our city.

Our publicly owned electric utility, Seattle City Light, is the first major power supplier in the Country to be greenhouse gas neutral. We literally are powering our city without toasting the planet. But we have a much bigger challenge ahead of us, Madam Chair, and I want to just suggest three things——

Senator BOXER. If you do it quickly.

Mayor NICKELS [continuing]. That I would like this committee to face. One, like California, we believe a strong cap on emissions is necessary, 80 percent by the year 2050, we see as supported by science. Second, we believe that a cap and trade system will encourage markets to behave in a way that will reduce greenhouse gas emissions. Those are top down approaches that will get us part of the way.

But in order to get all of the way, you are going to need to engage the people of America in this effort at the grass roots. Recognize the role of cities. For the first time in human history, we represent more than half of the people who live on this planet and we consume more than 75 percent of the energy that is consumed on this planet. Use us as laboratories. Create, based on the very successful Community Development Block Grant model, an energy and environment block grant, so that we can take these ideas and bring them up to scale, that can make a difference not only for our Nation, but for our globe.

Thank you.

[The prepared statement of Mayor Nickels follows:]

STATEMENT OF GREG NICKELS, MAYOR, SEATTLE, WA

INTRODUCTION

Chairwoman Boxer, Ranking Member Inhofe, members of the committee, thank you very much for the invitation to testify before you today. More importantly, thank you for your leadership on an issue of paramount importance to our nation: global climate disruption.

We are at a historic juncture in this country. The scientific consensus on global warming is increasingly clear and unequivocal—it is happening and human activities are causing it.

My message to you today is twofold:

First, let's act *now*. Let's not wait until the 111th or 112th Congress. Let's seize the moment. Put in place a clear, strong and effective federal policy that is necessary to stabilize the climate: 80 percent reduction of greenhouse gas emissions by 2050, based on 1990 levels.

Second, America's mayors are ready, willing and able to work with you to develop and implement this policy. We are ready to build public support in our communities—including our business communities—to meet this challenge. We are ready to implement local solutions. In fact, many of us are already doing just that.

U.S. Mayors Climate Protection Agreement 409 mayors across the country have signed on to the U.S. Mayors Climate Protection Agreement[1] that I initiated with eight other mayors just over 2 year ago. These mayors represent over 60 million people—nearly a fifth of the U.S. population—in all 50 states, plus the District of

[1] See Attachment A: U.S. Mayors Climate Protection Agreement. The resolution can also be found at: http://www.usmayors.org/uscm/resolutions/73rd—conference/env—04.asp

Columbia. They are Democrats, Republicans, and Independents. They are leaders of some of our biggest cities and smallest towns—from Richmond, Virginia and Bozeman, Montana to Akron, Ohio and Cookeville, Tennessee.

Like most economic and environmental issues, climate disruption does not follow geographic or political boundaries. Its impacts affect us all; however the opportunities that global warming solutions present are open to all. That's why the U.S. Mayors Climate Agreement has resonated across the country, regardless of where cities are on the map, and where mayors sit on the political spectrum. That's why Republican mayors from cities such as New York; San Diego; Bellevue, NE; and Arlington, TX have joined Democratic mayors such as myself.

In signing the Agreement, these 409 mayors[2] are pledging to take local action to significantly reduce greenhouse gas emissions in their own communities. Cities across our nation are pledging support for bipartisan greenhouse gas reduction legislation that includes (1) clear timetables and emissions limits and (2) a flexible, market-based system of tradable allowances among emitting industries.

We are not just signing a piece of paper. We are making tough choices. We are investing our taxpayers' money. We are transforming our cities into laboratories for climate protection. In short, we are making a difference, and laying the groundwork for strong federal policies and programs.

For example, we are making the sometimes difficult but necessary changes to land-use policies and regulations. We are reining in sprawl and increasing density in our urban cities, changes that reduce energy and fuel use by cutting greenhouse gases an average of close to 30 percent.

We are investing heavily in public transit, building more bike paths and making it safer for pedestrians to walk to work, school and parks. By doing this, fewer people will need their cars to get around.

We are walking the talk. City governments are using their purchasing power to buy electric hybrid vehicles and biodiesel for our fleets, energy-efficient computers for our offices, and super-efficient LED (light-emitting diode) bulbs for our traffic signals. We're designing "green," energy-efficient buildings and re-using methane gas at our landfills and wastewater treatment plants.

We are doing many of these things in Seattle. But we are most proud that our publicly-owned utility—Seattle City Light—is the first electric utility in the nation to be greenhouse gas neutral. It has achieved this through conservation, using renewable energy resources and investing in offset projects that lower our city's carbon footprint, encourage new business opportunities and improve local air quality. For example, City Light is working with the cruise ship industry to connect ships to shore power while in port rather than burn diesel. We have launched a biodiesel program that pays for the use of this cleaner fuel in local buses, Washington State ferries and city trucks. These and other programs are economically efficient and will help us lower greenhouse gas emissions.

Seattle is certainly not alone in such pioneering efforts.

The city of Irvine, California, the city is supporting the Zero Emission Vehicle Network Enabled Transport program (ZEV–NET), which makes zero-emission vehicles available to participating employers and their employees.

Burlington, Vermont has a Climate Action Plan and joined the 10 Percent Challenge Campaign. The campaign challenges everyone—individuals, businesses, the city and others—to reduce their emissions by 10 percent or more.

In Dayton, city leaders are switching traffic signals to LED technology at hundreds of intersections, reducing carbon emissions significantly. They have also developed a co-generation facility at their wastewater treatment facility. Its engines use methane gas produced at anaerobic digester plant.

Alexandria, Virginia, the historic city just across the Potomac, is modernizing its buildings to LEED standards. They have funded this project through bond revenues and the annual budget.

In St. Paul, Minnesota, the city initiated the Saint Paul Environmental-Economic Partnership Project in 1993 to implement its Urban CO_2 Reduction Plan. This plan includes diversifying transportation options, reforesting the urban landscape, increasing energy efficiency, promoting alternative energy and increasing recycling and reducing waste.

The list goes on and on. Our nation's commitment to climate protection grows stronger each day.[3]

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[2] See Attachment B: Map of the Participating Cities. The map is updated at: http://www.seattle.gov/mayor/climate/default.htm#who

[3] These examples and others can be found in Energy and Environment: The United States Conference of Mayors Best Practices Guide, January 2007. To learn more about the Burlington,

Continued

Why are a growing number of mayors and communities making global warming a local priority? There are three key reasons.

First, we're increasingly concerned about local impacts, not only on our urban environments, but on our economies and overall quality-of-life. We are the first responders to emergencies and we will feel the most immediate effects of rising seas, more fires, more unpredictable weather patterns. In Washington State we are already beginning to see some of the impacts of global climate disruption in the Cascade Mountains, where changing snow melts and shrinking glaciers threaten our major source of water and electricity.

Second, we're excited about the economic opportunities presented by this challenge to make our cities more climate-friendly—opportunities for our families and businesses to save money through increased efficiencies, and opportunities for our companies to create jobs and revenues by inventing and producing cleaner energy sources and technologies. In the Seattle area, for example, green building and biodiesel production already are emerging as strong and growing sectors of our economy.

Third, we feel a strong sense of responsibility. A large percentage of the world's energy—something on the order of 75 percent—is consumed in or by the world's cities. So we can't solve global warming without making our cities significantly more energy-efficient and less dependent on fossil fuels. Cities are on the critical pathway to a global solution. And American cities, in particular—among the wealthiest on Earth—have a responsibility to lead the way.

SEATTLE'S EXPERIENCE

That's why in February of 2005— a year in which we were nearly "snowless in Seattle"— I challenged my own community to meet or beat the climate pollution-cutting goal of the Kyoto Protocol, and invited my fellow mayors across the country to do the same. In the longer term, I believe much deeper cuts are necessary. But I wanted to challenge the government and the community to make significant cuts in the short-term, on my watch as mayor: 7 percent reductions from 1990 levels by 2012.

By that time, we already had reduced our city government emissions by about 60 percent from 1990 levels, thanks in large part to the efforts of our publicly owned utility—Seattle City Light—to make itself the Nation's first "climate-neutral" utility. We also had aggressive recycling, green building and green fleet management programs underway.

But despite our success as a city government, we saw that community-wide emissions were rising dramatically, driven in large part by motor vehicle emissions. So we turned our attention to shrinking the community's "carbon footprint." We established a Green Ribbon Commission on Climate Protection consisting of about 20 of our community's most-respected leaders and experts. It was co-chaired by Denis Hayes, the president of the Bullitt Foundation and founder of Earth Day, and Orin Smith, the now-retired CEO of the Starbucks Coffee Company. And it includes the president of the board of REI, Inc., Bill Ruckelshaus, the three-time U.S. EPA Administrator, and many other leaders from the business, government, and nonprofit sectors.

The commission spent a year poring over data and reviewing best practices from around the world. Their work culminated in the Seattle Climate Action Plan, which I released in September of 2006.[4] This is a blueprint for significantly reducing greenhouse gas emissions in our community. It features a variety of strategies for reducing car-dependence in Seattle, increasing fuel efficiency and the use of biofuels, and improving energy efficiency and the use of renewable energy sources.

We've created the Seattle Climate Partnership, a voluntary pact among Seattle-area employers to assess and reduce their own carbon footprints, and to come together to help meet our community-wide goals. Thirty employers have joined the Partnership already, including Starbucks, REI, the Port of Seattle, the University of Washington, GroupHealth Cooperative, the Fred Hutchinson Cancer Research Center and the Greater Seattle Chamber of Commerce.

Seattle does all this because our citizens are demanding it. They expect leadership from their elected officials, their business leaders and their public power agencies to step up to this tremendous challenge we all face.

Vermont example, please go to: http://www.burlingtonelectric.com/SpecialTopics/Reportmain.htm .

[4] See Attachment C: Seattle, a Climate of Change: Meeting the Kyoto Challenge-Climate Action Plan Executive Summary, September 2006. The Executive Summary and the full report can also be found at: http://www.seattle.gov/climate/.

In addition to the activities we are undertaking in Seattle, the State of Washington is also moving toward implementing a climate plan. The governor has just issued an Executive Order calling for the state to implement a climate action plan that includes greenhouse gas reduction targets. Likewise, there are over a dozen bills pending before our state legislature calling for actions dealing with climate change. And this past Monday, my governor announced that Washington will join with Oregon, California, Arizona and New Mexico to form the Western Regional Climate Action Initiative, pledging to work together to reduce greenhouse gas emissions.

However, while voluntary actions by cities or state mandates are important what we really need is federal leadership. Not just because it is the most powerful way to confront this problem but also because it will allow us to achieve the most reductions for the least costs to our economy.

We believe this is the year for federal action. Specifically, we believe Congress needs to adopt a greenhouse gas reduction plan that calls for a hard and declining cap on emissions and allows for carbon trading among entities. To achieve the most reductions at the lowest possible cost we believe that this trading program should allocate allowances in ways that encourage hydropower and other renewable resources, rewards past and future conservation and energy efficiency, and recognizes credit for early action.

UNITED STATES CONFERENCE OF MAYORS AND THE 110TH CONGRESS

I am pleased that the U.S. Conference of Mayors has been the leading local government organization on this issue. The U.S. Conference of Mayors led by Mayor Douglas Palmer of Trenton, New Jersey, recently released its 10-Point Plan, for Strong Cities, Strong Families, for a Strong America at our 75th Winter Meeting.[5] The mayors were so pleased, Madame Chair, that you could join them to share your vision on the need for action by Congress to further the nation's progress on climate protection.

In our 10-Point Plan, the nation's mayors have made action on federal climate legislation our lead issue. As I have noted, the mayors want to play a strong role in helping you and members of this committee make the federal policy changes that will further progress in our communities, in our states and the nation.

The mayors are proposing an Energy and Environmental Block Grant initiative, modeled after the very successful Community Development Block Grant program. We believe such an initiative is particularly critical at this juncture as cities strive to expand their climate protection efforts. The nation has a real interest in expanding the many local initiatives that are underway in my city and others all across the country. This block grant would accelerate the many innovations emerging in our cities, which are the laboratories of future solutions to this vast challenge before us.

Our goal with this block grant initiative would be to use federal grants to (1) improve community energy efficiency; (2) develop and implement community strategies to reduce carbon emissions, including but not limited to achieving "carbon free" buildings by 2030; (3) develop and implement community and transportation energy conservation programs; (4) encourage the development of new technologies and systems to decrease our dependence on foreign oil; and (5) promotion and development of alternative/renewable energy sources.

We need the Federal Government to take on a leadership role now so that we move beyond the grassroots innovation that is blossoming in every state in the country. This Congress needs to move quickly to adopt meaningful carbon policies—ideally through a broad-based cap and trading program to reduce this country's greenhouse gas emissions. This will harness market forces and allow the powerful engine of our economy to find the most innovative and cost-effective solutions to this global challenge.

Mayors from across the United States look forward to working with you on this challenge.

[5]A copy of 10-Point Plan, for Strong Cities, Strong Families, for a Strong America can be found at: http://usmayors.org/uscm/news/press—releases/documents/10-PointPlan.pdf

Attachment A

2005 ADOPTED RESOLUTIONS
ENVIRONMENT

ENDORSING THE U.S. MAYORS CLIMATE PROTECTION AGREEMENT

WHEREAS, the U.S. Conference of Mayors has previously adopted strong policy resolutions calling for cities, communities and the federal government to take actions to reduce global warming pollution; and

WHEREAS, the Inter-Governmental Panel on Climate Change (IPCC), the international community's most respected assemblage of scientists, has found that climate disruption is a reality and that human activities are largely responsible for increasing concentrations of global warming pollution; and

WHEREAS, recent, well-documented impacts of climate disruption include average global sea level increases of four to eight inches during the 20th century; a 40 percent decline in Arctic sea-ice thickness; and nine of the ten hottest years on record occurring in the past decade; and

WHEREAS, climate disruption of the magnitude now predicted by the scientific community will cause extremely costly disruption of human and natural systems throughout the world including: increased risk of floods or droughts; sealevel rises that interact with coastal storms to erode beaches, inundate land, and damage structures; more frequent and extreme heat waves; more frequent and greater concentrations of smog; and

WHEREAS, on February 16, 2005, the Kyoto Protocol, an international agreement to address climate disruption, went into effect in the 141 countries that have ratified it to date; 38 of those countries are now legally required to reduce greenhouse gas emissions on average 5.2 percent below 1990 levels by 2012; and

WHEREAS, the United States of America, with less than five percent of the world's population, is responsible for producing approximately 25 percent of the world's global warming pollutants; and

WHEREAS, the Kyoto Protocol emissions reduction target for the U.S. would have been 7 percent below 1990 levels by 2012; and

WHEREAS, many leading US companies that have adopted greenhouse gas reduction programs to demonstrate corporate social responsibility have also publicly expressed preference for the US to adopt precise and mandatory emissions targets and timetables as a means by which to remain competitive in the international marketplace, to mitigate financial risk and to promote sound investment decisions; and

WHEREAS, state and local governments throughout the United States are adopting emission reduction targets and programs and that this leadership is bipartisan, coming from Republican and Democratic governors and mayors alike; and

WHEREAS, many cities throughout the nation, both large and small, are reducing global warming pollutants through programs that provide economic and quality of life benefits such as reduced energy bills, green space preservation, air quality improvements, reduced traffic congestion, improved transportation choices, and economic development and job creation through energy conservation and new energy technologies; and

WHEREAS, mayors from around the nation have signed the U.S. Mayors Climate Protection Agreement which, as amended at the 73rd Annual U.S. Conference of Mayors meeting, reads: The U.S. Mayors Climate Protection Agreement A. We urge the federal government and state governments to enact policies and programs to meet or beat the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012, including efforts to: reduce the United States' dependence on fossil fuels and accelerate the development of clean, economical energy resources and fuel-efficient technologies such as conservation, methane recovery for energy generation, waste to energy, wind and solar energy, fuel cells, efficient motor vehicles, and biofuels; B. We urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that includes 1) clear timetables and emissions limits and 2) a flexible, market-based system of tradable allowances among emitting industries; and C. We will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities such as: 1. Inventory global warming emissions in City operations and in the community, set reduction targets and create an action plan. 2. Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities; 3. Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit; 4. Increase the use of clean, alternative energy by, for example, investing in "green tags", advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology; 5. Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money; 6. Purchase only Energy Star equipment and appliances for City use; 7. Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system; 8. Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel; 9. Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production; 10. Increase recycling rates in City operations and in the community; 11. Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2; and 12. Help educate the public, schools, other

jurisdictions, professional associations, business and industry about reducing global warming pollution.

NOW, THEREFORE, BE IT RESOLVED that The U.S. Conference of Mayors endorses the U.S. Mayors Climate Protection Agreement as amended by the 73rd annual U.S. Conference of Mayors meeting and urges mayors from around the nation to join this effort.

BE IT FURTHER RESOLVED, The U.S. Conference of Mayors will work in conjunction with ICLEI Local Governments for Sustainability and other appropriate organizations to track progress and implementation of the U.S. Mayors Climate Protection Agreement as amended by the 73rd annual U.S. Conference of Mayors meeting.

return to resolution index

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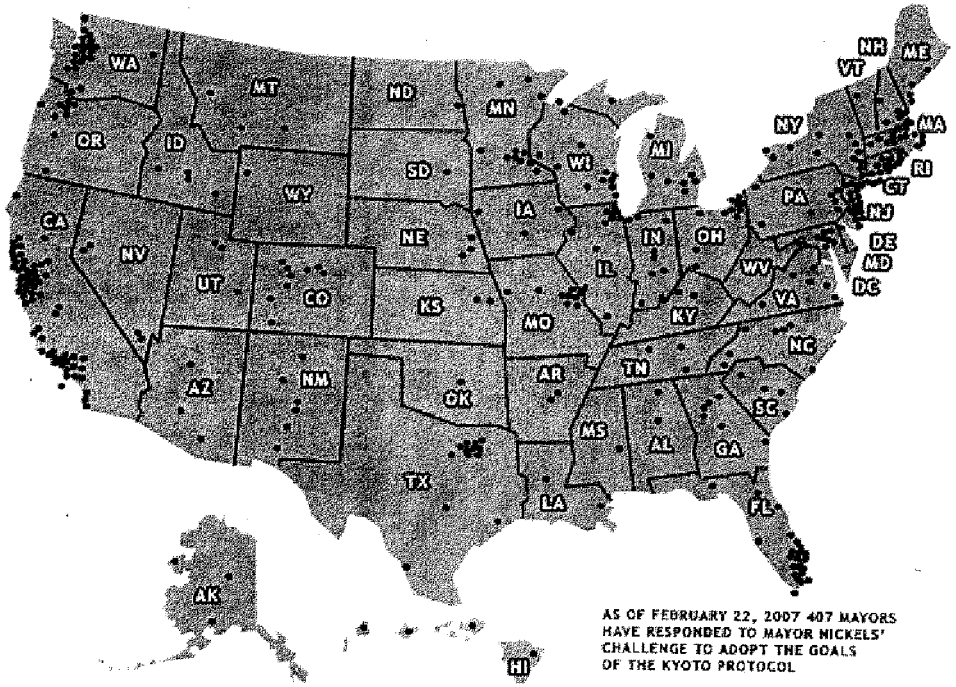
Attachment B



Attachment C

Seattle, a Climate of Change: Meeting the Kyoto Challenge
Climate Action Plan: Highlights
September 2006

Introduction

The climate crisis presents Seattle with an extraordinary challenge. The local impacts—winter flooding, summer drought, rising sea levels, heightened wildfire risk, receding glaciers and declining snow pack—pose serious risks to our economy and our quality of life.

In February of 2005, Mayor Greg Nickels challenged fellow mayors across the country to join with Seattle in pledging to meet or exceed the Kyoto Protocol's emissions-reduction goals. So far, more than 300 mayors, representing 51 million Americans in 46 states have signed the U.S. Mayors Climate Protection Agreement.

The Seattle Climate Action Plan is the way Seattle will meet those goals and reduce greenhouse gas emissions as a city to 7 percent below 1990 levels by 2012. It is guided largely by the March 2006 recommendations of the mayor's Green Ribbon Commission on Climate Protection.

The challenge is great. Success will depend on individuals, businesses and the community working together in ways large and small to reduce greenhouse gas emissions.

The plan will support individuals in reducing emissions at home, at work and on the road through investments in transit, conservation and education. It will help businesses conserve energy and implement climate protection improvements. And it will strengthen and expand the City of Seattle's effort to reduce its emissions as it provides services to people across the city.

Mayor Nickels and the City of Seattle believe strongly that local action is a critical part of the global solution; Seattle's successes will provide a model for policies that must ultimately be developed worldwide to stabilize the climate. Further, the technological innovation that will accompany the necessary shift in our energy consumption will generate significant economic opportunity.

Seattle is more than up to the task of greening our own community and leading others. The government has reduced its own climate pollution by 60 percent since 1990, led by City Light, the only electric utility to achieve net-zero greenhouse gas emissions. Seattle's waste reduction and water and electricity conservation programs are among the nation's best.

The Climate Action Plan

The plan details substantial new investments to encourage businesses and residents to take action and to expand the City's emissions-cutting programs. The mayor has proposed $37 million over the next two years for climate protection actions such as expanded transit service, and improved and new bicycling and pedestrian facilities. It includes money to convert to more climate-friendly vehicles and equipment throughout the City, to start a new business partnership devoted to climate protection, and to launch a broad campaign to educate residents and businesses about the link between climate disruption and fossil fuel consumption.

The funding sources include $34 million from "Bridging the Gap," which voters will consider in November, and $3 million in the mayor's 2007 and 2008 budget proposal.

The plan also extends existing climate-protection initiatives, like Seattle City Light's net-zero emissions efforts, smart growth policies and regulations to promote development in urban centers and the City's green fleet and green building programs.

The City and the community's progress will be measured, and the plan updated, every two years by an interdepartmental Climate Team coordinated by the Office of Sustainability and Environment (OSE). OSE will update the community's and the City's greenhouse gas inventories every three years.

Successful implementation of Seattle Climate Action Plan will move us substantially toward the Kyoto target. But, of course, Kyoto is just a beginning. To stave off the potentially catastrophic impacts of climate disruption will require a sustained effort well beyond 2012 and well beyond Seattle.

The challenge before us is big. No city in America is more capable of exceeding it.

To get to the Kyoto goal, Seattle must cut its emissions by about 680,000 metric tons.

The sources of Seattle's climate pollution are really no different from any other region. Our greenhouse gases come almost entirely from using energy in everyday life. Roughly half the climate pollution in Seattle comes from burning fossil fuels to move ourselves and our goods in cars, trucks, buses, trains and airplanes. Another quarter comes from heating our homes and buildings, primarily with natural gas.

The community will cut greenhouse gas emissions in three major ways: reducing our dependence on cars, increasing fuel efficiency and the use of biofuels, and conserving and using cleaner energy in our homes, businesses and institutions. The City will pursue policies to bolster its leadership in climate protection and to inspire broader action.

Reduce Seattle's Dependence on Cars

- The City will invest $1.5 million to increase transit service in Seattle, which King County's Transit Now ballot measure, if it passes, will match 2 for 1, for an estimated 45,000 additional hours of service citywide.

- The City has committed $3 million for transit corridor and reliability improvements, which Transit Now will match with an additional 5,000 service hours, allowing faster more reliable bus service in the city's most congested routes to Downtown (Ballard, West Seattle, Pine Street, First Hill).

- The City will double the existing 25 miles of marked and striped bicycle lanes.

- The City will make walking more attractive by installing 200 new pedestrian curb ramps and upgrading 50 marked crosswalks to national safety standards by the end of 2008.

- The City will implement a 10 percent commercial parking tax to be phased in over three years, beginning in July 2007.

- Mayor Nickels has allocated $100,000 to work with regional partners to analyze and develop road pricing scenarios and address any legal and implementation issues.

Increase Fuel Efficiency and Use of Biofuels

- The City, partnering with Puget Sound Clean Cities Coalition and the Puget Sound Clean Air Agency, will increase fuel efficiency and the use of biofuels by commercial fleets through a "Smart Fleets" educational outreach program.

- The City will begin increasing its biodiesel blend from 20 percent biodiesel (B20) to as much as 40 percent (B40) in 2007.

- The Seattle Police Department will begin in 2007 to transition all of its non-pursuit vehicles to efficient gas-electric hybrids.

- The City will examine the use of smaller, more fuel-efficient vehicles as taxicabs and offering incentives to taxicab owners to use gas-electric hybrid vehicles, culminating in recommendations to the Mayor by the end of 2007. In addition, the City will continue to work with King County, the Port of
Seattle and taxi companies to explore ways of reducing the amount of taxi "deadheading" in the region.

Achieve More Efficient and Cleaner Energy for Homes and Businesses

- City's Light's mitigation program has already sealed its net-zero emissions status for 2007 by participating in offset programs and has committed to acquire at least 7.5 average megawatts through conservation measures in 2007 and 2008.

- In 2007, Seattle Public Utilities and City Light will implement a comprehensive shower-head and faucet aerator program for all residential customers to conserve hot water heated by gas and electricity. Program materials will feature greenhouse gas reductions as one of many benefits.

- The City will hire a dedicated energy specialist and implement cost-effective conservation and energy efficiency measures in City facilities.

- Seattle Parks and Recreation will install covers on the Helene Madison and Ballard swimming pools, which are heated by natural gas, in 2007. In addition, in partnership with Puget Sound Energy, Parks is establishing a Resource Conservation program to identify and implement cost-effective energy conservation measures.

Extend the City's Leadership

- Seattle Public Utilities, the City's second-largest department, will complete its own greenhouse gas emissions inventory, reduction target and action plan.

- The City will fully mitigate all business-related air travel by City employees beginning in 2007 by purchasing carbon-offset projects annually.

- The City will launch a campaign to encourage all 10,000 City employees to reduce climate pollution on the job and at home.

- A newly-created Department of Executive Administration Green Team will assess and, where appropriate, promote the purchase and use of climate-friendly products, such as super-efficient "80-plus" computers and servers.

- OSE and the Department of Finance will work with the Seattle City Employees Retirement System to explore options for climate-friendly investing that are consistent with State law governing the System's investments. This may include actions such as assessing both the risks to City investments posed by climate disruption and the opportunities to invest in climate solutions; asking companies in the City's existing investment portfolio to disclose climate risk information through reporting mechanisms such as the Carbon Disclosure Project or Global Reporting Initiative; and joining the Investor Network on Climate Risk.

Inspire Action

- The Seattle Climate Partnership, begun with support from OSE, will provide Seattle area employers with resources for assessing their climate impacts and implementing strategies for reducing emissions. The Partnership will also develop strategies for achieving emissions through relationships with employees, customers, suppliers and vendors.

- The Department of Neighborhoods will launch a Neighborhood Climate Protection Matching Fund to promote and help finance neighborhood-based climate protection projects such as local biodiesel cooperatives, tool- and car-sharing programs, anti-idling campaigns and community energy conservation actions.

- The City, in partnership with Puget Sound Clean Air Agency, King County, Climate Solutions, Puget Sound Energy, AAA-Washington and others, will launch in early 2007 a regional campaign, including a "Drive Smart" program, to engage and inspire Puget Sound area residents and businesses to incorporate climate protection action into their daily affairs.

RESPONSES BY GREG NICKELS TO ADDITIONAL QUESTIONS FROM SENATOR CARDIN

Question 1a. I noted with interest your reference to an effort at the Port of Seattle to have ships "plug-in" while at dockside, enabling vessels to turn off their diesel engines and thus reducing air emissions.

Response. Seattle City Light, Seattle's municipal electric utility, worked with the Port of Seattle, Princess and Holland-America cruise lines, and the Puget Sound Clean Air Agency (PSCAA) to provide shore power connections to four ships that visit the Port of Seattle facilities. These ships are in Port on Friday, Saturday and Sunday during the cruise season, May through September. Princess has been using shore power since 2005 and Holland-America since 2006. City Light engineers worked closely with the Port and cruise lines on tight deadlines to make the project a reality. A grant from the EPA West Coast Diesel Collaborative helped defray some of City Light's costs. The cruise lines pay for the electricity they use, and City Light purchases the greenhouse gas reduction rights (offsets) that result from using electricity rather than diesel. In addition to reduced greenhouse gas emissions, the use of shore power also eliminated diesel particulate emissions while the ships are in port, an important health benefit.

Question 1b. Would you please provide additional information to the committee on this innovative approach, including: Who pays for/maintains the electrical hookups at dockside?

Response. The cruise lines pay for and maintain the dockside electrical connections.

Question 1c. Is the program voluntary or mandatory?

Response. The program is voluntary.

Question 1d. Is there an estimate of emissions reductions associated with this initiative?

Response. When electricity is used instead of diesel, there are zero emissions at the dock location, an important health benefit since ports are often near major population centers. Studies by the Port of Seattle indicate that "hoteling" of ocean-going vessels is a source of criteria pollutants such as NOx, SO_2, and particulates and diesel particulate matter. The overall emission reductions will depend on how the electricity is produced, and the emissions of the ship's diesel engines. If the northwest regional electricity market mix is assumed, Seattle City Light has estimated that several thousand metric tons of carbon dioxide are avoided each cruise season through the use of shore power.

Question 1e. Are these air emission reductions part of the Clean Air Act Washington State Implementation Plan?

Response. The cruise ship electrification is not part of the Washington SIP. It was implemented to reduce greenhouse gas emissions, sulfur dioxide and particulate emissions in the vicinity of the cruise ship terminal. Puget Sound Clean Air Agency negotiated it with the port and cruise lines after the cruise lines rejected the use of lower sulfur fuels while at the dock.

RESPONSES BY GREG NICKELS TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. It is estimated that even full implementation of Kyoto would impact global temperature by only 0.07°C. What impact on global temperature will this program have? And at what cost to the 60 million residents of the 409-member cities? (Currently there are 527-member cities.)

Response. The Kyoto targets embedded in the Mayor's Climate Protection Agreement (MCPA) are intended to be a first step to reduce greenhouse gas emissions by local governments and to spur action at the state and Federal Government levels. The Intergovernmental Panel on Climate Change (IPCC) has established the emission reductions necessary to truly normalize climate variability. Seattle endorses a long-term target of 60 percent emission reductions from 1990 levels, while remaining committed to the near-term target in the MCPA of 7 percent below 1990 levels by 2012.

There are significant economic costs associated with inaction which could easily overwhelm costs associated with reducing greenhouse gases. Globally, the most recent report from the IPCC lists many widespread changes that are already being observed; many are considered warning signals of an already changing climate. For example, since the 1970's we have seen harsher and longer droughts in the tropics and subtropics and an increase in intense tropical cyclone activity in the Northern Atlantic. Heavy rain storms have increased over most land areas.

The Pacific Northwest, where we are overwhelmingly reliant on hydropower, is particularly at risk. Seattle City Light, our city's publicly owned electricity provider,

receives 90 percent of its electricity from hydropower, much of it from dams operating in the Northern Cascades. Snow packs have already been reduced in the Cascades since the end of World War II and University of Washington climate scientists expect to see this trend continue and even accelerate in the coming decades. Reductions in snow pack will reduce the viability of hydropower in the Pacific Northwest at great potential expense to area utilities and residents.

Question 2. Were you aware that Claude Allegre—the former Socialist party Leader and geophysicist who is a member of both the French and U.S. academies of science who used to be a leading alarmist about global warming—has now reversed his position? He now thinks it may be due to natural variability and that this is about money. How do you respond to this statement?

Response. The City of Seattle believes that human-related climate change is real; that it poses the single largest environmental threat with consequences for economies and communities throughout the world; that it is underway; and that Congress should act soon to pass legislation calling for greenhouse gas reductions. While continuing to press for national leadership to curb greenhouse gas emissions, the City of Seattle has chosen to take actions now, believing that local governments, citizens and businesses must lead by example.

Senator BOXER. Thank you for that excellent testimony.

Now we are going to hear from the Mayor of Des Moines, Frank Cownie, the Hon. Mayor. Welcome.

STATEMENT OF HON. FRANK COWNIE, MAYOR, CITY OF DES MOINES, IA

Mayor COWNIE. Thank you, Madam Chair. I am Frank Cownie and I am the Mayor of Des Moines, IA, which is the capital of the great State of Iowa.

As I thought about what I was going to testify to when I came here, one of the reasons we are so concerned about global warming and climate protection has to do with quality of life. We think that is our No. 1 asset. We have committed, in the city of Des Moines, to minimize all the costs and the causes that would jeopardize it and try to make strategic investments that we hope will improve that.

It takes guts at every level of government, whether you are sitting in a Federal office or a State office or a local office, because the people are going to see the results of what we do or the consequences of what we don't do, and they are going to be people that we don't even know. They are generations away, mostly, and quite frankly, they will never vote for us. But we have to do it for them, that is part of our future and our calling.

I will cite a few of the things and the initiatives that we have pursued in the city of Des Moines and were provided in my written testimony. We have a Mayor's Task Force that convenes citizens of every walk of life, whether they are low or moderate income, or those more well to do, that are coming together and looking at things that they can do in their homes, in their businesses, in their households. Our task force's written directives to the city council and the city manager, we have written resolutions, we have held town hall meetings with many national level environmental advocates, including Interfaith Power and Light president and founder, Sally Bingham.

We have purchased hybrid vehicles for our police department. We have replaced other vehicles in other departments that operate on biofuels and we are told have a 30 percent increase in fuel efficiency. We are retrofitting municipal buildings to become more energy efficient and improve the lighting and insulation and signifi-

cantly reduce not only greenhouse gas emissions but operating costs.

We have replaced incandescent street lights and stop signals with more efficient LEDs that already have saved us over $120,000 a year. We are encouraging the use and expanding our mass transit system, the Des Moines Area Rapid Transit System. We have recently entered into a contract for the development of a 100 million gallon ethanol production facility at our ag-emergent park which will be lead certified. Our regional solid waste landfill captures enough methane to provide electric power to 10,000 homes.

All of our actions have not only benefited our bottom line, but we feel have improved the environment. Every level of government has its role, and Federal action, we feel, is needed now, because the challenge to protect our quality of life for every citizen is one that every city and every town across this Country faces.

We cannot address this problem alone, quite frankly, we need your help.

If I might take just a moment, a personal comment, we serve at the base level of government. We really are at the pothole level, people are in our faces every day. It seems to me that we cannot really impact climate change without people change. What people do in their everyday lives is the key. I sense a new awareness and a willingness on the part of Des Moines' citizens to seek change for the sake of the environment. If you can empower us at this pothole level of government to work directly with our citizens to develop grassroots solutions, we can achieve real progress.

First, it is important for you to enact legislation to create Federal tax credits or other incentives that will promote energy efficiency. If I——

Senator BOXER. Do you want to summarize the other action items for us?

Mayor COWNIE. Yes. I think we could look at other opportunities, like tax shifts from things that we want to things that we don't want, set standards, CAFE standards, renewable electric standards, packaging standards, recycling standards, water use standards, pedestrian-oriented development standards. Second, it is essential for you to fund research and development, so that we can commercialize some of the things through those programs with demonstration projects in our municipalities across this Country.

[The prepared statement of Mayor Cownie follows:]

STATEMENT OF FRANK COWNIE, MAYOR, CITY OF DES MOINES, IA

Chairman Boxer, distinguished members of the committee, good morning, and thank you for inviting me to testify about the important role of local governments in responding to global warming. My name is Frank Cownie, and I am the Mayor of the City of Des Moines, Iowa. My testimony today will focus on the leadership role that my city has played in practicing and promoting energy conservation.

As both the capital and largest city, Des Moines is the cultural, economic, and geographic center of the State of Iowa. About 200,000 people live in Des Moines, and the City is recognized as a center for government, education, business, culture, and the arts. Des Moines is also quickly becoming a national leader in using energy conservation and environmental protection strategies.

I signed the Mayor's Climate Protection Agreement along with over 400 other Mayors because our residents recognize that there is a finite amount of energy and resources available. Scarcity of resources increases costs. We view this as a crucial issue in protecting our economic vitality and our high quality of life. Our quality

of life is our single greatest asset in Iowa, and we are committed to protecting it and to minimizing costs that would jeopardize it.

That is why we have taken action at the local level. Last year I established the Mayor's Task Force on Energy Conservation and Environmental Enhancement to examine energy usage and environmental protection in Des Moines. We, as the local government, united the broad-based support of residents, businesses, faith-based and non-profit organizations. In addition to the direction set by the Mayor's Task Force, my colleagues and I on the City Council have made sustainability part of our overall goals for the City. Our objective is to become a leader in promoting environmental sustainability and transportation alternatives. To that end, we are pursuing a number of green initiatives.

One of our first major initiatives was introducing hybrid and alternative fuel vehicles into our city fleet. Our Police Department now uses hybrid vehicles for neighborhood patrol and in the detective bureau. As a routine practice, our centralized fleet management staff strives to obtain greater fuel efficiencies every time they purchase replacement vehicles. This is accomplished by writing bid specifications for smaller vehicles or vehicles that utilize alternative fuels, like biodiesel and ethanol.

Another important piece of our goal for sustainability in Des Moines is about providing transportation options to give our residents alternatives to driving their cars. The Greater Des Moines region is building a one-of-a-kind trail system, with over 300 miles of recreational trails to connect Central Iowa. The City of Des Moines alone maintains 29 miles of trails, and we are adding more bike lanes to make it easier for our residents and visitors to bike and walk rather than drive their cars.

The Des Moines Area Regional Transit Authority (DART) was created last year as a regional approach to public transit. DART is planning to expand its routes and hours of operation. This year, for the first time, buses will run on Sundays, which will make it more convenient for our residents to get around without their cars. The City is also leading by partnering with the State and the business community to provide the initial seed money for a downtown shuttle. This service will encourage downtown workers to choose transit, again—instead of their cars, to get around the central city during the day. This will ultimately reduce energy consumption and emissions.

We're also working to improve the energy efficiency of our municipal buildings and infrastructure. We have improved lighting and installed timers in our City parking facilities and in some municipal buildings. We have replaced incandescent traffic signals with more energy-efficient LED bulbs to reduce our electricity consumption. This alone is saving the City $120,000 on energy costs. We have done numerous facility roof insulation upgrades to reduce heating costs and emissions.

We have completed comprehensive upgrades in our fire stations and parks facilities. These include energy efficient windows and improved roof insulation. In one building, the roof insulation alone will reduce energy costs and greenhouse gas emissions by approximately 40 percent. As another unique improvement, we are installing a solar hot water heating system to augment an existing gas-fired water heater. A solar hot water heating system can supply, on average in the Midwest, 65 percent of the demand for hot water. This will result in significant energy savings and reduced carbon dioxide emissions. The City is also working on LEED (Leadership in Energy and Environmental Design) certification for municipal buildings, with one currently under construction. All of these improvements are part of previously planned and budgeted upgrades. In Des Moines, we view routine maintenance as an ongoing opportunity to pursue energy efficiency.

Our Park and Recreation Department staff and volunteers have been strong leaders in the sustainability movement, particularly as it relates to preserving our open land and green spaces. The Park and Recreation Department is pursuing water quality projects, natural management plans for parks, natural forest regeneration, and planting native species. By planting more trees and native prairie grasses, we reduce the need for irrigation, conserve water, and use less chemical fertilizers. In short, conservation has become our way of doing business in Des Moines parks. A "Green Design Checklist" helps to ensure conservation efforts are infused into the design of all parks projects.

For its efforts, the City of Des Moines Park and Recreation Department won a 2006 Urban Steward Award from the Polk County Soil and Water Conservation District. The City of Des Moines was recognized for its recycling program as well. MidAmerica Recycling awarded Des Moines with a Certificate of Recognition for Recycling Excellence for recycling nearly 6,800 tons in 2006.

The City of Des Moines is also engaged in promoting the research and development of alternative fuel sources. We are in the process of selling land in our Agrimergent Technology Park to a company for a 100 million gallon ethanol production facility. As part of the contract, the business is required to produce a LEED-

certified project and to pursue innovative technologies to reduce its natural gas consumption through alternative fuels that will be more environmentally beneficial and more cost-effective, such as biogas.

Finally, the Metro Waste Authority in Des Moines is recovering enough methane at our solid waste landfill to provide electricity for 10,000 homes. This electricity is sold and provides a revenue stream for the Authority. Like our other initiatives, this action not only benefits the environment, but it helps our economic bottom line.

In closing, I want to encourage the committee that federal action on this issue is needed now, because the challenge to protect our quality of life is one that every city and town in the country faces. We cannot address the issue on our own. We need your help.

First, it is important for you to enact legislation to create incentives to promote energy efficiency and reduce resource consumption. These incentives might include federal tax credits, CAFE standards, recycling standards, water use standards or packaging standards that take into account the life cycle costs of product manufacturing, use and disposal.

Second, it is essential for you to fund (a) research and development activities that can be commercialized, (b) greenhouse gas emissions inventories, and (c) demonstration projects in which municipalities like Des Moines can participate to engage our residents to DO JUST ONE THING.

Many of our local initiatives have been aimed internally at improving energy efficiency in our municipal buildings and fleet. The next step is to help our residents to recognize the environmental and economic benefits of practicing energy conservation. It can be as simple as using compact fluorescent light bulbs, dialing the thermostat down in winter and up summer, buying vehicles that use bio-fuels or hybrid technology, taking the bus to work, planning trips for efficiency, carpooling, walking, biking, and planting trees—all that result in saving money and in protecting resources for future generations. These are steps that every citizen can take.

Similarly, we need to convene our business partners and key greenhouse gas emitters and begin to empower them to take actions that will make a difference. Imagine all of the resources that could be conserved and costs averted. Imagine all of the new business opportunities that could result from increased market demand.

We have a choice. Either we can stay the course, working on our own with marginal success, or we can move forward in partnership with the Federal Government to create a significant, positive impact upon on our environment and economy. We choose to go forward. It is now time for federal action to invest in our future, our children's future, our grandchildren's future and with a vision for the next seven generations. We are committed to improving the quality of life in our communities and appreciate your leadership to assist us in accomplishing this far-reaching goal. Thank you.

Senator BOXER. Thank you, sir.

And last but not least, we welcome the Mayor of the city of Dover, Ohio, the Hon. Richard Homrighausen. Welcome.

STATEMENT OF HON. RICHARD P. HOMRIGHAUSEN, MAYOR, CITY OF DOVER, OH

Mayor HOMRIGHAUSEN. Good afternoon, Chairman Boxer, Senator Voinovich and committee members. My name is Richard Homrighausen and I am the Mayor of Dover, OH.

Dover is a small community in southeastern Ohio with a population of approximately 13,000 members in the heart of the industrial midwest. There are more than 900 commercial and industrial business interests located in the city. As you would expect, our goal is to provide reliable, affordable services to these businesses and residents, including electric power. Our 97- year history as a municipal electric community certainly supports these efforts.

Dover's effort toward achieving our goal of affordable, reliable energy is accomplished by a diversified resource portfolio. With our onsite capacity, the city is able to generate 30 percent of its electric needs through a mix of coal-fired, coal with natural gas and diesel generation. In addition, the city owns 9 megawatts of capacity from AMP-Ohio's coal-fired Richard Gorsick station in Marietta, 1 mega-

watt of hydropower generated by New York Power Authority, 3 megawatts from a landfill gas joint venture and 3 megawatts generated by AEP. Any additional generation is purchased through our wholesale supplier, AMP-Ohio, a joint action organization with 119 municipal member communities in five States on an as-needed basis.

The reliability and security value of our onsite capacity was punctuated by the events of the August 2003 blackout in our part of the Country. While surrounding communities were without power for hours and in some instances days, the city of Dover never lost power. I am proud to say that Ohio is working to leave behind its outdated image as being the heart of the rust belt. Ohio's public power communities are leading the way in terms of environmentally responsible electric generation in our region, collectively, wind, run-of-the-river hydropower, and landfill gas are all part of the generation portfolio to available to AMP-Ohio member cities.

Energy conservation is also a priority and something we have been working to implement and raise awareness of in the city of Dover. All of us share a concern about the environment and the recent attention being given to climate change, and the impact of greenhouse gas emissions is an important discussion. But as is usually the case, how best to address these issues is at the heart of the debate.

My main concern is that the cost will fall disproportionately on the poor and the elderly, those least able to afford such measure, and that impact will hit especially close to home. Following the death of my wife Linda's father at age 45, my mother-in-law was able to raise her other two sisters and send them to school on her social security income alone. Today, her only source of income is her $720 social security check. She lives in a 928 square foot apartment that we were fortunate enough to be able to build for her next to our house. Twenty-four percent of her social security goes toward her utilities, $92 in gas and $80 for electric, water and sewer. Thankfully, she lives in a public power community that provides affordable and reliable electric generation by coal, or she would not be able to live alone. Granted, it is also a big help that we don't charge her any rent.

[Laughter.]

Mayor HOMRIGHAUSEN. My point is that it only leaves her $548 for food, medicine, insurance, gasoline and automobile expenses, cable and phone. Any increase beyond what she has to pay now would be devastating. Fortunately, she is not alone, but others are not as lucky.

My point is to stress the importance of a message that there is no one-size-fits-all approach to addressing these issues. States are unique and have engaged on this issue in ways that make sense and work for them. A Federal program that sets limits on carbon dioxide and other greenhouse gases would disproportionately penalize some regions, including my own.

Nationally, coal represents roughly one half of our available power supply, and that figure is higher in my region, with utilities emitting approximately 40 percent of all greenhouse gas emissions. Compare this to California, where coal has limited use in the gen-

eration of resource mix, and utilities are responsible for about 20 percent of the greenhouse gas emissions. In addition, California's economy does not reflect the same industrial base that exists in our region of the Country, an industrial base that supplies products throughout the Nation and is highly sensitive to electric prices in a global market. In-State generation of coal has not been an option for California utilities for decades, while the midwest region is highly dependent on coal-fired generation.

Looking specifically——

Senator BOXER. If you would like to wrap up, you have gone over time. If you want to leave us with one final fabulous idea.

Mayor HOMRIGHAUSEN. As the committee continues to investigate climate change and consider possible new regulatory regimes, I urge you to remember cities like Dover, OH. Please recognize that we have an industrial base that helps supply the Nation, that we are located in a region with a still-struggling economy and that our part of the Country is historically dependent on coal-fired generation and doesn't have the ability to rely on renewable resources to the same extent as other regions.

[The prepared statement of Mayor Homrighausen follows:]

STATEMENT OF RICHARD P. HOMRIGHAUSEN, MAYOR, CITY OF DOVER, OH

Good morning Chairman Boxer, and members of the Committee on Environment and Public Works, my name is Richard P. Homrighausen, and I am the Mayor of the City of Dover, Ohio. As a Mayor from a small Southeastern Ohio town, I am honored to be invited for the third time, to testify before this committee and offer a state and local government perspective on climate change. I will focus my remarks on my concerns about how the regulations being discussed would impact local governments—especially those like my community, which owns and operates a small coal-fired generation facility.

Dover, Ohio, with a population of approximately 13,000, is in the heart of the industrial Midwest, and I believe our experiences are shared by a great number of small to mid-sized municipalities across the region. There are more than 900 commercial and industrial business interests located in the City of Dover. As you would expect, our goal is to provide reliable, affordable services to these businesses and residents—including electric power. Our 97-year history as a municipal electric community certainly supports these efforts.

Dover's effort toward achieving our goal of affordable, reliable energy is accomplished by incorporating a variety of different processes. The city-owned, 14-megawatt coal-fired powerplant (which is also co-fired with natural gas) is our main source of generation. An additional 18-megawatts of "stand-by" electricity can be generated by our natural gas turbine. We have seven diesel generators with a total capacity of 13.4 megawatts. Four of these diesel units are solely owned by the city and three are jointly owned by the city and AMP-Ohio. In addition to our on-site generation capacity, the city owns nine megawatts of capacity from AMP-Ohio's coal-fired Richard H. Gorsuch Generating Plant in Marietta, Ohio, one megawatt of hydro power generated by the New York Power Authority, three megawatts from a landfill gas joint venture, and three megawatts generated by AEP. Finally, any additional needs we have are purchased through our wholesale supplier, AMP-Ohio, on an as-needed basis.

With our on-site capacity we are able to generate approximately 30 percent of our energy demand locally. The reliability and security value of this local resource was punctuated by the events of the August 2003 blackout in our part of the country. While surrounding communities were without power for hours, and in some instances days, the city of Dover never lost power. As noted, our partner in our effort to supply affordable reliable power to our community is American Municipal Power-Ohio, a joint action organization with 119 member-municipal electric systems in five states.

I'm proud to say that Ohio is working to leave behind its outdated image as being the heart of the "rust belt". Ohio's public power communities are leading the way in terms of environmentally responsible electric generation in our region. Collectively, wind, run-of-the-river hydropower and landfill gas are all part of the genera-

tion portfolio available to AMP-Ohio member utilities. Energy conservation is also a priority—and something we've been working to raise awareness of in the City of Dover.

All of us share a concern about the environment, and the recent attention being given to climate change and the impact of greenhouse gas emissions is an important discussion. But, as is usually the case, how best to address these issues is the heart of the debate. I've read about various statistics relating to the impact of the different climate change proposals on the economy, on energy production and on energy prices. Since I am not a scientist or economist, I cannot debate the validity of such studies and whether their results are high, low or right on. However, I am concerned that the cost impact will fall disproportionately on the poor and elderly—those least able to afford such measures. And, that the impacts will hit especially close to home.

Following the death of my wife Linda's father, at age 45, my mother-in-law raised Linda's two sisters on social security alone, and she was able to put them through college. Today, her only source of income is her $720 Social Security check. She lives in a 928-square-foot apartment we were able to build for her next to our house. Twenty four percent of her Social Security goes for her utilities—$92 in gas and $80 for electric, water and sewer. Thankfully, she lives in a public power community that provides affordable and reliable electricity generated by coal or she would not be able to live alone. Granted, it is also a big help that we don't charge her rent, but my point is that almost a fourth of her income goes for utilities, which only leaves her $548 for food, medicine, insurance, gasoline and automobile expenses, cable and phone. Any increase beyond what she has to pay now would be devastating. Fortunately, she is not alone—others are not as lucky.

My point is to stress the importance of the message that there is no "one size fits all" approach to addressing these issues. States are unique and have engaged on this issue in ways that makes sense and works for them. Some states have clean coal research and development programs, others have tax credits for renewable energy, and still others have renewable portfolio standards. A federal program that sets limits on carbon dioxide and other greenhouse gases could disproportionately penalize some regions. For example, for regions that are highly reliant on coal for delivery of electricity, or on natural gas for manufacturing, a federal mandatory program could be economically devastating—natural gas used for manufacturing would be diverted to electricity production and prices would become higher and much more volatile. This is something we have already experienced in recent years, although to a much smaller degree.

One of the issues I was asked to consider in my testimony today was the California plan. There are obvious and important differences between California and other regions of the country. I believe that we need to strive to find answers that work to achieve desired goals—yet balance the needs of the entire nation, and in my case, Ohio in particular.

Nationally, coal represents roughly one-half of our available power supply, and that figure is higher in my region with utilities emitting approximately 40 percent of all greenhouse gas emissions. Compare this to California where coal has limited use in the generation resource mix, and utilities are responsible for about 20 percent of the greenhouse gas emissions. In addition, California's economy does not reflect the same industrial base that exists in our region of the country—an industrial base that supplies products throughout the nation and is highly sensitive to electricity prices in a global market. In-state generation of coal has not been an option for California utilities for decades, but the Midwest region, and indeed the nation as a whole cannot shut coal out as a resource option—not if we also want to maintain our national goals of energy independence, reliability and affordability.

One component, as I understand, of the California Plan is a utility-specific ban on long-term power supply agreements with coal-fired plants that emit more carbon than a combined cycle natural gas plant. Presumably, this is a stocking horse for integrated gasification combined cycle technology, which has become the belle of the ball in terms of coal generation in recent years, and many people feel represents the future of coal generation. They may be right, and I certainly support advancements that allow us to burn coal more cleanly. But, with respect to IGCC, the reality is that there is not enough operational data on the performance of IGCC in real world applications to crown it the only option.

There are, however, promising back-end control technologies for traditional coal facilities, such as ammonia and amine scrubbing, with the potential to capture carbon as well. As the debate moves forward in Congress, I believe it is important to focus on the desired end result and take a technology-agnostic approach to allow for the development and deployment of as many innovative options as possible. We need to ensure that workable options to reduce carbon emissions from coal plants

are both viable and credible and take into account not only costs, but also operational considerations.

Looking specifically at my community of Dover, Ohio, we are highly dependent on coal-fired generation, both through our local facility and our purchases from the wholesale market. However, unlike larger private utility companies, we do not own or have access to a fleet of powerplants that we can selectively control or shut down. Any new climate program must recognize these differences and provide meaningful options for cities like Dover.

Of course, the logical question is "What is Dover doing?" As I mentioned, Dover generates a portion of our electric needs by operating a 14-megawatt coal-fired boiler, co-fired with natural gas burners. Dover was the first municipal electric utility to install co-firing in a commitment to reducing emissions at start-up. Dover is also investigating wind generation by planning to install wind monitors at three of our water towers and at a fourth site the city owns. Although Dover is located in the Tuscarawas Valley, which experiences intermittent wind flow, we won't know if wind generation is feasible until all pertinent data is collected. By late August of this year, Dover's new bag house will be in operation, which will further reduce the emissions from our coal-fired unit. As we speak, our antiquated Boilers #1, #2 and #3 are in the process of being demolished to provide the needed space in our generating facility to install new, state-of-the-art clean coal generation should it become affordable. In the mean time, through our wholesale power supplier, Dover is a participant in the development of new coal-fired generation utilizing proven generation technology with innovative back end control technology, and we are participating in a pilot studying potential carbon capture methods. Through our wholesale supplier, we are also part of the Midwest Regional Carbon Sequestration Partnership.

Public power communities in my region have taken important steps to diversify our existing generation supply and utilize "clean" resources, including wind, landfill gas and run-of-the-river hydro power—and have been recognized statewide and nationally for those efforts. These investments have been at a scale and scope that work for our region—and we are looking at additional generation investments that are carbon free.

The City of Dover has been designated a "Tree City USA" for 26 consecutive years. During that time we have planted 3,540 curb strip trees. Additionally, for the past 23 years the city has distributed an average of 235 Dogwood trees to all first-grade students in the Dover grade schools, for a total of 5,405 additional trees. The city has three parks with several thousand trees, or an additional +/- 6,000 trees. Since the mid 1980's the city has developed 13 residential allotments ranging in size from 12 lots to 150 lots, with each lot required to have a least one tree planted. (The majority of these trees are included in the curb strip tree numbers). This does not take into account all of the other trees in the city that are on private property and in addition to our curb strip trees. All combined, a minimum of 15,000 trees have been planted within the city over the last 26 years.

Energy efficiency is clearly a critical component in the climate change equation, since reduced consumption of electricity in most cases reduces emissions and in all cases postpones the need for new generation. We are utilizing tools that provide practical advice in energy conservation available from our national association, the American Public Power Association, for use with our consumers. The city has an energy audit program, working with our largest customers to help them identify the benefits of increased use of energy efficient lighting and other measures to reduce energy demand. We have made conservation a theme in communications with our residential customers through festivals and other events, emphasizing the critical importance of reducing demand. We routinely distribute energy information and energy conservation tips in our monthly utility bills. The city has also accomplished system upgrades, improving voltages and increasing overall efficiency of our electric system. The city has changed our street lighting program by replacing high voltage, high energy street lights with energy efficient street lights. Dover has 2892 total street lights. To date we have replaced 2250 or 78 percent of our street lights. The monthly savings in kWhrs realized is 18,667. It takes 1.35 pounds of coal to generate 1 kWhr of electricity. Multiplying 18,667 kWhrs by 1.35 equals 25,200.45 pounds of coal or 12.6 tons of coal per month which equals 151.2 tons of coal the City of Dover does not have to burn just by changing our street lights. Once we complete our change-out program this year, the City of Dover will save an additional 43 tons of coal on an annual basis. In addition, we have held mercury thermometer recycling events, which not only keep these devices containing mercury out of our solid waste streams, but also serve to remind residents to "think globally and act locally." These are outward and visible examples of a commitment to a clean environment and to future generations.

As the committee continues to investigate climate change and consider possible new regulatory regimes, I urge you to remember cities like Dover, Ohio. Please recognize that we have an industrial base that helps supply the nation, that we are located in a region with a still-struggling economy, and that our part of the country is historically dependent on coal-fired generation and doesn't have the ability to rely on renewable resources to the same extent as some other regions.

Please also recognize that we understand the need to be responsible environmental stewards and are looking for ways to balance the desire to do so with our need to maintain a viable economy. A plan that starts everyone at "square one" and doesn't recognize the investments already made is neither viable nor credible. In short, don't penalize us for our past good behavior, nor unreasonably restrict our ability to meet the needs of our community. We also encourage you not to pre-empt state efforts to tailor programs that work to balance the unique needs of the varying regions of our great country.

I would hope that any regulatory structure enacted would be economy-wide and apply to all industry sectors, would take into account the financial impacts on consumers and protect the ability of the United States to compete in a global marketplace, and would recognize the need to maintain reliability and protect national security. I also whole-heartedly welcome investments the Federal Government can make in advancing a range of clean-coal technologies, renewable energy generation and energy efficiency programs that benefit all utility sectors and consumers.

This committee, and Congress, has an enormous task at hand. I would ask you to consider the information I have presented, the information presented by my fellow panelists and all other pertinent information available, prior to finalizing any legislation. Please keep in mind that passing legislation too quickly increases the risk of passing the wrong legislation.

Again, I want to thank you for this opportunity and your work on this issue, and I look forward to responding to any questions you might have.

RESPONSES BY MAYOR RICHARD HOMRIGHAUSEN TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. Mayor Homrighausen, if a federal law were enacted similar to California's and the Executive Order signed by Governor Corzine, what impact would that have on people like your mother-in-law?

Response. The impact these measures will have on people like my mother-in-law will be devastating. While the intent of these measures is noble the reality is that the average American cannot afford the costs associated with compliance. As I see it, these measures are a back door attempt to achieve the Kyoto Protocol, which the majority of the American people and Congress do not agree with.

It would be a different story if the 2 largest contributors to global warming, China and India, were made to comply, but they don't so the majority of the burden will lie on the backs of the American people. Additionally, Mexico, where a great deal of America's jobs have been outsourced to, does not have to comply, which only makes this burden the more unbearable.

If we are to be serious in our attempt to curb global warming Congress must take measures to invoke serious economic sanctions on all countries, whether they be developing countries or not, who are not being good stewards of our environment by emitting vast quantities of pollutants into our atmosphere. If these measures are not taken then enacting these measures on our own people will be a hollow attempt, and fall far short in curbing a worldwide problem.

As I have pointed out in my testimony, my mother-in-law cannot afford any additional cost beyond those she already has. Any increase in compliance costs will directly impact, not only my mother-in-law, but all people in our country.

Question 2. Mayor, you testified about the industrial base in your region which supplies the nation. If draconian policies are put in place which dramatically increase natural gas price volatility, what will that do to your local economy and those of neighboring Ohio towns and cities?

Response. Dover is already experiencing the effects of high natural gas prices. Dover was the first Municipal Electric Utility in the country to install natural gas burners to co-fire our start-up process in an attempt to reduce our emissions. The high cost of natural gas has caused the city to limit the use of these burners because the cost far exceeds the benefit gained by burning natural gas.

As natural gas prices increase the cost of doing business increases. As the cost of doing business increases the cost of goods produced increases. As the cost of goods produced increases profit margins decrease so does the competitive edge of any given company. As the ability to compete is reduced the desire to outsource these

goods is increased. Once goods are outsourced these jobs are gone. The City of Dover, and/or any city in the country, need only look at the number of manufacturing jobs that have been lost over the past several years to determine what any major spike in natural gas prices will do to our economy.

If you have an entire country dependant upon the majority of its electricity being supplied by natural gas generation then you have a recipe for disaster. The United States cannot afford to continue to put us at a disadvantage by placing more and more stringent requirements on our industry. Congress has to be serious about its desire and commitment to developing clean coal technology in order for us to continue to be the leader of the free world.

During the hearing I was appalled when Senator Sanders made the following statement (on page 79 of the transcript) " . . . I am wondering what we could do at the Federal level. There have been some indications that if we literally gave away, gave away compact fluorescent light bulbs, we end up saving money." Now I totally understand the intent is to lower our energy usage which in turn reduces the amount of electricity needed, which reduces our demand for energy and the emissions from generation, which saves money everyone money. However, what I don't understand is why anyone in the Federal Government would even consider giving billions and billions of dollars to one of the worst polluters in the world—China—where these bulbs are made?

Dover is home to one of the last incandescent light bulb manufacturing facilities in the country, General Electric, where they manufacture the filament used in incandescent bulbs. If the Federal Government were to supply billions of CFB's to our citizenry then GE in Dover will close. Why not expend these monies on producing affordable CFB's "MADE IN AMERICA" instead of funding our major competitor?

Senator BOXER. I think that is a very important point, Mayor.

So we have heard from everybody, it has been a terrific panel. I am going to use my 4 minutes to make a couple of comments, ask a question of my Californians. But I just wanted to point out, Mr. Harvey, before you leave, I want to give you this interesting article. It is so amazing that today this article would run. In the Washington Post, rapid warming spreads havoc in Canada's forests, tiny beetles destroy pines. Millions of acres of Canada's lush green forests are turning red in spasms of death. A voracious beetle whose population exploded with the warming climate is killing more trees than wildfires or logging. "It's pretty gut-wrenching," said Allen Carroll, a research scientist at the Pacific Forestay Center in Victoria, whose scientific studies tracked a lockstep between warmer winters and the spread of the beetle. "People say climate change is something for our kids to worry about. No, it's now."

Then, this is what really caught my attention in the article. Ironically, the town is booming. The beetle has killed so many trees, the officials have more than doubled the allowable timber harvest, just taking a lead from you, so loggers can cut and haul away as many dead trees as possible before they rot. The icy roads are choked with giant trucks growling toward the mills loaded with logs, marked with the telltale blue stain fungus. But the boom will end when what people hear called beetle wood is removed or rots out, and no one is sure how long it will take. The forest industry will be running at about half speed.

So the point of this is, it is ironic that you mentioned the great opportunity you had. But this is a tragedy in the long run. We need to avoid the tragedy. I don't think it is a great thing to sit here and say, well, we will preside over the end of the forests. It is not right. We did inherit God's green earth and we do have an obligation. By the way, I agree with those of you from the coal States who are throwing up a red flag. We have to work together to make this work.

So here is my question for my Californians, my heroes of the day here, along with Mayor Nickels and Mayor Cownie. But they are my home-grown heroes. Here is the thing. The others are making it sound like, some of the others who oppose what you are doing, in essence, or don't seem to understand it or don't get it, they are saying it was a piece of cake. Now, I don't understand how it could be so easy. It wasn't easy. The fact is, we drive more cars than anyone. Cars are responsible, mobile sources, for about at least a third of the problem.

So I just want to ask you politically, it makes it look like this was the easiest thing in the world. If you could give us a sense of how it was. I don't think it was that easy.

Mr. NUÑEZ. Well, it certainly was a big challenge to pass Assembly Bill 32 in California last year. Just ask the oil refinery industry, for example, or the cement industry, for that matter, or heavy manufacturing in California, the utility industry. But I think in essence people realize that we are seeing the effects of global warming, as others are, at the local level.

Just a quick example, the Sierra snow pack started melting in 2004 in mid-March, which was the earliest in 90 years. In essence, we rely on that snow pack to eventually get us water to southern California and to sustain the agricultural industry in the Central Valley. So I think in essence what happened is people were thinking that perhaps this was not a good idea, this was a tough thing to do, these standards were tough standards, albeit California has already played a major role in conserving electricity and gas and energy. Conservation has always been a big part of our home stay in California, as you know, Senator. We have always been very conscientious about water quality and air quality.

But we felt that we needed to go further. Here is the reason why. I listened very carefully to what some of the Senators said earlier, who perhaps feel that we need to wait until countries like India or China act. Here is the problem. We represent, at the global level, as a Country, less than 5 percent of the population of the world, yet we are responsible for over 30 percent of the world's emissions. In China, they are building a coal plant a week. India is going through the same type of industrial revolution that we went through over 150 years ago. Yes, they are big polluters. But if we wait for them to act and don't play a central role at the global level as a Nation, there is a lot to lose. I believe that we owe it to our children and our children's children to act now.

This wasn't easy to do in California. It was tough. It was a tough choice to make, not just for us as legislators, certainly for the Republican Governor in our State, Governor Schwarzenegger. It was a tough decision for him to make. But we did it because we believed that it was not only our responsibility, Senator, but our obligation to act.

Senator BOXER. Thanks. Don, do you have anything quickly to add?

Mr. PERATA. California is really a self-contained laboratory. What we have found, the Speaker mentioned cement. We found that once we started talking about putting caps on it, they started talking about, can we add more limestone, which would cost less

to produce, less energy and would have the same strength. In an earthquake State, that is important.

Again, there is money to be made, there are jobs to be created. I think why most Californians understand that this is a valuable exercise, and beyond the environment, is that we have lost our defense base, we have lost our manufacturing base. These are the technologies that are going to create the new wave of jobs. We will develop something in California that at the time India and China decide that they are no longer going to choke on their air, we will be able to clean it for them.

Senator BOXER. I think that is such an important point. This is such a plus. It is not gloom and doom and beetles and cutting down trees. It is avoidance of those things.

Senator Voinovich.

Senator VOINOVICH. Thank you. I just couldn't help but think, looking at all of you here, that I was before this committee as a member of the State legislature in Ohio, was the father of the Environmental Protection Agency and came down here and testified. As Mayor of the city of Cleveland, I was here testifying before this committee. I was here before this committee as Governor of Ohio. This is my 40th year in this business.

I would like you to know that for the last 8 years, we have been trying to come up with some kind of compromise to deal with NOx, SOx, mercury and greenhouse gases. The problem has been, we have never been able to get any agreement on the greenhouse gases, because there is such a difference of opinion in terms of the science and so on. As a result of that, we really have not done a good enough job on NOx, SOx and mercury. So we are at the stage where we are probably going to continue to do nothing for the next couple of years, because of a lot of a difference of opinion.

But one of the things that has come out here today, and Mayor Homrighausen, thank you for being here. I know you had a real health problem, thank you for being here. He has been here two or three times to testify. What I would like to do is to challenge each of you, I was very active in an NGA, and we had the Big Seven. We had the National Council of State Legislators. They have committees that deal with the environment. You are in charge at the U.S. Conference of Mayors in terms of their committee. In fact, when I thought of you, I thought of Charlie Royer, I don't know if you know Charlie or not.

Mayor NICKELS. Saw him night before last.

Senator VOINOVICH. Really? If you see him again, say hello to him for me. Great, great guy.

And then we have the National Governors. Madam Chairman, I think it would be really good if we would convene, we call it the Big Seven, to come together to talk about this issue, to see if we can get some consensus out there among State and local government organizations and come here to Congress with some reasonable proposal. Cap and trade has always been kind of a no, no, no. But I think that if done properly and with the right timing, it might be something that we could get done.

But if you could get together and agree to something, representing, I gave you the statistics, I mean, it is different. Cali-

fornia has hardly any coal, and Mayor, we have about 90 percent coal. It falls all over the Country differently.

But the point that Mr. Nuñez made, we are not looking to delay anything. I believe that we need to get going full blast to deal with this. But the real issue here is this whole issue of technology. It is the thing that is holding us back. What we need to do is get that technology, make it work here in the United States and then deal with what is going on around the world. Because a lot of those plants are going to be built without dealing with greenhouse gases. How do you put something on them that does deal with the greenhouse gases?

So the only question I have is that, what do you think about the idea of all of you getting together and trying to come up with some policy that you can come up here and lobby us in terms of, this is what we want to do? You have taken the leadership, the States have, the cities have. You have done a great job. You have actually done more than we have done, a lot more. What do you think of that?

Mr. PERATA. I am up for it.

Mr. NUÑEZ. I certainly think that you have some great minds here in the Congress as well. I do believe that ultimately, there is a saying that says something like necessity is the mother of invention. I believe that until and unless you create a market through real specified mechanisms that require a reduction in our carbon footprint that the time with which the new technologies, for example, coal, I hear a lot of discussion about coal, coal gasification and other alternative ways to make our air cleaner and not depend upon the antiquated forms of energy that we continue to use. Until and unless we have a real necessity and an urgency to produce them, then those technologies will not come. I think we have to create them.

Senator VOINOVICH. Let me say this. Senator Clinton talked about a Manhattan project. In other words, I think we are at that stage right now. If we are going to get a cap, reasonable cap and trade program, you have to have the prospect that we have the technology out there to really do a job with greenhouse gases. I think we have a role to play. I think if we wait for the market to do this, it is not going to happen. By the way, we don't have time to wait. There are people saying, well, put the caps on, and then all of a sudden, this is going to sprout. I think that it hasn't. I think we need to, we have a role in the Federal Government to get on this thing now.

Mr. PERATA. Senator, if I might, there are some great things going on in our State. We would love to have you come. We just got a $500 million grant from British Petroleum for the UC Campus at Berkeley to do renewable energy research. There are many things going on. It might be just the thing you need is a little time in California and we will show you some of the things that are happening. It is very stimulating. It really is.

Mayor COWNIE. Senator, I think that one thing you might do immediately that the Conference of Mayors has worked on is that energy and environmental block grant that is kind of patterned after the CDBG. My problems in Des Moines are different than they are in Seattle.

Senator VOINOVICH. By the way, you had better lobby for CDBG, because they are going to try and knock it out again.

[Laughter.]

Mayor COWNIE. As soon as we leave this meeting, we will head right over——

[Laughter.]

Mayor COWNIE. But I think that whether it is Honolulu or it is New Orleans or Seattle or Des Moines, or any place across this Country, we all have different needs. Certainly we need to do baseline studies, we need to know what our emissions are, where they came from. Then we can put a plan together to try to reduce them.

But there are things people can do every single day in their lives, and I think we need to empower them to do that and educate them. That is something else that we can do also with these dollars. Let local governments decide and State governments how they are going to use it and where it is needed in their particular localities.

Senator BOXER. Mayor Nickels, you have the last word, and then we are going to go to Senator Cardin, who has been so patient. He hasn't even had round one yet.

Mayor NICKELS. And Senator Mayor, I think the U.S. Conference of Mayors would be very excited to engage in that kind of a process. We have sensed this year a real climate of change here on this issue, both here in the Senate and on the House side. We think that is very encouraging and we would like to participate in moving this issue forward, not next Congress or the Congress after, but this Congress.

Senator BOXER. Thank you. Senator Cardin, you have been so patient. Please go ahead.

Senator CARDIN. Thank you, Madam Chair. I wanted to listen to our colleagues from State and local government, because I think we can learn a lot from the initiatives that have taken place. I believe in federalism, and I think it is very important.

In order to get in two rounds, I am going to ask that my opening statement be included in the record.

Senator BOXER. Absolutely, yes.

[The prepared statement of Senator Cardin follows:]

STATEMENT OF HON. BENJAMIN L. CARDIN, U.S. SENATOR FROM THE STATE OF MARYLAND

Madam Chair, thank you for holding this hearing today. Justice Louis Brandeis famously said that "States are the laboratories of democracy." This hearing certainly attests to the truth of that dictum. The regional, state, and local initiatives to slow, stop, and ultimately reverse the growth of greenhouse gas (GHG) emissions that we will hear about today are truly significant.

Consider California: if it were its own country, it would have the world's 8th largest economy. So when Californians set out to reduce their GHG emissions by 80 percent below 1990 levels over the next several decades, we shouldn't underestimate the impact that will have in fighting global warming.

I applaud the witnesses here today who are taking the lead in fighting global warming on behalf of their states, cities, and communities.

What's disheartening about today's hearing is that these officials feel compelled to act in large part because the Federal Government is abdicating its responsibility. As important as all of these regional, state, and local actions are, we still need leadership from President Bush and from Congress.

We have heard from the scientists. The most recent Intergovernmental Panel on Climate Change (IPCC) makes it clear that global warming is happening and the causes are largely anthropogenic.

We have heard from enlightened business leaders who formed the Climate Action Partnership to advocate national strategies for fighting global warming.

I appreciate the fact that private sector and state and local public sector leaders are stepping in to fill the breach created by the current administration's inaction on the most pressing environmental issue of our generation. But the fact is, we need national leadership. And we need it right away.

I'm proud of what Maryland is doing to fight global warming. Several cities, including Baltimore, Annapolis, Rockville, and Gaithersburg, are participating in the U.S. Mayors Climate Protection Agreement, which commits them to voluntarily implement Kyoto agreement within their municipalities.

Later this year, Maryland will become a full partner in the Regional Greenhouse Gas Initiative (RGGI). "REGGIE," as it is known, is a cooperative effort by several Northeastern and Mid-Atlantic States to reduce carbon dioxide (CO_2) emissions from powerplants by stabilizing CO_2 emissions at current levels from 2009 to 2015, and then cutting them 10 percent by 2019.

Maryland is particularly vulnerable to the effects of global warming. Tide gauge records for the last century show that the rate of sea level rise in Maryland is nearly twice the global average. Studies indicate that this rate is accelerating and may increase to 2 or 3 feet along Maryland's shores by the year 2100.

More than 12 percent of the State's land is designated under the National Flood Insurance Program as a Special Flood Hazard Area. An estimated 68,000 homes and buildings are located within the floodplain, representing nearly $8 billion in assessed value. Allstate Insurance, one of our largest insurers, recently announced that it will stop writing new homeowners' policies in coastal areas of the State, citing concerns that a warmer Atlantic Ocean will lead to more and stronger hurricanes hitting the Northeast.

About a third of the marshes at Blackwater Wildlife Refuge on Maryland's Eastern Shore have been lost to sea level rise over the past 70 years. Smith Island, the only inhabited island community in Maryland and the subject of a recent documentary on global warming, has lost 30 percent of its land mass to sea level rise since 1850.

According to 2005 report of the Maryland Emergency Management Agency, Maryland is the 3rd most vulnerable state to flooding and has the 5th longest evacuation times during a tropical storm or hurricane event.

So we don't have a choice. We need to do everything possible to curb global warming and rising sea levels. But we can't do it alone. The Federal Government has to join us in this effort.

Thank you, Madam Chair.

From: Sen. Ben Cardin

Re: Inclusion of article on effects of global warming on Chesapeake Bay in the hearing record

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An excellent article on the possible impacts of climate change on the Chesapeake Bay ecosystem appeared in the December 2004 edition of the Bay Journal. Inclusion of this article in the record for the **State, Regional, and Local Perspectives on Global Warming Full Committee (EPW) Hearing**, provides important information on regional impacts of climate change.

The author has no objections to its inclusion in the Record.

BAY JOURNAL

December 2004

Region destined to lose ground to sea level rise at an increasing rate

By Karl Blankenship

The Chesapeake has been losing ground to the sea for 10,000 years, but the pace of sea level rise during the past century—and the projected rise in the coming 100 years— threatens to wash more than just dirt into the Bay.

Water levels have risen about a foot in the past 100 years, wiping some islands off the map, eroding shorelines and washing away ecologically valuable marshes. Sediment from that erosion clouds the water, contributing to the loss of underwater grasses.

But water levels in the coming century are expected to rise two to three times as fast, threatening not only coastal ecology, but also human development, which is moving to the waterfront.

"We're on a collision course in many ways," said Stephen Leatherman, director of the Laboratory for Coastal Research at Florida International University. "We've got a huge rush of population toward the coast."

Leatherman, one of the nation's leading experts on the impacts of sea level rise, spoke at a November conference that brought together Bay region researchers and state officials to improve their understanding of storm effects and rising water levels and to increase coordination among agencies and scientific institutions.

One impact of sea level rise was experienced during Hurricane Isabel on Sept. 19, 2003. In many areas, the storm surge that accompanied Isabel rivaled or exceeded

that of an unnamed hurricane of similar strength that followed a similar path up the Bay in 1933.

Because Bay water levels were about a foot higher when Isabel hit, it flooded areas left untouched by the 1933 hurricane.

But, Leatherman said, "Isabel was just a taste of it." People pressing to live near the Bay can expect more in the future. And as sea levels rise, the next hurricane that comes up the Chesapeake will push water even further inland.

While catastrophic events like Isabel grab headlines, the accelerated rate of sea level rise is a larger threat to coastal ecosystems, including the Bay, according to Leatherman.

Yet coastal residents and government planners rarely take rising water levels into consideration when making decisions, he said, because it seems so slow, and insidious. "These things creep up on people," Leatherman said. "We are a crisis driven society. It's easy to forget about sea levels."

Over time, the impacts can be dramatic.

Sea levels have been on the rise since the end of the last ice age, 10,000 years ago. But the pace has been accelerating. The past century has seen the total loss of some islands in the Bay, such as Sharps Island near the mouth of the Choptank River. Huge amounts of other islands have washed away. Blackwater National Wildlife Refuge on Maryland's Eastern Shore has lost about a third of its total marsh area between 1938 and 1988.

As shorelines erode, they unleash tons of sediment that smother nearshore underwater grass beds, one of the Bay's most important habitats. When grasses disappear, they no longer help to buffer the shore against wave action, creating the potential for even more erosion.

The increasing rate of sea level rise is primarily the result of warming temperatures, which cause water to expand and increase the melting of glaciers and polar ice sheets.

Ocean levels are expected to rise another two feet by the end of this century—and an increase of three feet is considered possible. The increase in the Chesapeake could be even greater because much of the land around the Bay is also subsiding.

Leatherman said that on average, a foot of sea level rise means water erodes inland by about 150 feet, but the exact distance varies by geology. In highly erodible areas like the Eastern Shore, which has fine clay soils, one foot of rise could mean water moving hundreds of feet inland, he said.

"If you are living on an island or low-lying land, you ought to think of putting your house up a little higher than you would have before," Leatherman said. He said dikes protecting some cities along the Bay will likely need to be built higher. In the countryside, farmers near the water's edge are already losing access to parts of their fields because their tractors can no longer drive over the soggy ground. "Salt marsh grasses are going to march over their fields," he said.

While it's impossible to stem erosion in an area as big as the Bay, he said efforts were warranted to buffer shorelines with underwater grass beds in highly erodible areas.

As with Isabel, the impact can by magnified by hurricanes. Right now, the frequency of hurricanes appears to be on the increase, which may be part of a natural cycle which recurs every few decades, said Hans Paerl, a professor of marine and environmental Sciences at the University of North Carolina-Chapel Hill, a speaker at the conference.

The number of hurricanes was also high in the 1930s and early 1960s. And in 1893, four hurricanes hit near Beaufort, NC, where his lab is located, Paerl said. "We may not be living in such an unusual period when we look at long-term cycles."

What has increased is the number hurricanes which become expensive natural disasters. But that increase is caused by the huge influx of people into hurricane-prone coastal areas in recent decades. "These are natural events," Paerl said. "They become disasters when people are involved."

Karl is the Editor of the Bay Journal.

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Senator CARDIN. Speaker Nuñez, I held your position in the Maryland legislature when we initiated the Chesapeake Bay program, worked first with the entities in Maryland, then our surrounding States, and then ultimately came to the Federal Government as a partner. I think we made great progress, because we tested the issues at the State level, the local level then the regional levels before coming to Washington. I think you are doing the same thing with the laws that you are passing.

The California law is now being looked at in the Maryland legislature. I expect the Maryland legislature is going to pass a bill very similar to your initiative. That is what federalism should be all about. Mayor Nickels, seven of our municipalities, a part of your initiative, including Baltimore City. So we are working together, trying to come up with a proposal that will reflect what we need in this Country.

I respect the different views that have been expressed by this panel. There are different views as to what we need to do as far as our environment is concerned. But I don't believe there is any disagreement that we need to become energy independent. We need to do that for many reasons. I think everyone on this panel would agree that for national security, we don't want to continue to give money to entities that are very much against our national security interest. Every time we fill up our tank, we are helping to support extremists who disagree with our way of life.

I don't think there is any disagreement here about the economic impact, about becoming energy independent, so we don't have to worry about OPEC countries changing the price of oil affecting our economy. I would think we would also acknowledge that becoming energy independent will be much friendlier to our environment, something that we all have sensitivity to.

So I would hope that we would frame this debate, rather than as Senator Voinovich has pointed out, there are different views here in Congress and our ability to pass legislation this year is very much compromised by that. But I don't think we can wait. States and local governments have done their job and they are continuing to do that. But there is a need for Federal action here. There is a need for leadership at the national level. We have a lot from what has been done at the State and local governments. We need, for the sake of our security, economy and environment, we need to move forward.

I would hope that we would follow some of the recommendations that we have heard from our States. They have tested these programs, they know what works, they know the economic impact. They know how businesses have been able to respond and deal with the challenges of caps and the other issues. We have that information, thanks to the good work done by your States and your municipalities.

I think it is now incumbent upon us to take a look at that and develop some national leadership, so that we can work in stronger partnership with the work that has been done here. Madam Chair, I thank you for taking us down this path. I have found this hearing to be extremely helpful. I just want to thank all the panelists for being patient and presenting your information. This will not be the last time that we are going to call upon you to help us as we wres-

tle with a national policy that I think will be good, not just for our environment, which we need to deal with, Madam Chair, I agree with you, we need to deal with our environmental risks of global warming. But it is also important for our national security and for our economic interests. I think all of us should be able to come together with the programs so the Federal Government has a more aggressive partnership in this effort. Thank you, Madam Chair.

Senator BOXER. Thank you so much.

Senator Sanders.

Senator SANDERS. Thank you, Madam Chair. This has been a fascinating and important hearing. We are one Country with States that have very different needs. While I disagree with our friends from the coal and oil producing States, I understand what you are talking about. Your economies are dependent upon that type of production, you are part of an America that has to be understood as we move, I believe, in a new direction, in the same way that I hope you understand the needs of Vermont, in a State where the weather gets 20 or 30 below zero, and we all have our needs and we work together.

It seems to me, in listening to the testimony, that what they call the lowest hanging fruit seems to be energy efficiency. I would like to hear some discussion from our local and State officials about what they are doing in terms of light bulbs, for example. In Australia, they are literally talking about banning incandescent light bulbs. The compact fluorescents are far more energy efficient. I want to hear what some of your cities and States are doing. I want to hear what you are doing in terms of moving your own transportation systems away from cars that get bad mileage, the hybrids, how far you have gone in that direction.

I know in Burlington, when I was Mayor, we passed the bond issue. The result is that despite a lot of growth in Burlington, we are consuming less electricity today than we did 20 years ago.

So let's talk about it, let's start with California. The other question for my friend in California, who killed the electric car and what can we do about that?

[Laughter.]

Senator SANDERS. Mr. Nuñez, can you start on that one?

Mr. NUÑEZ. Sure, I will start. Senator Clinton alluded to that 30-year timeframe, in which California, in terms of our per capita consumption, has been flat while the rest of the Country has actually gone up 50 percent. That is true because of the laws that we have passed over the years in California, both in the area of the protection of the environment, but also in conservation. In the last 6 years, a lot of has been done also in terms of transportation and emission standards, which now in California, you know, we drive somewhere in the neighborhood of 20 to 30 percent of the hybrid vehicles.

Senator SANDERS. Is the electric car still being discussed?

Mr. NUÑEZ. It is being discussed, but there were some problems in terms of how efficient it was to move people from point A to point B. But I think there is no question that with the new technologies that are coming to bear, there certainly is the opportunity for electrical vehicle to once again make their way back into the California market.

Senator SANDERS. OK, let me ask anybody who wants to respond, just something as simple as light bulbs. I know Senator Boxer has been talking about that for the Federal Government, just moving away from incandescent light bulbs. What your cities or States been doing? Mayor Nickels, do you want to say a word on that?

Mayor NICKELS. Thank you, Madam Chair and Senator. Our electric utility, which is owned by the city, recently gave away 13,000 of the compact fluorescent bulbs.

Senator SANDERS. Let me ask you a question, and Madam Chair, I am wondering what we could do at the Federal level. There have been some indications that if we literally gave away, gave away compact fluorescent light bulbs, we end up saving money. Is that what you are saying, Mayor Nickels?

Mayor NICKELS. They are many times more efficient, and while the initial cost is higher, they last many times longer. The payback is remarkably short.

Senator SANDERS. So do you see a potential in encouraging them?

Mayor NICKELS. Yes. In Seattle, we decided we would lead by example. So we reduced the city government's emissions first by 60 percent from 1990 levels. We did that by converting to many hybrid vehicles, we have converted our diesel to biodiesel. In fact, in my neighborhood, the local Safeway, which is the largest grocery chain, opened up a biodiesel pump at their station, first one in the Country in the Safeway chain. They are buying the biodiesel from a company in Iowa.

We have traded in the beloved mayoral Town Car for a hybrid, a tough decision, but one I thought was important. We are striving to become the green building capital of America, so that the architects and engineers and suppliers in Seattle have a chance to create jobs in those industries that we can export the services and products elsewhere in the Country and the world.

Senator SANDERS. Mayor Cownie.

Mayor COWNIE. We are doing many of the same things that Mayor Nickels is doing. Additionally, when we go out and meet with citizens, and I talk about empowering citizens, they all were sitting around, tell us what to do, tell us what to do. So we have a Just-Do-One-Thing program that we are doing, and we give them a little bag, when we go to these town hall meetings, and we put a compact fluorescent in there. We tell them it takes 18 seconds to go switch out an old one, put in a new one. We give them a whole list of other things that they can do in their households each day to make a difference.

Senator SANDERS. That is great. My time has run out, Madam Chair, but I would also say that one of the areas we want to look at as we move away from incandescent to compact fluorescents, is we don't manufacture those bulbs, I don't believe, in the United States of America. If we are talking about getting millions of people to use those bulbs, we could make some money if one of these companies would start producing these things in one of our towns.

Thank you very much.

Senator BOXER. You are so right about that. Every single one of those bulbs, because believe me, I did a survey, made in China. The irony of all this. Basically with China saying, we are not ready to do anything. But they are making these light bulbs.

Anyway, let me thank everyone so much. As my colleagues said, this has been a very long hearing for good reason. Because all of you are very provocative in what you said, and I thought Governor Corzine was as well. Colleagues are so interested, and it makes me so happy as a committee chair. It is like, what if you called a meeting and nobody came.

[Laughter.]

Senator BOXER. As you know, as Speaker, that does happen now and then. Here it is just a lot of attendance and it makes me really feel good. We even went to New Orleans on Monday for a field hearing and we had seven Senators there. So that was wonderful.

OK, so in closing this, I get a chance to say the last word, which is always hard for people who don't agree with me. But let me just say, on the question of whether global warming is occurring, it always sort of breaks my heart when people say the science is confused and so on. I would love to share with those of you who are skeptics the latest scientific reports and the bona fides of the people who have signed onto these documents. Because it is one thing to keep saying there is no consensus. I am sure there were always those who said, the earth is flat. There are still people who say HIV doesn't cause AIDS. There are even people who say there is no link between tobacco and cancer. You always have a few.

But the preponderance of the evidence on global warming is in. I just hate to see us waste time on it. I think the legitimate things that the antis said today are very important for us to hear, that please be mindful in a coal State, that if you move forward, we have to ease the burden on the consumers. Absolutely. I think that Senator Voinovich's call and Senator Clinton's and my own feelings on clean coal and a Manhattan-like project to find truly clean coal, those things are necessary. The technology piece has to go along with everything else we are doing.

But I do agree with Speaker Nuñez when he says that, if you are clear about the caps, then somehow the smart money will follow. We already see it happening with the biggest corporations coming forward and supporting us as we strive to find some common ground to become partners with those of you who have taken action. I think that is what I want to be, is a partner. I want to do things that enhance what you are doing and that allow you to still keep on going, because you are the laboratories in the best sense of the word.

So in closing, I think we could put our hands over our eyes and then over our ears and our mouths and just say, we are not going to pay attention to this. Believe me, it is a lot easier. But the greatest generation, what they did for us, our grandpas and our great-grandpas, they did it for their great-grandkids that they may never see. We have this challenge. It is not as immediately life-threatening, obviously, as what they faced. But it is life-threatening to the future.

So we can't just hide behind feel-good statements here. We have to get down and do it. I am, as I said in the beginning, an optimist. I am filled with hope. This is the greatest country on the face of the earth, Mr. Harvey, I totally agree. That is why we are up for this challenge. We can do this in the right way. I am so proud of my State, and Mayor Nickels, of what you have done, Mayor

Cownie. All of you who are grappling with this on the ground, I used to be a county supervisor. I know the buck stops right there. They have your phone number, they meet you in the street. It is hard either way, and we have to have answers.

So let's work together. I think that's the key. Let's not have these great divides, because time is clicking and it is not our friend.

Thank you very much, and this hearing has come to a close. Thank you all.

[Whereupon, at 1 o'clock p.m., the committee was adjourned.]

[Additional statement submitted for the record follows.]

STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Thank you, Madam Chairwoman. And thank you for keeping the attention of this committee focused squarely on the supremely important need to curb global warming.

Many of us here in Congress have been aware for some time that, when it comes to global warming, state and local governments have been filling the vacuum left by federal inaction. It was only in preparing for this hearing, however, that I had an opportunity to learn just how many state and local governments have taken strong steps already. Fourteen states have actually set state-wide targets for reducing greenhouse gas emissions. Twenty-nine states have completed climate action plans. Thirty-one states are involved already in regional greenhouse gas reduction initiatives. I am not sure whether the various members of Congress who still oppose federal legislation to mandate greenhouse gas reductions realize how many of their constituent businesses are already subject to such mandates. All of the businesses I talk to prefer, for several reasons, a uniform national system to a patchwork of state and regional ones. I would think the same would be true of many large employers in my colleagues' states.

Of course, creating political pressure for a comprehensive national strategy is by no means the only virtue of these local, state, and regional initiatives. For one thing, the non-federal initiatives are reducing greenhouse gases right now. For another, they are doing invaluable design and testing work—dealing with emissions registries, monitoring and compliance programs, trading markets, and offsets—that will inform the inevitable federal system. The comprehensive national system that I believe Congress will soon enact will be more effective, more efficient, and more durable because of the ingenious and courageous work that is being done today at the local, state, and regional levels.

I cannot discuss genius and courage on the issue of global warming without mentioning Connecticut. I am extremely proud to represent a state that has always been, and continues to be, a national leader on policies to reduce greenhouse gas emissions. Connecticut is a founding member of the Regional Greenhouse Gas Initiative for powerplants. In 2004, the state passed laws and issued executive orders to reduce greenhouse gas emissions across all major sectors of the state's economy. For example, those laws adopt California's automobile emissions standards, set efficiency standards for products and appliances, require greenhouse gas emissions reporting, and mandate a plan to reduce statewide greenhouse gas emissions to 1990 levels by 2010 and to 10 percent below 1990 levels by 2020. In early 2005, Governor Rell's administration submitted the plan to the Connecticut General Assembly. That document, encompassing 55 separate initiatives, represents one of the most, if not the most, comprehensive, economy-wide state plans for curbing global warming pollution. Many of the initiatives comprising Connecticut's plan are now in place and reducing emissions.

Madame Chairwoman, I could not resist the temptation to brag a bit about Connecticut's enormously productive efforts in this area. I appreciate my colleagues' patience. I am just extremely proud of my constituents and Connecticut's government.

Thank you, Madame Chairwoman.

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